



Weekly News

28 January 2022

Japan's electric utilities rush to secure spot LNG as inventories drop

Snow storms have made Japan's utilities scramble to secure spot LNG as gas-burn for power generation rises to compensate for unplanned coal power outages. One utility buyer reportedly snapped up several spot LNG cargoes for February delivery – though the JKM spot LNG price, benchmark for cargoes to Northeast Asia, last traded as high as \$18.945 per MMBtu.

Stocks held by Japan's major utilities dropped 6.9% week-on-week, according to government data, driving utilities' search for spot LNG cargoes for February or March.

Prices are not coming down, on the contrary: JKM futures for March deliverer last changed hands at \$26.005 per MMBtu on CME's platform, while the corresponding April contract settled just a tick lower, at \$27.560 per MMBtu.



Few gas buyers covered for March

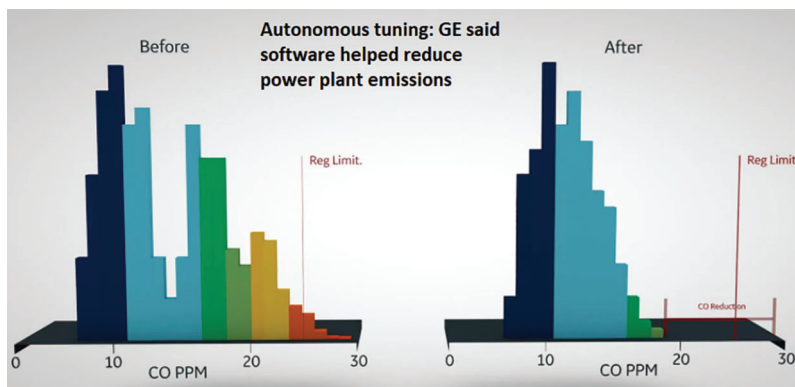
Traders reckon most Japanese buyers are trying to "avoid spot LNG" in the face of high prices. No major utility seems to have any surplus inventories as stocks had been used up early this winter. But most electric utilities are prepared and can manage their gas need

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GE's autonomous tuning tracks gas turbines' sweet spot

General Electric has launched a machine learning software that gas tunes turbines to operate with an 'ideal combustion'. Autonomous Tuning uses Artificial Intelligence (AI) to build a machine learning Digital Twin model of a gas turbine to continuously find optimal flame temperatures and fuel splits to minimize emissions, noise and fuel consumption.

As turbines require seasonal adjustment of flame temperatures and fuel splits, which is generally a manual process performed by an expert after an outage and may take a few days to complete. GE said with the new software, this turbine fine-tuning is done automatically.



Immediate adaption to changes

The software sense changes in ambient temperature, fuel properties and degradations before ad-

justing the controls every two seconds. That way, it tracks the turbines 'sweet spot' in response to changes in environmental conditions, fuel proper-

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through early February, while very few are covered for March.

Prudent players have filled their short-term gas requirements from longer ranging contracts for 2022. Others are trying to use any upward quantity tolerances (UQTs) they can exercise in their long-term contract to maximise gas deliveries.

Tight gas markets both Europe and Asia mean prices are unlikely to fall anytime soon. Most traders expect JKM forward prices will stay above the \$15-mark for most of 2022.

Shift to green fuels

Demand for natural gas from the power sector will eventually abate as JERA, Japan's largest utility, co-fired more and more hydrogen and ammonia in its combined-cycle gas power plants. Government funding has been made available for Mitsubishi Heavy Industries (MHI) verify co-firing some of JERA's thermal power stations with at least 50% ammonia at two different boiler types by 2028.

Funding for the project will be made available for an 8-year period from financial

year 2021 to financial year 2028. Within the first four years of the project, JERA and MHI have committed to develop a new burner capable of single-fuel ammonia combustion and draw up a master plan for equipment to demonstrate its use in actual boilers.

As Japan's largest LNG importer and power utility, JERA has set itself a target to reduce CO2 emissions to net zero by 2050, largely through energy efficiency measures and power plant retrofits. The government of Japan is supporting such efforts as it strives to establish a "carbon-neutral society." ■

Siemens Energy reduces FY2022 targets on Gamesa profit warning

Siemens Energy has reduced its target for fiscal 2022 as revenue from its gas and power segment fell 5.9% to €4.140 million and amid a profit warning from its Spanish wind power arm Gamesa. Management now expects FY2022 revenue to be in a range of 2% decline to 3% growth, compared with -1% to 3% in earlier guidance.

According to preliminary results, Siemens Energy made an adjusted loss before interest, taxes and amortization of €57 million (\$64.5 million) in the October-December period, compared with adjusted Ebita of €243 million in the same quarter the previous year. Analysts had expected the German OEM to make a profit of around €90 million.

Revenue falls despite higher order intake

Though orders increased 10% to €8.33 billion, Siemens Energy's overall revenue declined 11% at constant currency to €5.96 billion, down from €6.54 billion earlier.

Reacting to these figures, the Berlin-based company lowered its earnings forecast, with 2022's adjusted Ebita margin before special items forecast in a range of

2% to 4%, down from 3% to 5% previously. Siemens Energy also noted it will reassess its target for fiscal 2023' adjusted Ebita margin before special items.

The results and guidance adjustment follows a profit warning of majority-owned

Siemens Gamesa Renewable Energy. The Spanish company swung to an operating loss in the first quarter, attributed largely to continued supply constraints and the pandemic's impact on customers' investment decisions. ■



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ties, or physical degradation which reduce the need for seasonal remapping.

In field tests, power plants realized carbon monoxide (CO) reduction by 14%, nitrous oxide (NOx) emissions decreased by 10% - 14%; and fuel and carbon dioxide (CO2) reduction between 0.5 and 1%.

Applicable to any OEM gas turbine

GE underlined the software is applicable to

any OEM gas turbine platform. It is also fully bound by the turbine controls system's safety-critical programming – ensuring it cannot harm the turbine.

Electricity generators who benefit the most from this software are located in highly regulated regions or with constrained emissions, such as Europe, the United States and Canada, or in any location with changing weather patterns or fuel-quality variability issues. ■

China's electricity demand growth to fall in 2022 as economy slows

A cooling economy and high fuel prices will lower China's electricity consumption growth this year, partly reversing 2021's staggering 10.3% increase. The Asian powerhouse consumed 8,312.8 Terrawatt-hours (TWh) of electricity in 2021, data by the National Energy Administration shows and analysts expect electricity demand growth to slow to around 4.5% for the years through to 2024.

No separate data was published for 2020, when China was badly affected by the Covid-19 pandemic, but the state statistics body said electricity demand grew 7.1% on average between 2022 and 2021.

Once lockdowns were lifted in early 2021, electricity demand surged swiftly to 14.7% above 2019 levels which brought China at the brink of a power crunch and

forced the government to impose large-scale restrictions on electricity use during the final two weeks of September.

Looking ahead, analysts expect China's demand for electricity and fossil fuels will abate. The International Energy Agency (IEA) said for the years 2022-2024, China's electricity demand growth will slow to an average of 4.5%, due to efficiency improvements and slower economic growth.



Street scene in front of a Chinese power station

Switch to green fuels amid carbon pricing

The NDRC, China's top economic planning body, is reconsidering the role of each fuel in the face of decarbonisation policies. Beijing's latest policy to include the power sector into the national carbon market is meant to spark a build-out of solar and wind

power sources.

Li Yunqing, director of NDRC's Economic Operation Regulation Bureau specified plans to speed up the construction of utility-scale wind power and photovoltaic projects in remote desert regions in northwest China, and lower coal-fired power generation to 300 grams standard coal/kWh or less.

Build-out of new generating capacity in China increased 8.1% year on year to 8,112.2 TWh in 2021, data from the National Bureau of Statistics show. Growth in electricity consumption slightly outpace generation growth which caused parts of the power shortages in the past autumn.

Eager to ease constraints, the NDRC is working to increase power transmission capacity over large distances and build balancing power units to facilitating the grid integration of renewables, while managing downstream power consumption in peak hours to prevent blackouts. ■

Shell says cost of green H2 falls to \$1.40/kg as China boosts output

Green hydrogen (H2), made from renewable energy, could get three-fourth cheaper as China invests in boosting output. H2 was last trading at \$6 per kilo, but Shell Hydrogen anticipates the cost could drop to about \$1.40 to \$2.30/kg by 2030 in regions with abundant wind and solar power such as northwest China, the Middle East and Australia.

"Those regions will be able to reach a level of very attractive prices by producing green hydrogen at a level comparable to grey hydrogen today," Tobias Chen, its head of Shell Hydrogen Asia Pacific, said during the virtual Asian Financial Forum.

Cutting the cost

Today, it is still too expensive to retrofit industry and power generators to partially run on green hydrogen. Bringing down the cost hinges on technical innovation such as cheap renewable energy supply and available storage and transportation facilities.

"Despite green hydrogen technology being available, the whole value chain is still under development to commercialise the technology. The market is still in the early stage," commented Winnie Fan, managing director of sustainable finance at Bank of China (Hong Kong).

China's H2 industry body is urging the government to install 100 GW of green hydrogen electrolyzers by 2030. That staggering volume is more than the 76 GW of

electrolyzers currently in operations around the globe. But manufacturing capacity is growing fast, with Bloomberg NFE analyst expecting it to reach an annual 3.1 GW by the end of this year.

Coal gasification

Today, China is already by far the largest hydrogen producer with 25 million tons output each year, compared to a total of 70 million tons. But it is also the dirtiest H2 producer, with 62% of China's supply coming from coal gasification, which emits 18-20 tonnes of carbon dioxide for every tonne of H2 produced (compared to 8-12 tonnes of CO2 from methane reforming).

Coal gasification, instead of burning the fuel, chemically transforms it into synthetic natural gas which can then be used for generating power with a lower carbon foot-

print. "Unconventional gas and synthetic gas development will ensure fuel to expand gas- and H2 co-fired power gen capacity in China, which now takes approximately 20% of total gas consumption," said Prof. Hua Ben, director of the Natural Gas Utilisation Research Centre at South China University.

Though coal gasification can be attractive from an economic and energy security perspective, its overall carbon intensity is actually worse than coal mining. Hence the International Energy Agency (IEA) does not deem it attractive from a climate change point of view. ■



Hydrogen delivered by truck in China

EU about to publish final taxonomy proposal, could take effect in 2023

Investors are at loggerheads over the European Commission's proposed taxonomy rules, claimed to greenwash gas and nuclear. New nuclear plants permitted until 2045, as well as gas power with emissions below 270 grams of CO₂e per kWh can be classified as green. Unless vetoed down by at least 20 EU countries, the new regulation will be effective in January 2023.

Headwinds against the draft regulations come from various directions. An investor group with €50 trillion under management wants gas to be excluded from the rulebook, and both Austria and Luxembourg have threatened to sue the Commission if the proposal is passed unchanged.

Strict thresholds

The current proposal, however, only classifies gas as "green" until 2030 when plants adhere to firm emissions thresholds. Not only do direct greenhouse gas emissions need to be below 270 grams per kWh of energy output, the plant's annual emission is also not permitted to exceed 550 kilograms of CO₂e/kWh of energy output over 20 years.

New gas power stations are only considered sustainable if they replace coal power units, and operators need to demonstrate that the turbines can be adapted to co-fire green fuels like ammonia and hydrogen.

Refuting criticism, the Commission has defended its draft proposal's "clear and tight conditions" for gas and nuclear investments, which it says are needed to "facilitate the transition towards a

predominantly renewable-based future.

Awaiting final draft

Law-makers in Brussels are currently reviewing reactions received from EU member states in a consultation process. "We will be coming forward with a fresh proposal as soon as we can," commission spokesperson Eric Mamer told a press briefing this week. "We need a bit of time to analyse the reactions that have been received."

Once the Commission publishes a final proposal for the rules, they could take effect from January 2023, unless vetoed by a supermajority of EU member states. However, the scheme can only be stopped if at least 20 EU countries oppose it, which is unlikely as France and Poland want new small-scale nuclear reactors and Germany more flexible gas generation.

French-German spat

Germany's new government struggles to align the financial sector with more stringent emission reduction targets while adhering to European guidelines. Though the Green Party – now part of Germany's ruling coalition together with the Social Democrats and

the Liberal Democrats – clearly opposes new nuclear power but may be willing to compromise if Brussels will also classify investment in new gas-fired power stations as "climate friendly", at least for an interim period. Gas will be vital to help Germany avoid energy shortages in the face of the nearly simultaneous exits of coal and nuclear.

France, as well as several Eastern European countries, want to build a series of small-scale nuclear reactors to ensure stable electricity supplies as markets need to absorb growing volumes of inherently intermittent electricity from wind and solar PV installations.

Most Germany policy makers, in contrast, oppose such proposals and remains committed to its unilateral exit of nuclear energy. The Atomic Energy Act stipulates that the last reactor generating electricity in Germany will have to shut down by 2022 at the latest. ■

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NEWS NUDGES

GenCell raises funds

Israel-based fuel cell maker GenCell Energy has raised \$35.9 million in its latest funding round. CEO Rami Reshef said the fresh capital will accelerate developments in the field of green ammonia, pursued with TDK, as well as charging stations for electric vehicles.

H2-powered plant for French Guiana

Siemens Energy will set up a hybrid plant to supply stable baseload electricity to 10,000 households in French Guiana. An intelligent combination of 55 MW photovoltaics, an electrolyser to produce green hydrogen, fuel cells and energy storage is scheduled to be commissioned in the autumn of 2023.

Oman inaugurates 500 MW solar plant

ACWA Power has inaugurated Ibri 2, an \$417 million solar power plant with a capacity of 500 MW. The large IPP will sell solar power to Oman's national grid over a 15-year period, backed up by flexible gas power plants.

Equinor submits plans for H2H Saltend to gov's phasing competition

Plans for H2H Saltend, Equinor's 600 MW hydrogen production with carbon capture, have been submitted into the UK government's cluster sequencing process. Six industrial operators back the project: Centria Storage, INEOS Acetyls, Pensana, Triton Power, Vital Energi and Vivergo Fuels. Application for H2H Saltend is now in phase-2, with results expected around May 2022.

Notorious air pollution in the Humber region could be reined in soon: H2H Saltend will enable industries at Saltend Chemicals Park and the East Yorkshire area to reduce CO2 emissions by nearly one million tonnes annually, equalling 30% of Saltend Chemical Park's total current emissions.

The six industry partners each embrace hydrogen to reduce their carbon footprint:

- Centrica wants to switch from gas to hydrogen to reduce its emissions at the



Saltend Chemicals Park

Easington gas storage site in East Yorkshire. INEOS Acetyls seeks to use hydrogen instead of fossil fuels within its processes to produce lower carbon chemicals.

- Persana is setting up the UK's first sustainable rare earth processing facility at Saltend, where it will use hydrogen for processing end-of-life magnets in order to recover and reuse parts of the critical rare earth supply chain.
- Triton Power, the operator of the Salted Power Station, will partially switch fuel from natural gas to hydrogen to accelerate the decarbonisation of electricity supplied to the region.
- Vital Energi, service provider for the proposed Yorkshire Energy Park, will use hydrogen within its electricity generation, heating and cooling.
- Vivergo Fuel will blend the bioethanol it is producing with petrol to create E10 fuel, when the plant reopens in early 2022. Working with Equinor, it will assess

whether H2 can be used as a low-carbon alternative to natural gas within the drying of its co-produced animal feed.

"H2H Saltend will provide low carbon hydrogen to multiple industries in the Humber by 2026, and the demand for this is clear from the industrial operators' agreements we already have in place," said Irene Rummelhoff, Vice President for Marketing, Midstream and Processing at Equinor. For northern England, it is a major step to a wider hydrogen economy which can reduce emissions across several sectors, and act as a catalyst for greater inward investment and growth.

The Norwegian oil and gas company Equinor has also submitted three other projects into the UK government's phasing competition: Two carbon capture power stations at Keadby and Peterhead, both developed together with SSE Thermal, as well as the Net Zero Teesside Power project which is developed in partnership with bp. ■

Germany eyes importing blue hydrogen from Norway

Blue hydrogen, imported from Norway, could help Germany bridge a transitional period until a full supply of green, carbon-neutral hydrogen becomes available. "We can continue to deliver gas and hydrogen but with the carbon stored away safely," Norway's prime minister Jonas Gahr Store said, referring to ample potential for CCS in depleted oil fields under the North Sea.

The Norwegian PM has invited the German energy and climate secretary Patrick Graichen to join his country's plans for CCS on a large scale. Norway is a long-standing exporter of pipeline gas to Germany and wider Europe, and imports of blue hydrogen are meant to expand the country's cooperation in the energy transition.

Graichen said the German government will not stand in the way if private investors decide to import blue H2, which is cheaper but has residual emissions, and use it in pipelines planned for green H2. "Blue hydrogen for a transitional period in pipelines planned for green hydrogen is fine," he noted, though the ultimate goal is reaching Net Zero through renewables, energy storage and green hydrogen.

RWE calls for strategy on hydrogen transition

Urging policy makers to clarify Germany's transition of hydrogen and green fuels, RWE CEO Markus Krebber suggested fossil gas

can only be a bridge to a decarbonised electricity supply in Germany. "As an energy supplier, we have no desire to have the discussion we are having about coal today about gas again in ten years' time," he underlined.

The head of RWE – Germany's largest power provider – estimates the country will need to build 20-30 GW of new gas-fired capacity to keep the lights on in the event of low wind and solar power availability. Today, peakload power is mostly provided by lignite and hard coal – but that most of that capacity is meant to be phased out by 2030.

To future proof new-built gas power plants, they have to be capable to co-fired hydrogen. Most turbine manufacturers are getting their equipment ready to combust at least 30% hydrogen.

Green H2 imports not enough to meet target

Critics warn Germany's hydrogen ambitions



are aspirational as it will not be able to import enough renewable hydrogen to reach the targeted 76 - 96 TWh by 2030, as laid out in the national hydrogen strategy. "The problem is that expansion of renewable energies in countries like Chile, Morocco, Spain and the Netherlands is progressing only slowly," said Malte Küper, analyst at the German Economic Institute (IW).

One key issue is that the transport of large quantities of hydrogen by pipeline or ship is still being developed or approved and cannot be implemented quickly enough. "We are talking about enormous quantities that will be needed in a short time," said Küper, who co-authored the study. ■



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Aggreko completes Middle East's largest flare-gas-to-power project

Glasgow-based Aggreko has completed commissioning of the largest flare-gas-to-power project in the Middle East to date, at 165 MW capacity. Situated nearby the Saqala field, Garmain block in Kurdistan, the modular power plant has run at full capacity for 72 hours in its final site acceptance test, marking on-time, on-budget delivery.

The plant is run on approximately 40 million square cubic feet per day (scf/d) of associated petroleum gas from the Saqala field, saving 840 tonnes of CO₂ per day, and cutting flaring by a third.

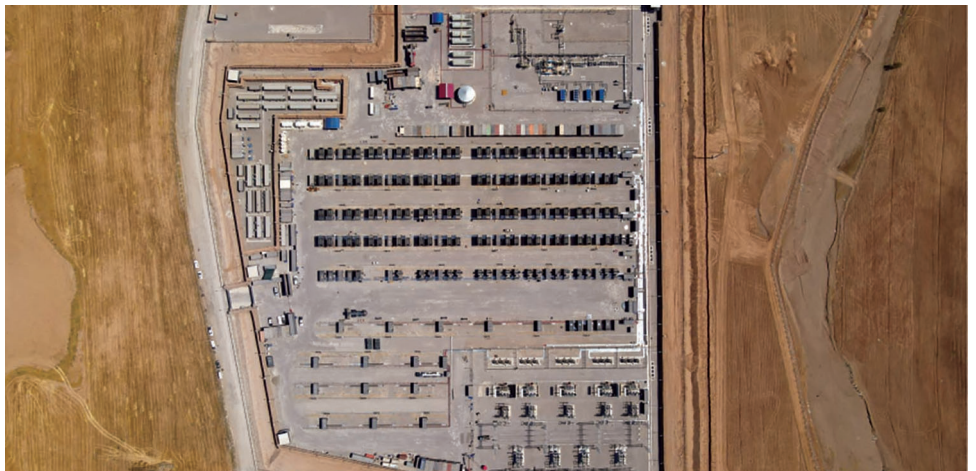
Contracted to run four years, is designed to deliver continuous baseload power. Built using 192 MW of modular gas generators, the plant can easily be scaled up or down in response to changing gas volumes.

Delivered and installed against the backdrop of the pandemic, Aggreko executed the project in close collaboration with Kurdistan's ministry of natural resources and ministry of electricity. First, it delivered a new 6 kilometre gathering pipeline to transport the associated petroleum gas to the power plant. Then, it upgraded 7 kilometres of 33 kiloVolt (kV) and 33km of 132 kV overhead cables to new high tensile low sag (HTLS) conductors for the local distribution grid to handle the new power plant's full output.

Ahmed Mufti, Kurdistan regional government's Deputy Minister of Natural Resources said, "We worked with Aggreko to provide a creative solution to convert flare gas to power in a way that directly benefits the local population and the region in general, while creating a positive environmental im-

pact and improving air quality."

Approximately 60 Aggreko engineers have delivered the project, with 80 local jobs created for the site's delivery and ongoing operation – including 44 locals who have embarked on an Aggreko-led trading scheme.



Drone view of the Saqala project in the Kurdistan region of Iraq

Wärtsilä to supply 110 MW flexible gas power plant to Italy

Gencogas, the company managing power plants for the Italian utility A2A, has contracted Wärtsilä to supply a 110 MW gas-fuelled power plant to Cassano d'Adda near Milan. Powered by six Wärtsilä 50SG engines, it is meant to receive capacity payments upon operational start in early 2023.

To that end, A2A Gencogas participated in the auctions for Italy's Capacity Market scheduled to commence in 2022. The system will remunerate power plant operators for making available flexible generating capacity at

short notice, if and when required by the grid operator Terna to balance inherently variable renewable energy infeed.

Wärtsilä will deliver and install the 110 MW plant on a full EPC basis in partnership with the Italian engineering group Cefla.



Wärtsilä 50SG engines

Once commissioned, it will be the largest power plant in Italy running on gas-fuelled internal combustion engines. These engines, such as the 50SG, can fast-start and ramp up swiftly. They will balance the growing contribution of volatile wind and solar power as Italy undertakes its 2030

national energy, climate, and decarbonisation plan.

"Italy is on its journey toward a more sustainable energy system. Wärtsilä's technology provides the thermal balancing needed to support this transition, and is best-in-class for power optimisation. We offer a future-proof solution that, along with the high efficiency and reliability of the Wärtsilä engines, supports the customer in decarbonising its operations," said Kenneth Engblom, Wärtsilä Energy's Vice President, Africa and Europe.

Recent orders for Wärtsilä in Italy include a contract by Metaenergiaproduzione to supply six flexible power plants with 380 MW output combined. All in all, to date the Finish OEM has delivered 1,411 MW power generation capacity to Italy, of which 709 MW are covered by long-term service agreements.

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