



Weekly News

12 March 2021

Developer of Australia's Equus project eyes transcontinental pipeline

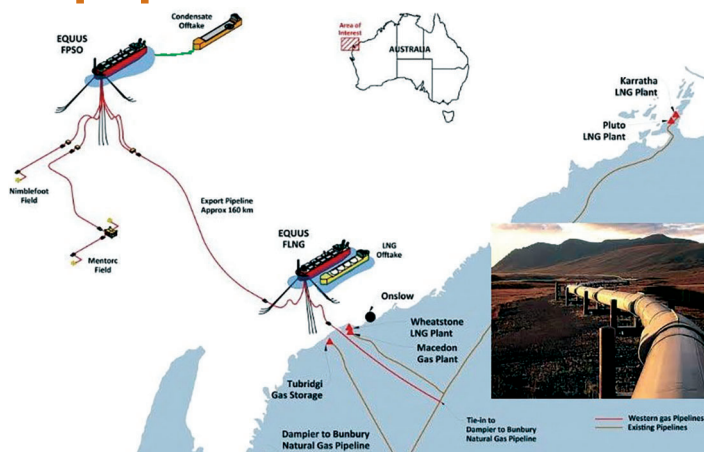
Western Gas is re-examining the idea of delivering natural gas from its Equus project in Australia at competitive prices to the East Coast via a transcontinental pipeline. The feasibility of that pipeline is being examined together with the infrastructure company APA Group, comparing the cost of transporting gas by pipeline in to LNG shipments.

The Equus upstream project consists of 11 gas and condensate fields, situated about 200 kilometres north-west of Onslow and nearly 1,400 km north of Perth. According to a Memorandum of Understanding (MoU), signed between Western gas and APA Group, the two companies will compile a joint development and marketing study for supplying Equus gas project in Western Australia through a trans-continental pipeline to the East Coast.

The study will form the basis of a bankable feasibility study, APA noted. The company operates 15,000 kilometres of gas pipeline assets in mainland Australia, and is interested in assessing the development, commercial, marketing and regulatory aspects of a transcontinental gas pipeline project.

Domestic demand vs. LNG exports

Analysts take great interest in the feasibility study of a transcontinental gas pipeline, as it opens up a discussion about prioritising part of Australia's gas bounty for domestic use and also about



Western Gas hopes the Equus development could help underpin a transcontinental pipeline

tapping some of the country's biggest undeveloped gas reserves.

These finds are the northern coast of Western Australia, notably in the Canning Basin which spans over 400 square kilometres, twice the size of the Permian Basin in the US. More nearby proven reserves are the Carnarvon Basin which holds estimated tight gas resources of 74 trillion cubic feet (Tcf) and that an additional 70-150 Tcf of shale gas – equal to the entire U.S. Marcellus Shale.

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Black & Veatch retrofit Long Ridge CCGT to run on hydrogen blend

US engineering company Black & Veatch has been selected by Long Ridge Energy Generation to retrofit its 485 MW combined-cycle power plant to run on a blend of natural gas and carbon-free hydrogen. Long Ridge has been working to reconfigure the plant's GE H-class turbine to hydrogen co-firing right after it began commercial operations in August 2021.

The Hannibal, Ohio-based CCGT initially will burn 5% hydrogen by volume in the natural gas stream. The program is outlining the changes necessary to transition entirely to using 100% green hydrogen – produced by electrolysis that separates water into its oxygen and hydrogen elements – over the next decade.

Ultimately, Long Ridge is meant to generate carbon-free baseload power. To facilitate the fuel switch, Black & Veatch will contribute its expertise in integrating hydrogen in the combustion process while ensuring safe, reliable industrial practices at the site.

"As the number of companies with carbon-free energy goals continues to grow, we decided to make Long Ridge the first in the U.S. to burn hydrogen in a large gas turbine. We want to accelerate the tran-



sition to hydrogen as quickly as possible," commented Long Ridge Energy's President, Bo Wholey.

Once completed, the Long Ridge Energy Generation Project will be among the world's lowest emission baseload power plants of any type. The 445 MW plant will form the center of a low-carbon industrial complex in Ohio that will sell power to on-site tenants and third parties seeking to decarbonize and balance their power resources.

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Government may underwrite the project

Realising a trans-continental pipeline would help solve gas supply shortages at the Australian East Coast, and would limit the amount of LNG exported from the Equus project through the Chevron-operated Wheatstone LNG plant is located. As of late, market observers suggested that the Australian Federal Government would be prepared to underwrite the pipeline with cost estimates of at least A\$5 billion (US\$3.8 billion).

Some advocates of the Trans-Australian pipeline said it could pass through the Kimberley region, given that the Federal Government first commissioned an economic feasibility study of an West-East pipeline already 2017, under then Prime Minister

Malcolm Turnbull. At the time, however, the study concluded that the high cost of a pipeline and the volatile gas prices on global markets presented an "unacceptable risk for a government to underwrite." This perception may have changed by now.

Expectations of tighter gas supply

Western Gas said it is considering developing the Equus fields via a 210-kilometre offshore pipeline to the Ashburton North Strategic Industrial Area (ANSIA). Once built, the offshore pipeline could lead to the development of other stranded gas resources and feed additional gas into the proposed West-East pipeline.

"We are delighted to be working with APA Group to advance an Australian re-

source for supply to Australian markets at an affordable price," said Andrew Leibovitch, Executive Director of Western Gas.

"Expectations are that gas supply will tighten in East and West Coast markets from the mid-2020s in the absence of the development of new gas fields" he outlined, noting: "Equus has the opportunity to meet those market needs, as well as create new gas supply opportunities independent of LNG-focused developments."

Western Gas in November 2017 acquired the Equus project from US energy company Hess Corp. which had previously sought to establish a third-party LNG production arrangement for its upstream assets in Western Australia with Woodside Petroleum, operator of North West Shelf LNG. ■

Merkel calls for renewables expansion, also in heating sector

The German Chancellor Angela Merkel has urged industry and private households to do more to expand the renewable energy rollout, especially in the heating sector where the most energy is still produced from fossil fuels. Speaking at a VKU event, she called the 46% renewables share in the power sector "remarkable" but looking at 2030 this was "not yet enough."

"We are phasing out nuclear energy and coal power step-by-step and must further expand the path for renewable energies," Merkel said at the 2021 VKU Verbandstagung, the annual gathering of the German municipal utilities association.

Apart from power generation, the Chancellor singled out heating as a key focus of the government's future decarbonisation effort. Currently more than half of total energy consumed in Germany is for process, room and water heating, and over 80% of this electricity is derived from fossil fuels.

Hydrogen – promoted as a "climate-friendly" alternative fuel

"We still have a lot of work ahead of us to

build and expand heating grids, which can then be supplied with renewable energy," said Merkel, and added that hydrogen – "aside from the bridging technology natural gas" – could be a climate-friendly alternative in the sector. "With new infrastructure, hydrogen technologies could be versatile, in heating, but also in mobility and later in industry production," she stressed.

Green hydrogen, produced via electrolysis using wind and solar power, is increasingly seen as a key pathway to decarbonise power generation, heating and also the transport sector.

Today, roughly 50% of the Germany's 40 million homes are heated with natural gas, a 25% with oil and almost 14% with district heating, largely derived from gas- and coal-fired cogeneration plants. A small share of households is supplied with heat through electricity, heat pumps and biomass and only a fraction obtains space heating from geothermal energy and solar PV.

An impulse paper, published by the German economy ministry comes to the conclusion that hydrogen would "only play a

minor role in de-central heating supply," although it might be used in certain situations in combined heat and power (CHP) facilities. In contrast, hydrogen is expected to "play a much bigger role in industry and transport."

Altmaier sees bigger role for hydrogen in industry and transport

The CDU/SPD coalition government is currently debating whether to increase the 2030 renewable energy target. A decision is meant to be reached by the end of March – based on updated assessments of the country's future energy needs which will largely depend on how fast the energy-intensive industry will recover from the Covid-19 pandemic.

Economy minister Peter Altmaier, speaking at the VKU conference, reiterated he is "ready to push the expansion of renewable energies a good bit further," but only if the cost for this is financed through the federal budget. The renewables levy – paid by power consumers and used to finance the expansion until now – "should be phased out," he underlined in a move designed to ease the cost burden for the industry. ■

Gas to Power Journal

Publisher
Stuart Fryer

Editor
Anja Karl
Tel: +44 (0)7733 684 682
anja@gastopowerjournal.com

New Business & Databases
Stephan Venter
Tel: +44 (0) 207 017 3407
venter@gastopowerjournal.com

Subscriptions
Margarita Tokere
Tel: +33 (0)7 67 62 58 77
margarita@gastopowerjournal.com

Layout & Production
Vivian Chee
Tel: +44 (0) 208 995 5540
chee@btconnect.com

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"Balanced energy portfolios that maximize the use of next-generation, emissions-free fuel sources such as hydrogen will be critical to managing the energy transition and 'repowering the power industry,'" said Mario Azar, president of Black & Veatch's power business. "The first-of-a-kind Long Ridge project represents a significant step

for the U.S. power industry and reflects the growing place for hydrogen as an important pillar of the global decarbonization effort."

As part of the project, Long Ridge has also partnered with New Fortress Energy's new Zero division, which is focused on investing in and deploying advancing hydrogen production technologies. ■

Supply risk makes UK T-1 capacity auction clear at record price

The risks of large-scale UK power generation units not being operational next winter prompted a rise in National Grid's procurement target in the latest T-1 capacity market auction. This, in turn, pushed up the clearing price in Round 6 of the T-1 auction for deliver year 2021-22 to a record price of £45 per kW.

One such driver of the higher procurement target came from Severn Power and Sutton Bridge combined-cycle power stations, which unexpectedly entered into a "dormant" state in summer 2020 when its owner Calon Energy went into administration," commented Tim Dixon, wholesale team lead at the consultancy Cornwall Insight. At the same time, several prolonged outages have been observed at several nuclear power plants.

With a tighter auction, analysts anticipated a high clearing price would happen should certain power plant, particularly coal, be able to exit the auction early. "The provisional results showed this to be true, with EDF's West Burton A coal units failing to secure agreements, with the company saying it will now consider all options for the station," Dixon said.

To help fill the gap that some of these coal units left, several new-build solar and onshore wind power units, natural gas-fired plant, battery storage and waste-to-energy sites secured capacity agreements in the T-1 action, in addition to plenty of exiting power generation capacity.



Calon Energy power station at Sutton Bridge

Capacity auctions – a missed opportunity for energy storage

Critics say the Capacity Market auctioning scheme is a "missed opportunity" to support new storage technologies. Throughout the years, the capacity remuneration mechanism mostly supported existing coal- and gas-fired power station – very little went to new-build assets, let alone green ones.

Energy Minister Ed Davey had previously talked up the possibility of energy storage companies competing in the auctions, but last

minute changes and additional requirements meant that no real storage capacity was ultimately procured through the auction process.

"We have to jump through certain hoops. Those burdens of actually accepting a contract, we think, are higher than the value of the contract," Dave Holmes, director of Quarry Battery Company said. "The benefits brought to the system by storage are much greater than the benefits felt by the one who built the storage – which is evidence of a broken market," he suggested. ■

US gas production down 1% in 2020, despite growth in Appalachian

Natural gas production across the United States has fallen by 1% over the course of 2020, despite rising output from Marcellus and Utica Shale where production kept growing despite low regional spot prices. Within the Appalachia region, West Virginia saw the largest rise in gas production, up by 1.2 billion cubic feet per day (Bcf/d), or 20%, to reach 7.1 Bcf/d.

Overall US gas production, measured by gross withdrawals, averaged 111.2 Bcf/d in 2020, according to government statistics. The output was down 0.9 Bcf/d from 2019 levels as drilling activity declined sharply due to the fall in global oil and natural gas during the pandemic.

The 2019 record-high gas production had left storages well-filled and added a bearish element to prices. Starting from March 2020, however, warmer-than-average weather along with the demand destruction due to Covid-19 related lockdowns drove down natural gas prices to unprecedented lows.

The lowest average monthly U.S. natural gas production volume was in May 2020 at 106.4 Bcf/d, according to figures by the US Energy Information Administration (EIA). But by December 2020, natural gas production had increased to 113.0 Bcf/d.

Non-oil directed wells more profitable

Comparatively cheap wellhead costs kept production going in the Marcellus and

Utica/Point Pleasant shales of Ohio, West Virginia, and Pennsylvania – in the face of low regional natural gas spot prices.

The basis price at the Waha Hub, located in the Permian Basin, was wide throughout 2019: Waha prices reached nearly \$3.00/MMBtu lower than Henry Hub prices in April 2019, according to EIA figures. In contrast, the basis price at Dominion South, situated in the Appalachian Basin, stayed rangebound in the first half of 2020 compared with pre-year levels. Analysts noted this is because the Appalachian Basin has

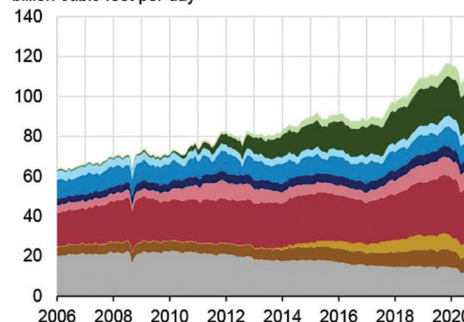
less oil-directed drilling than the Permian.

West Virginia staged 20% rise in output

Shale gas production in Ohio, West Virginia, and Pennsylvania increased from 32.1 Bcf/d of natural gas in 2019 to 33.6 Bcf/d in 2020 – regardless of the coronavirus health and economic crisis. West Virginia staged the largest rise in production, up by 1.2 Bcf/d, or 20%, to reach 7.1 Bcf/d, while gas output rose by 1.0 Bcf/d in Pennsylvania and fell by 0.7 Bcf/d in Ohio.

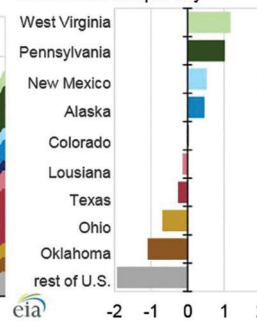
In contrast, Oklahoma saw the gas production falling by 13% to an annual average of 7.6 Bcf/d. Texas remained the largest gas producing state, although the state's output fell by some notches to 28.1 Bcf/d in 2020. ■

Monthly U.S. natural gas production (2006–2020)
billion cubic feet per day



Source: U.S. Energy Information Administration, *Monthly Crude Oil and Natural Gas Production Report*
Note: Natural gas production is measured as gross withdrawals.

Annual change (2019–2020)
billion cubic feet per day



MAN to replace diesel with green fuels in marine and power sector

MAN Energy Solutions strives to use climate-neutral fuels such as e-methane to replace marine diesel, or HFO and natural gas in the power gen sector. "By 2030, sustainable technologies should make up the majority of our company's business," said Uwe Lauber CEO of the Augsburg-headquartered manufacturer. However, a global CO2 price is vital for the marine and transport sectors to truly embrace green fuels.

E-methane can be made out of CO2 waste gas from power plants or cement kilns by synthesising it with hydrogen. Alternative green fuels for marine and power generation include ammonia, biogas or hydrogen, each requiring different storage tanks. This complicates the matter as port operators are not willing to spend much on various new storage tanks, as long as the green fuel is

not in great demand by the industry.

Call for global CO2 price

"The necessary investments in port infrastructure are significantly greater than in engine technology," explained MAN's chief engineer Gunnar Stiesch. In his view, the switch to climate-neutral fuels will not happen as long as marine diesel remains as cheap as it is today. "We therefore have to price CO2 emissions, and do so globally" he underlined.

The German government is keen to clean up maritime transport, as well as road transport, to avoid breaching the country's climate goals. The European Parliament has

already voted in favour of including ship operators in the CO2 emissions trading system (ETS) from January 2022.

LNG seen as "bridging fuel"

Today, most container and dry bulk ships as well as tankers run on heavy oil, though some newer models have been retrofitted use LNG instead. Observers say LNG serves as a necessary bridging technology to a decarbonised shipping sector, as alternative hydrogen-fuelled drives are unlikely to be commercially ready in the near-term future.

In the long run, the best way to decarbonise freight shipping would be to combine electric propulsion with synthetic fuels, a study by the University of Manchester found. Researchers examined a range of alternative fuels and found most are compatible with modified internal combustion engines when blended, particularly for larger vessels. The most promising clean fuels include ammonia, LNG, methanol and ethanol, liquid hydrogen, biodiesel, straight vegetable oil and bio-LNG. ■



Rotterdam, Europe's biggest and busiest port

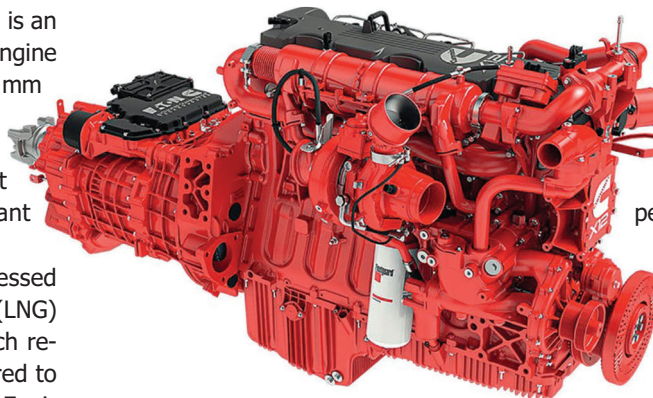
Cummins launches heavy-duty power train for gas customers

Cummins and Cummins Westport have announced the launch of the ISX12N+Endurant HD N powertrain for heavy-duty customers, combining a near-zero emissions gas engine and the Endurant HD N 12-speed automated transmission from Eaton Cummins. The solution is designed for lower emissions of regional haul fleets.

Technically speaking, the ISX12N is an inline, 6-cylinder, spark-ignited engine with bore and stroke of 130×150 mm and a displacement of 11.9 L. The engine is available with a rating of 400 horsepower and 1,450 lb-ft torque, when paired with the Endurant HD N automated transmission.

It can operate with 100% compressed natural gas (CNG), liquid natural gas (LNG) or renewable natural gas (RNG), which reduces NOx emissions by 90% compared to the current standards set by the US Environmental Protection Agency (EPA). When running on RNG, the system can achieve neutral or occasionally negative carbon index.

"The ultra-low emissions of the ISX12N combined with the Endurant HD N transmission provides the optimal powertrain solution for customers working to lower their carbon footprint," said Thomas R. Hodek,



Cummins ISX12N gas engine

President of Cummins Westport. "The deep powertrain integration delivers improved launch, low speed maneuverability, and smoother shifts that drivers will appreciate."

Mr Hodek explained the new Endurant HD N transmission has been optimised to integrate the ISX12N gas engine. It features a

new diaphragm spring clutch to meet the load requirements of the gas engine.

By integrating the engine and transmission devices, the operator can achieve a higher launch performance, improved low-speed manoeuvrability and smoother shifts when compared to previous natural gas engines and automated manual transmission combinations, according to Cummins.

Headquartered in Columbus, Indiana, US, Cummins Inc. designs, manufactures, distributes and services a broad portfolio of power solutions. It earned about \$1.8 billion on sales of \$19.8 billion in 2020. The joint-venture Cummins Westport Inc designs, engineers and markets 5.9 to 12 liter spark-ignited natural gas engines for North American commercial transportation applications such as trucks and buses. ■

Marubeni invests in Estonian energy storage developer Skeleton

Marubeni Corp has invested an undisclosed amount in Skeleton Technologies Group, an Estonian developer of ultracapacitors for energy storage. The move is in line with Japan's 2050 net zero emissions by target, whereby energy storage will be used to power electric vehicles and stabilize the grid when linked up with hydrogen-based generators or fuel cells.

Ultracapacitors are used as energy storage in various industries like automotive, transportation, construction machinery, electric power, and industrial machinery. Their high-power density, high-speed charge/discharge, long life, safety, and recyclability, make them especially attractive as a backup for decentralized power gensets.

Skeleton, as the largest ultracapacitor manufacturer in Europe with R&D facilities in Estonia and Germany, currently supplies its products mostly to clients in the auto-

motive and power gen sector in Europe and the U.S. The company is currently developing new products – with a higher energy density and a more efficient energy usage at a lower cost – that can be used as an alternative to lithium-ion batteries and lead-acid batteries, or by being combined with fuel cell systems.

Through the investment, Marubeni will have access to Skeleton's technology and in return it will help the Estonian company to sell its ultracapacitors in Japan and other Asian countries. Marubeni said it wants to

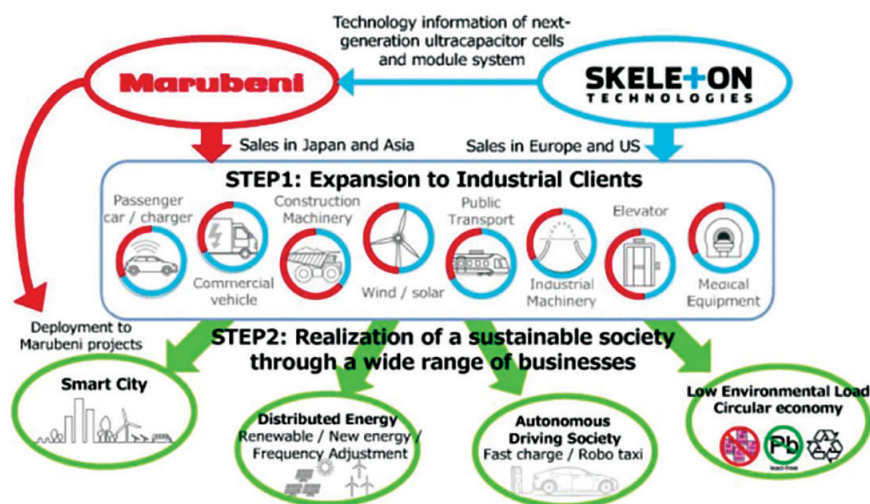
"contribute to (...) the realization of a decarbonised, sustainable society by enabling the creation of new business models, such as Smart City, decentralized and renewable new energy solutions, and autonomous vehicles."

Trial runs for ammonia co-firing

The goal of decarbonised society is also served by switching from fossil to greener fuels, like hydrogen and ammonia. In this context, Marubeni in October 2020 started trial runs for ammonia co-firing. The technical study was finalized in February 2021 and entailed a series of trials for direct usage of ammonia as a fuel in JERA's thermal power plants.

During technical trials, researchers from Marubeni and IHI Corp will be also scrutinizing the economics of equipment cost, operational expenses as well as the cost for producing and transporting ammonia to the power stations.

JERA, Japan's largest LNG importer and power producer, is looking to raise capital to retrofit its existing fossil power plants with the novel ammonia co-firing technology, once ready for commercialization. To this end, it is allowing researchers to carry out tests and trial runs at some of its thermal power plants.



Wärtsilä floating energy storage aids Philippine utility balance the grid

Therma Marine, part of the Philippine energy company Aboitiz Power, has ordered a barge-mounted 54 MW/32 MWh energy storage system to be delivered by Wärtsilä on an EPC basis. The barge will be placed next to TMI's existing 100 MW thermal power barge in the municipality of Maco, with delivery scheduled to be completed in the fourth quarter of 2021.

The project with Aboitiz Power is based on ten Wärtsilä GridSolv Max systems and will be the first ever deployment of a floating energy storage solution in the South East Asia region. Once up and running, it will provide flexibility for TMI in their ancillary service contract with the Philippine national power grid.

GridSolv, Max Wärtsilä's energy storage system, is designed to streamline installation and integration of various power generation assets to increase the energy density and system reliability. The architecture supports both stand-alone energy storages as well as hybrids systems that combine thermal with wind and solar power gen assets.

"Wärtsilä will meet our urgent needs with this unique floating energy storage barge.

Their ability to deliver this first-of-a-kind solution in less than 12 months is, to say the least, impressive," said Emmanuel V. Rubio, Aboitiz Power CEO.

"It is important to note that Wärtsilä is the sole EPC provider for this kind of a project," explained Kari Punnonen, the company's business director for Australasia. "The alternative would be to have one supplier for the barge and another for the energy storage system, which would require a lot of coordination and would undoubtedly slow the final delivery considerably."

Headquartered in Helsinki, Finland, Wärtsilä

has a total number of 26 power barges installed globally, with a total power output of 1,500 MW. A floating power barge enables fast supply of electricity to areas with limited infrastructure. As a mobile asset, the barge can be easily relocated or traded with third parties, if needed.



Render of Wärtsilä's floating energy storage

The background of the advertisement is a photograph of a man, Ciector Whitelock, working in a power plant. He is wearing a blue hard hat with a headlamp, safety glasses, and large earplugs. He is dressed in a light-colored, short-sleeved button-down shirt. He is standing next to industrial machinery, with his right hand resting on a large red handwheel of a valve. The background is slightly blurred, showing the complex piping and structures of a power plant.

"Our Atlas Copco fuel gas boosters provide us with the reliability and peace of mind we need to keep our power plant running."

Ciector Whitelock
Maintenance Manager
Astoria Energy, New York City

For more than 25 years, Atlas Copco Gas and Process has helped plant operators around the world handle the pressures that come with running their power generation facilities. Our standard and customized compressor solutions cover the entire range of Fuel Gas Boosting applications and readily adapt to the changing conditions in your plant.

Our experts will partner with you from day one to develop a solution to help you save OPEX while reducing your environmental impact, and our worldwide Aftermarket services team is here 24/7 to continue to help reduce your downtime.

Learn more about how our range of Fuel Gas Boosting solutions can help your plant at www.atlascopco.com/powergen

Some 6 GW from decentralized INNIO engines helped avert EU blackout

A sudden and critical drop in electrical frequency brought the EU power grid at the brink of collapse on January 8, 2021, when grid operators had to split up Europe's integrated power system to avert widespread blackouts. Some 4,000 flexible, fast-start Jenbacher gas engines helped TSOs to regain grid frequency within a few minutes.

A frequency deviation from the normal 50 Hertz is a highly precarious situation and can, in extreme cases, lead to a large-scale and lengthy power failure known as a "total blackout." To prevent this from happening, Transmission System Operators (TSOs) have put in place automated security systems that can be dispatched at short notice. On January 8, these emergency gensets were used and quickly ramped up reserve capacities, e.g. open-cycle gas peaking plants alongside demand-response and other grid stabilizing measures.

Jenbacher gas engines, deployed in multiple key locations of the European power grid, jumped in and supplied emergency power to help avert a cascading blackout. "Because of the recordings made by our myPlant Asset Performance Management System, we know that at the time of the near-blackout in January 2021, almost 4,000 Jenbacher gas engines played a role in stabilizing the European grid," said Andreas Kunz, Chief Technology Officer at INNIO.

"The engines responded to the frequency change within a few milliseconds," he said, underlining their contribution to averting a damaging blackout by feeding around 6 GW into the European grid. INNIO, a former GE entity, is known for its Jenbacher and Waukesha product brands. The company's range of gas engines generates 200 kW to 10 MW of power for numerous industries globally.

Rising deployment of intermittent wind and solar power sources throughout Europe places a rising strain on grid operators. To pre-empt the growing blackout risk, TSOs need reliable power sources – both centralized large-scale power plants and decentralized power plants – that can be called upon at any time to make up any shortfalls.

Trend towards decentralized, clean energy

"Decentralized energy supply, e.g. based on cogeneration systems, has a key role to play in securing the electricity and heat supply across Europe in the decades ahead," Kunz said. In the short and medium term, that means gas power plants that operate on natural gas but these units can and need to be made CO₂-neutral by running them on biomethane or hydrogen.

Small-scale gas gensets that form part of a decentralized supply system are particularly well-suited to rapid start-up and load balancing in the event of fluctuations in consumption levels, Kunz said, suggesting this fact will gain importance as the electrification advances, e.g. of road traffic.

Jenbacher gas engines are prepared for the "clean fuel switch" since they can run on fossil fuel gases (natural gas or liquefied petroleum gas), on renewable gases (biogas or biomethane), or on up to 100% green hydrogen. The flexibility of the engine's fuel use has been developed by INNIO together with the Large Engine Competence Center (LEC) in Graz.



INNIO Jenbacher J620 gas engine

NEWS NUDGES

Global oil demand grows as GDP recovers

Total global oil demand is expected to increase year-on-year by 4.2 million barrels per day (MMb/d) in 2021 and further grow by 3.5 MMb/d in 2022, as economies recover from the global coronavirus crisis. The International Monetary Fund (IMF) predicts economic growth of around 5.4% in 2021, compared with a decline in real GDP in 2020 of -4.4%.

China's gas imports jump

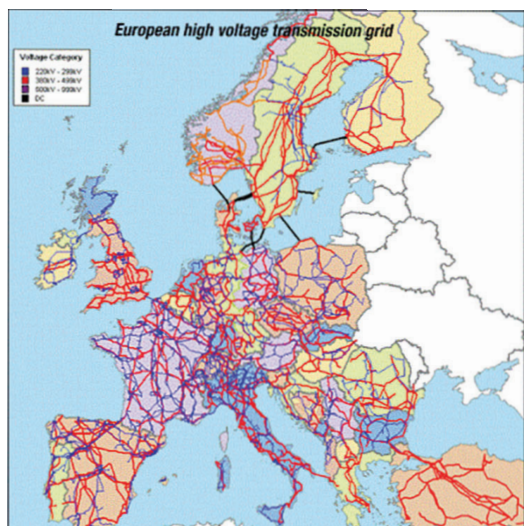
China's combined imports of pipeline gas and LNG imports have risen by 17.5% to 20.80 million tonnes in January and February when unseasonably cold weather pushed up gas demand for space heating. China's main LNG suppliers are Australia, Qatar, Malaysia, Indonesia, Russia and the US. According to China's General Administration of Customs, Asia's largest economy also achieved a trade surplus of \$103.25 billion for the first two months of 2021.

UK fuel duty remains frozen

In the 2021 Budget, UK Chancellor Rishi Sunak has kept the fuel duty frozen for the tenth successive year along with a freeze in income tax while cooperation tax will rise to 25% for some larger corporations in two years' time. Presenting his second budget, the Chancellor pointed out the UK economy is forecast to reach pre-Covid levels by the middle of next year (2022), six months earlier than anticipated earlier.

Duke Energy claims natural gas is cheaper than energy storage

Duke Energy Progress and Duke Energy Carolinas have both indicated in their latest integrated resource plans (IRPs) they view battery storage as potentially more costly than proven gas-fired generating technology. Market observers noted, however, that Duke's estimates peg the capital costs of a 50 MW/200 MWh energy storage plant at \$347 per kWh – far higher than the cost of units that entered commercial service in 2020, as per Lazard data.



European high voltage transmission grid



Aggreko helps Brazilian utility to tap landfill gas for power gen

Aggreko has signed a seven-year contract with Brazilian energy company EVA Energia for a 10 MW renewable power solution using landfill gas. The system will produce electricity from biogas derived from the Seropédica landfill in Rio de Janeiro State as well as from Mauá, São Paulo State, and delivering cleaner energy for approximately 40,000 households.

The Seropédica landfill is the largest in Latin America, with a capacity of up to 10,000 tons of waste per day, with the Mauá site, located in São Paulo state, receiving more than 3,000 tons per day. Together, the two sites have the potential to produce 73 million cubic metres of biogas each year.

Making use of landfill gas that would otherwise be released into the atmosphere, the project will help avoid a total 24,440,400 cubic meters annually in methane emissions. To that end, Aggreko will deploy eight 1.25 MW generators across the two sites, providing a total of 10 MW power.

Making use of methane emissions

For the power generation process, biogas is recovered from the landfill sites via a series of wells drilled into the rubbish. These wells are connected by a pipe system, which col-

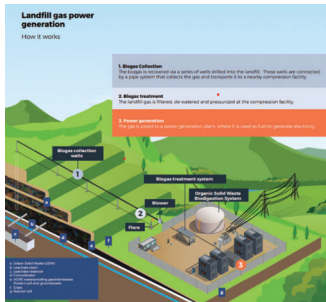
lects the gas and transports it to a compression system, where it is filtered, de-watered and pressurized. From there, the gas is piped to a power generation plant, where it is used as fuel to generate electricity, before being passed on to power local homes in the region.

"As the third largest source of anthropogenic methane emissions in the world, landfill biogas is an underutilised resource for power generation," commented Pablo Varela, managing director at Aggreko Latin America. He underlined that customers increasingly look for sustainable and flexible carbon solutions that help them reach their carbon emission targets. "Landfill gas is ideal to support delivery of these goals," he said, adding Aggreko has optimized its generators so that they can run efficiently on biogas and other future fuels.

The two renewable power solutions at Seropédica and Mauá will be owned by Brazilian energy company EVA Energia, a joint venture between the GNPW Group and the Urca Energia Group - both focused on distributed generation and alternative fuels. The two companies are also part of Evolution Power Partners (EPP),

developer of more than 5 GW in natural gas generation projects in Brazil.

Under the contract with EVA, Aggreko is responsible for the installation, operation and maintenance of the entire system for the contract's duration. The operation of the overall systems will be managed by Aggreko's Remote Monitoring software. The project is part of a series of contract wins in Latin America for Aggreko, which recently announced plans for a 26 MW solar hybrid solution at Salares Norte mine in Chile, as well as a number of hybrid and storage solutions for customers in Argentina and Brazil. ■



Cyfield chooses Siemens gas turbine for 260 MW CCGT in Cyprus

Cyprian construction company Cyfield has selected Siemens Energy to supply three SGT-800 gas turbines for the Mari combined-cycle power plant. Start-up of the upgraded CCGT is scheduled for 2023 - in time for the arrival of first LNG at Cyprus regas terminal, currently under construction.

Until now, the island power grid on Cyprus is almost completely served by heavy fuel oil-fired boilers. Space for wind farms and solar PV is limited on the island, hence switching from HFO to natural gas is key to reduce sulphur oxide and to keep particle emissions to a minimum.

In addition, high-efficiency of the new Mari CCGT will significantly reduce the cost of electricity in Cyprus. Siemens scope of supply for the project includes three SGT-800 gas turbines, three SGen5-100A generators and a 20-year long-term service and maintenance agreement.

"The development of this power plant is vital for the energy sufficiency and independence of Cyprus. Additionally, the cost of electricity will be significantly lower for Cyprus businesses and households, directly benefiting the economy," said Kyriakos Chrysoschos, founder of the Cyfield Group.

Karim Amin, Executive Vice President Generation at Siemens Energy added the new power plant will "ensure a reliable, environmentally friendly and economical electricity supply for many years to come." Moreover, the "gas turbines easily can be upgraded to burn e.g. hydrogen, so that fuel should become available in the future." ■

Construction of LNG-to-Power plant (350 MW) starts in Sri Lanka

Works on the Lakdhanavi LNG-to-Power project in Kerawalapitiya, Sri Lanka, have started today, with the first construction phase due completed in 21 months. Once operational, the 350 MW combined-cycle plant will provide cheaper electricity than diesel-fuelled gensets, saving of up to 15 Rupees (US\$0.077) per unit.

According to calculations by the Sri Lankan energy ministry, this would calculate to annual savings of Rs. 12 billion (US\$ 61 million). These fuel savings accumulate over the plant's estimated lifetime of 20 years, and need to be considered against the CCGT's total costs of the combined-cycle power project, pegged at US\$ 150 million.

Completion the second CCGT unit will add a further 130 MW to the national power grid and bring the plant to its full nameplate capacity to 350 MW.

LTL Holding, established in 1980, will provide the Engineering, Procurement and Construction (EPC) services for the Lakd-

hanavi LNG-to-Power project. At the same site, it has already built and operated several diesel-fuelled emergency power plants.

Over the past few years, LTL Holding has diversified its offering to multiple fuel sources and is now expanding its EPC capabilities towards capacities beyond 500 MW.

In Sri Lanka, the company has already realised the 3x100 MW Yugadanavi power station on behalf of West Coast Power as an Independent Power Project (IPP) under an EPC contract with Ceylon Electricity Board (CEB) in 2007. Construction began in November 2007, and progressed in two phases, with the first 200 MW phase completed in just 10 months, and the second phase in February 2010. ■

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