



MHPS' T-Point 2 starts commercial operation at over 64% efficiency

Mitsubishi Hitachi Power Systems' T-Point 2 gas turbine validation facility has started up in Japan. Powered by a JAC gas turbine, the T-Point 2 power station has entered operations at record-setting combined-cycle efficiency greater than 64% and a turbine inlet temperature of 1650°C.

Paul Browning, President and CEO of MHPS Americas pointed out the company's dedicated team of engineers, procurement and construction personnel has managed to commission and start up T-Point 2's on schedule, on budget, and exceeding output and efficiency expectations.

Turbine validation at 8,000 operating hours

T-Point 2, built as a demonstration plant at Takasago Works in Hyogo Prefecture, Japan, has been designed to replace MHPS' original T-Point plant. Here, MHPS can validate its new gas turbines for a minimum of 8,000 operating hours. This

is equivalent to nearly one year of normal operation and a key insurance industry criterion for fleet reliability.

"Unlike other manufacturers, MHPS demonstrates new gas turbine capabilities at our own combined cycle power plant before shipping to our customers. This enables us to provide unmatched performance, such as the 99.5% reliability of our J-Series gas turbines," Browning said,

continued on page 2



View of the new T-Point 2 with T-Point in the background at Takasago Works, Japan



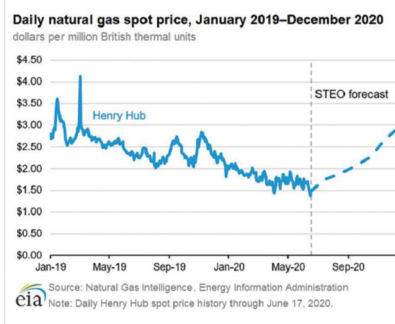
Mitsubishi Hitachi Power System's H501JAC gas turbine

Henry Hub spot prices at historic low despite rising gas-burn

Natural gas spot prices at the U.S. Henry Hub have fallen to historic lows despite rising gas-burn for power generation. Production keeps exceeding demand, with feedgas for liquefaction and export at low levels of around 4.0 billion cubic feet per day (Bcf/d) so far in June and storages filling fast.

The feedgas to LNG export terminals in June was 1.4 Bcf/d lower than feedgas volumes last year, according to IHS Markit figures, and more than 5.0 Bcf/d lower than the record-high feedgas volumes estimated in late March. The coronavirus pandemic has caused a global plunge in energy demand, though Asian gas markets are gradually recovering.

Lockdowns to contain the coronavirus, which has hit the United States particularly hard, has substantially reduced gas consumption from industries and businesses. Estimates from S&P Global Platts suggest that average industrial natural gas consumption in June 2020 has declined



about 2.1 Bcf/d, or 9.6%, compared to June last year.

Higher gas-burn despite low electricity demand

Forward gas prices are set to remain low throughout this summer, accelerating the coal-to-gas

continued on page 2

AGENDA

COMPANIES

Rolls-Royce "reviews its options" as takeover rumours mount

2

US GAS MARKET

Stay-at-home orders push U.S. residential electricity sales up 6%

3

REGULATION

Germany passes law to ensure coal exit no later than 2038

4

COMPANIES

Dominion sells pipelines and storage to U.S. investor Warren Buffett

5

TECHNOLOGY

Cummins takes legal action against Turbo Lab over turbo nozzle rings

6

PROJECTS

MAN completes power plant expansion on the Faroe Islands

7

Continued from page 1, top story

adding: "This project positions us years ahead of any manufacturer in putting the latest generation of 1650°C gas turbine technology into commercial operation."

Aim for 100% hydrogen firing

The JAC turbine can be converted from natural gas to a blend natural gas with 30% re-

newable hydrogen. MHPS aims to eventually run the turbine on 100% renewable hydrogen to completely eliminate carbon emissions.

The digital building blocks being validated at T-Point 2 also include an advanced Automatic Plant Startup package that is closely linked to the MHPS' advanced analytics and diagnostics. Operations will hereby trans-

ferred from the local control room to the Takasago Remote Monitoring Center to MHPS' central and remote control center.

At T-Point 2, MHPS is also evaluating the first ever Netmation 4S Digital Control System to be used on an advanced class gas turbine combined cycle plant. Netmation 4S is said to add further reliability, redundancy,

Rolls-Royce "reviews its options" as takeover rumours mount

Rumours of a Chinese takeover of the British multinational engineering company Rolls-Royce are circulating once again. In a statement, the company confirmed it is in "early stages of reviewing options to strengthen its balance sheet," though no decisions have been made.

"Our current financial position and liquidity remain strong," Rolls-Royce stressed without elaborating, adding it will "make a further announcement if and when appropriate."

The British government has a 'golden share' in Rolls-Royce and would hence need to consent to any takeover. Market observers note it is "highly unlikely" that Prime Minister Boris Johnson would rubber stamp such a deal given Rolls-Royce's history and strategic importance to the British economy.

Draw-down on £2.5bn credit line

CEO Warren East already proposed a "major reorganisation" saying the impact of COVID-19 on Rolls-Royce and the whole of the aviation industry is "unprecedented." Since then the company has taken action to strengthen the financial resilience of our business and reduce cash expenditure in 2020.

In April, Rolls-Royce decided to draw fully on a £2.5 billion revolving credit facility to "ensure cash headroom" in the event

of a prolonged reduction in trading activity due to the Covid-19 outbreak. The company's gross cash balance is now £5.2 billion, the company said at the time, and an additional credit has been lined up to bring overall liquidity to £6.7 billion.

Cutting jobs and capital spending

In May, Rolls-Royce announced the restructuring that will see the loss of at least 9,000 roles from our global workforce of 52,000. "This is not a crisis of our making. But it is the crisis that we face and we must deal with it," Mr. East commented. "Being told that there is no longer a job for you is a terrible prospect and it is especially hard when all of us take so much pride in working for Rolls-Royce," he added.

The proposed reorganisation is hoped to generate annualised savings of more than £1.3 billion, of which the reduced headcount will contribute around £700 million. The cash restructuring costs related to these actions are likely to be around £800 million,



the company specified with outflows incurred across 2020 to 2022.

Turing to clean energy business

Remaining positive, the Rolls-Royce CEO said the strategic choices made over the last few years leave the company well placed to capitalise on the long-term potential of the markets it is active in - aviation and power generation.

"The world on the other side of this pandemic will need the power that we generate to fuel economic recovery. I absolutely believe the call for that power to be more sustainable will be stronger than ever," Mr. East said, stressing the company's need to innovate as the industry moves to net-zero carbon emissions. ■

Continued from page 1

switch in the power sector where gas has become the cheaper fuel source compared to thermal coal. Average daily power burn is up about 6% in June compared to last year, according to U.S. government data.

Strikingly this rise in gas power generation occurred despite essentially flat, if not falling, electricity demand growth so far this June.

Production falls slower than demand

Another effect of historically low natural gas prices is declining natural gas production. According to data from IHS Markit, dry production totalled about 90 Bcf/d in June, down nearly 3.7 Bcf/d from March 2020.

The recent steep fall in demand has outpaced the declines in production, putting downward pressure on Henry Hub prices.

Further declines in gas production are expected due to the inherent time lag between gas price changes and adjustments to production levels.

Henry Hub seen rebound in winter 2020/21

In its June STEO forecasts, the U.S. Energy Information Agency (EIA) says dry production will continue to fall steadily, reaching a low of 84.2 Bcf/d in May 2021.

Falling gas production will put upward pressure on the Henry Hub price in the coming months, if demand keeps recovering. The June STEO expects higher natural gas prices by the end of 2020, forecasting Henry Hub to average \$2.95/MMBtu in December. ■

Gas to Power Journal

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Stay-at-home orders push U.S. residential electricity sales up 6%

Lockdowns and stay-at-home orders have increased U.S. residential electricity use substantially in April through June. The sector would have used 3.1 million MWh of electricity per day in April, as per the previous five years, but in April 2020 demand was 3.3 million or about 6% higher.

Analysts noted the residential sector is sensitive to temperature changes and tends to use more electricity over the summer period than the commercial and industrial sectors.

Across all sectors, April U.S. electricity sales declined 4% year-on-year, largely due to lockdown measures to reduce the spread of the coronavirus.

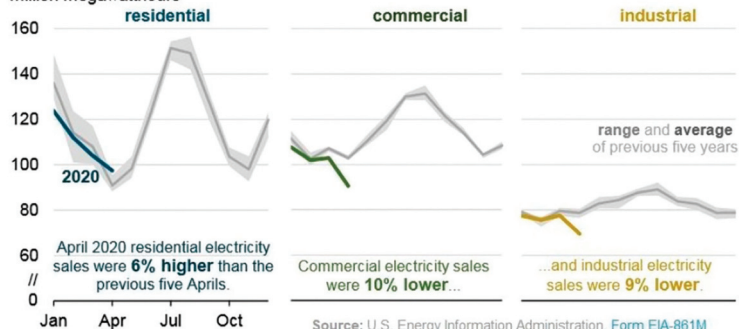
Starting with California on March 19, states began to issue stay-at-home orders in response to the pandemic which made most office workers transition to stay home and work from there, pushing up residential gas and electricity demand.

Commercial electricity demand, in contrast, fell by more than 10% during the lockdown period and industrial electricity demand was 9% lower. Lockdowns had a severe impact on energy-intensive industries and manufacturing whose demand fell to about 2.6 million MWh/day, down from usually about 3.4 million MWh/day.

Keeping a close watch on electricity use



U.S. monthly electricity sales by end-use sector (Jan 2015–Apr 2020)
million megawatthours



during the health crisis, the U.S. Energy Information Administration's (EIA) is monitoring sectoral demand in its Hourly Electric Grid Monitor.

US gas exports to Mexico rise with completion of Wahalajara system

Natural gas exports from the United States to Mexico are forecast to rise by 40% with the completion of the southernmost segment of the Wahalajara system, also known as the Villa de Reyes-Aguascalientes-Guadalajara (VAG) pipeline. The 0.89 billion cubic feet per day (Bcf/d) pipeline entered service this June.

Utilization of the Wahalajara system is ramping up quickly which boosts U.S. gas exports to Mexico out western Texas, and there is also additional takeaway capacity out of the Permian Basin. Texas is home to the Eagle Ford play, one of the most actively drilled targets for unconventional oil and gas.

US gas exports to Mexico reached a record 5.5 billion cubic feet per day (Bcf/d) in October 2019, largely due to the completion and startup of the Sur-de-Texas-Tuxpan pipeline in September. Gas flows via the US border at Brownsville, Texas, to the south-

eastern state of Veracruz in Mexico averaged 0.6 Bcf/d during the last quarter of 2019, or about 20% of the pipeline's capacity.

US pipeline gas exports to displace LNG

Analysts say US gas deliveries via the Wahalajara network will displace higher-cost LNG imports into Mexico's Manzanillo terminal, which serves markets in Guadalajara and Mexico City.

Mexico's gas demand keeps rising, spurred by the recent start-up of several combined-cycle power stations and booking

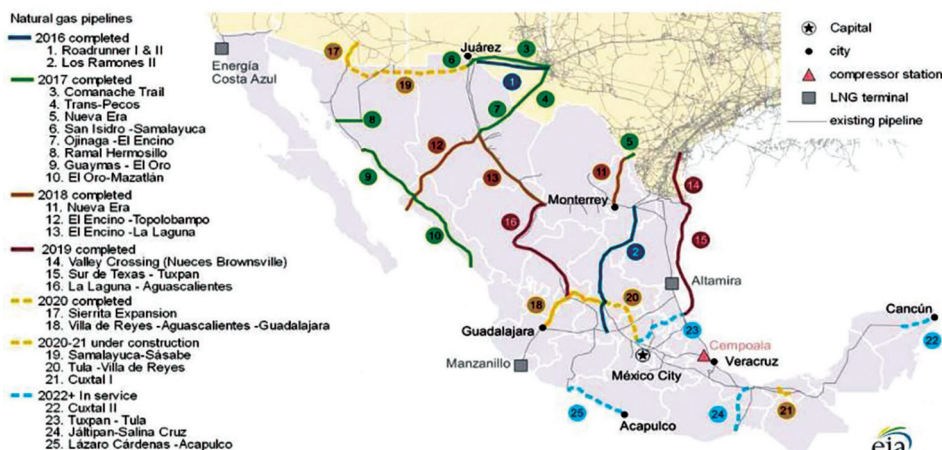
for the scheduled 2020 completion of the 0.89 Bcf/d Tula-Villa de Reyes pipeline which will stretch to central Mexico.

However, most of the demand centers are in southern Mexico, waiting to be connected to the VAG pipeline. Three of the project's four pipelines in Mexico that are currently in-service include the 1.4 Bcf/d Ojinga-El Encino pipeline (in service since June 2017), the 1.5 Bcf/d El Encino-La Laguna pipeline (in service since January 2018) as well as the 1.2 Bcf/d La Laguna-Aguascalientes: 1.2 Bcf/d (operational since December 2019).

Waha Hub gas prices set to strengthen

Permian gas prices at the Waha Hub have been steeply discounted to Henry Hub, the US national gas benchmark. However, analysts expect Waha gas prices to strengthen as more and more of the surplus shale production from the Permian gets exported to Mexico.

Currently, the Comanche Trail pipeline keeps delivering an average of 0.1 Bcf/d of natural gas to Mexico since the San Isidro-Samalayuca pipeline entered service in June 2017. Flows are not expected to rise further until the 0.47 Bcf/d Samalayuca-Sásabe pipeline will be completed on the Mexican side in either late 2020, or early 2021.



Source: U.S. Energy Information Administration, Comisión Nacional de Hidrocarburos, Mexico

Germany passes law to ensure coal exit no later than 2038

The German Parliament has adopted a law that ensures the phase-out of coal power by no later than 2038. Several reviews throughout the 2020s will assess progress on the build-out of wind and solar power as the end date for burning lignite could be brought forward to 2035.

The adoption of the law follows two years of intense debate among energy industry, trade unions, regional governments and environmentalists about the speed and intensity of Germany's green energy transition.

Coal utilities, federal states get compensation

A compromise was reached on the basis that the Government agreed a 40 billion Euros support program that compensates both coal plant operators and supports the economic transition of coal region such as Rhine-Ruhr region and the Lusatia, situated at Germany's eastern border with Poland.

In view of Germany's 2021 election year, the adoption of the coal exit law allows the current coalition government to implement long-delayed measures though this topic will keep influencing election campaigns. How to best manage the costs of decarbonisation conjures up much controversy among Angela Merkel's conservative CDU/CSU alliance, the Social Democrats (SPD) as their current coalition partner, the Liberals (FDP) and the Green Party.

RWE's earning from lignite, nuclear may vanish by 2023

In an analysts' call, RWE chief executive Rolf Martin Schmitz stressed the company "bears the main burden of the lignite phase-out, which will stretch it to its limits." Earnings from RWE 2.9 GW lignite and nuclear portfolio may fall to €200 million, or even net zero from 2023 due to mandatory plant closures.



RWE's 3.6GW Niederaussem coal power plant in the Rhein-Erft region.

Schmitz stressed, however, the Essen-based utility will implement the required capacity reduction by 2023, as mandated by the German coal exit, "nearly entirely on its own account."

The first lignite power plant to be shut down by RWE is Niederaussem. The massive 3,641 MW facility will be taken offline this year, and RWE also agreed to close its Inden and Hambach opencast mines much earlier than originally planned. For complying with the coal exit timeline, RWE will get some 2.6 billion in compensation from the German taxpayer.

Critics had dismissed the compensation payments as too high and unjustified given that most of the plants, scheduled for closure, are amortized and are getting close to the end of the technical life-time.

Going forward, RWE is keen to get rid of its dirty coal image and has hence lined up a substantial share of green energy investment. A total of 2.7 GW in renewables capacity is currently under construction," CEO Schmitz said, adding, the group has a sizeable project pipeline of over 20 GW, which will add to RWE's current 9 GW of wind and solar power assets. New capacities will be predominantly added in the onshore wind and solar segment, with RWE saying these projects are hoped to achieve an adjusted EBITDA of between €500 million and €600 million.

Lockdown accelerates Energiewende policy

Looking at the German wholesale power market, there has been a sharp decline in coal-burn during the Covid-19 lockdown period. Demand for coal-fired energy fell to less than 16% of the energy mix in April due to ample wind and solar energy supply with near-zero operating costs.

Some analysts argue this shows Germany's 2038 coal exit date has been "overtaken by reality."

In fact, nearly 90% of Germany's coal plants were not profitable last year, according to E3G, an independent climate change think tank. The lockdowns to contain the virus have exacerbated the speed of the green energy transition, whereby the share of coal power dropped to a record low of 16% in April.

Renewables energy supply rose 6% in the first quarter of 2020, compared to Q1-2019, while the contribution of oil fell by -3.2%, natural gas by 5.5% and the share of nuclear power plunged by -17%.

Power prices turn negative, grid remains resilient

During April and May, electricity from wind and solar power sources covered a very large share of Germany's overall electricity demand. On some days, an actual oversupply of wind and solar energy resulted in negative wholesale power prices at the European Energy Exchange (EEX) in Leipzig.

Plentiful sunshine and mild weather in April and May provided good conditions for solar PV generation, and when combined with high levels of wind power, led to overall supply outstrip demand. Already in March, the German wholesale power market logged about 130 hours of negative prices, mostly during periods of high wind production; that was up from 90 hours in March 2019.

"The hours are now increasing in which a high feed-in of renewable energies, especially from wind energy, meets low demand for electricity and leads to negative spot prices," enervis analyst Tim Steinert said. The consultancy expects the number of hours with negative prices to increase by 80% to 150%.

On a positive note, the surge in renewable energy supply has put much strain on grid operators' balancing capability, especially during times of low demand. But it has proven the resilience of the German power grid, exemplifying that the system could run with much higher levels of green energy than anticipated earlier. An encouraging sign that system stability does not hinge on lignite, though the Germany's simultaneous exit of coal and nuclear energy will pose some challenges along the way. ■

Dominion sells pipelines and storage to U.S. investor Warren Buffet

Dominion Energy has struck a \$9.7 billion deals to sell its gas transmission and gas storage assets to Berkshire Hathaway Energy, owned by the U.S. billionaire investor Warren Buffet. As part of the transaction, Berkshire Hathaway will acquire 25% of the Cove Point LNG plant in Maryland.

The assets include over 7,700 miles of natural gas transmission lines, with approximately 20.8 billion cubic feet per day of transportation capacity and 900 billion cubic feet of operated natural gas storage with 364 billion cubic feet of company-owned working storage capacity, and partial ownership of a liquefied natural gas export, import and storage facility.

Berkshire Hathaway to operate Cove Point LNG

The sale includes a 25% stake in Cove Point LNG while Dominion Energy will continue to own 50% of the liquefaction terminal and

Brookfield Asset Management the remaining 25% share.

Berkshire Hathaway said it operate the Cove Point facility once the transaction closes. The Cove Point export terminal is one of only six LNG export facilities in the U.S.

Commenting on the deal, Warren Buffet voiced his admiration for Tom Farrell, President and CEO of Dominion Energy for his "exceptional leadership" across the energy industry as well as within the company. "We are very proud to be adding such a great portfolio of natural gas assets to our already strong energy business," Buffet said.

LNG project deal in Quebec halted

Market observers say the acquisition Dominion Energy and particularly the operatorship of Cove Point LNG is a triumph for Buffet, who founded his investment company in the state of Nebraska.

Earlier this year, Buffett made a move for an LNG and pipeline natural gas project in Canada. However, at the last minute he



Cove Point LNG at the start of commissioning.

NEWS NUDGES

Denmark paves the way for Nord Stream 2

Denmark on late Monday gave the Nord Stream 2 consortium permission to utilize pipe-laying vessels with anchors in Danish waters, paving the way for the Gazprom-led consortium to complete the interconnector. Construction of the 1,230-kilometre pipeline is nearly complete, except for a final stretch of about 120-kilometers in Danish waters. The project was halted in December when the Swiss-Dutch pipe-laying company Allseas suspended works over threats of U.S. sanctions.

KKR buys stake in First Gen

Valorous Asia Holdings, owned by KKR investment funds, has bought a 11.9% stake in First Gen through a voluntary tender offer. First Gen, one of the Philippines' largest independent power producers with 3,492 MW installed capacity, is owned by First Philippine Holdings which is controlled by the Lopez family. KKR's acquisition of the First Gen stake is worth nearly \$192.3 million.

pulled out of the \$6.7 billion LNG project deal in Quebec over concerns about railway blockades going on at the time and infrastructure challenges. ■

Shanghai Electric renews bid to buy majority stake in K-Electric

Shanghai Electric Power has made a fresh and slightly improved offer to K-Electric to acquire 66.4% of its shareholding. Arif Habib Ltd, the local bidding manager of Shanghai Electric, specified his client wants to buy up to 18.336 billion of K-Electric's total issued shares.

The intention of the Chinese major is to buy 66.4% of K-Electric's shares through an agreement and 16.8% of shares through a public offer.

The board of K-Electric has not yet decided whether to accept the bid. It confirmed receipt of the fresh Public Announcement of Intention (PAI), filed via the Securities and Exchange Commission, whereby Shanghai Electric intends to acquire 18,335,542,678 of KE's ordinary shares.

Venturing abroad

Shanghai Electric, a leading manufacturer and supplier of power generation and industrial equipment, in April posted a 26% rise in its fiscal 2019 revenues to 127.509 billion Remimbi (US\$ 18,180 billion) as well as a 24.83% rise in profits to 3.72 billion Remimbi (US\$0.53bn).

New orders, billed in fiscal 2019, have increased by 30.6% to 170.79 billion Remimbi or approximately US\$24.35 billion.

Sales rose by 12.1% to 45,944 million Remimbi, mainly due to the "steady performance" of the company energy equipment business which includes coal- and gas-fired turbines as well as related equipment for power transmission, wind turbine components and energy storage, as well as chemical equipment.

SEunicloud Platform

In 2019, Shanghai Electric also launched the "Industrial Internet SEunicloud Platform" – a one-stop solution for wind power intelligent operation, thermal power remote operation and machine tool maintenance.

Users of the SEunicloud platform can users can remotely run equipment diagnos-



tics prior to placing any order. They can procure and manage supply chains and monitor supplier contracts, source bidding, online-purchasing and order coordination.

The intelligent supply chain platform also helps match sellers and buyers through historical data analysis in the procurement pricing process and automatically tracks and documents suppliers' historical performance. This facilitates the overall supply chain management process for due diligence. ■

Cummins takes legal action against Turbo Lab over turbo nozzle rings

Cummins has taken legal actions against Turbo Lab for infringement of patents by the unauthorized selling of turbo nozzle rings, a critical component of the Holset VGT engine. Turbo had to concede Cummins' patents were valid and infringed, and must now destroy all existing infringing stock.

Innovation and generation of intellectual property have been a part of the Holset VGT success since it entered the market in 1998, Cummins underlined. The use of VGT turbos helps plant operators to improve fuel economy and reduce emissions.

"For more than 100 years Cummins has created dependable quality power technologies and we are committed to defending our intellectual property for the success of our customers," said Shon Wright, Vice President of Cummins Turbo Technologies.

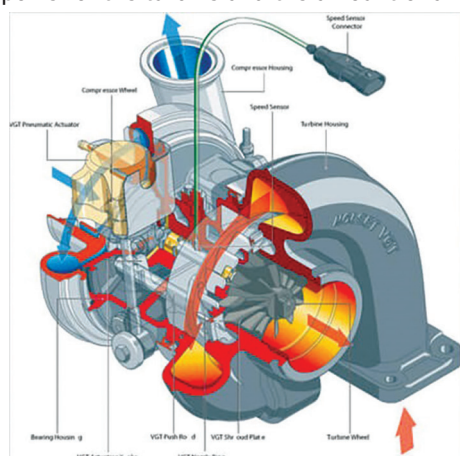
The Holset VGT from Cummins is suitable for light to heavy-duty applications. The VGT turbo has a patented one-piece sliding nozzle that continuously moves to vary the power of the turbine and the amount of air

delivered to the engine.

In the power generation process, exhaust gas enters the turbine section of the turbocharger as it leaves the exhaust manifold. Pressure from the exhaust gas causes the turbine to rotate.

Cummins is a global leader in power generation equipment. The company's products range from diesel, natural gas, electric and hybrid powertrains and powertrain-related components including electric power generation systems, batteries, electrified power systems, hydrogen generation and fuel cell products.

Founded in 1919, the company today employs approximately 61,600 people and in 2019 earned about \$2.3 billion on sales of \$23.6 billion. ■



E.ON and thyssenkrupp link green VPPs to produce hydrogen

Europe's largest power producer E.ON and the German steelmaker thyssenkrupp have teamed up to produce hydrogen by linking large-scale electrolysis units, built by the latter, with E.ON's virtual power plants (VPPs). That way, industrial hydrogen can help integrate green energy into the grid.

The regulation of the hydrogen plants would be done through E.ON's virtual power plant that links a total of 150 plants in Germany and the United Kingdom. A total of around 600 MW of this VPP capacity is being marketed.

The principle is that if there is a high demand in the power grid, the plant will shut down hydrogen production so that the energy required for electrolysis is available on the grid instead for public power supply. Conversely, hydrogen production is ramped up if more energy from wind and solar power sources is fed into the grid than can be distributed.

thyssenkrupp and E.ON successfully tested the system at the Carbon2Chem pilot plant with a capacity of up to 2 MW in Duisburg. E.ON has also checked that the plant meets all the requirements for participation in the balancing power market. ■



Golar Power signs deal with Galileo Tech on small-scale LNG projects in Brazil

Golar Power, part of Hamilton-based Golar LNG, has teamed up with Galileo Technologies to expand its small-scale LNG activities in Brazil. Together with Stonepeak, Golar already developed several large-scale LNG-to-Power projects in northeast Brazil. Now, it turns to biomethane.

The cooperation with Galileo Technologies will allow Golar to develop a decentralized LNG and power generation business, based on biomethane. Such projects are encouraged by a new regulatory framework for sanitation, approved by the Brazilian Congress in late June this year. The new law encourages private sector management of landfill sites and associated waste-to-biofuel initiatives.

The first order, stipulated by Galileo, will see Golar supply two micro-LNG plants to

produce about 30 tonnes per day of LNG in a mature gas field in Bahia state. The second order is for equipment to capture and liquefy biomethane from landfills in Sao Paulo state, with capacity to produce up to 15 tonnes per day of bio-LNG.

According to Golar Power, these projects are designed to take fill gaps in Brazil's gas pipeline network and take natural gas to remote regions that lack connections, often to both the gas and electricity grid.

Fuel for small-scale LNG-based power



plants used to be distributed by trucks to the remote locations via the road network. Galileo's gas treatment and liquefaction technologies, in contrast, are adaptable for the use of scattered methane sources, which "frequently are those closest to consumers," underlined Galileo's Brazil vice president, Horacio Andrés. ■

MAN completes power plant expansion on the Faroe Islands

MAN Energy Solutions has completed the Sund power plant extension and handed it over to Eifelagið SEV, the local energy supplier on the Faroe Islands. Four MAN 9L51/60 engines were added, enhancing the plant's generating capacity by 37 MW as well as district heating.

Situated near Tórshavn, the Faroese capital, the power plant now has sufficient capacity to supply electricity to the almost 52,000 islanders. To that end, SEV relies on an intelligent combination of renewable energy sources, storage solutions and power-plant engines to ensure grid stability.

Sund is the largest of the Faroe's three engine-driven power plants. Apart from Sund, SEV also operates hydroelectric power plants, several wind farms and energy-storage solutions.



'Sund' power plant near Tórshavn, the Faroese capital

From base-load security to intelligent backup

"The role of the Sund power plant has changed over the past few years. Today, it still serves to secure the base load, but it has also become an indispensable backup that compensates for weather-related fluctuations of renewable energies," said Dr Tilman Tütken, Head of Region Europe, Business Unit Power Plants at MAN Energy Solutions

Responsible for the Sund upgrade was Danish power-plant specialist, Burmeister & Wain Scandinavian Contractor A/S (BWSC), while MAN supplied the four engines. These MAN 51/60 engines are intended to run at 80% load and thus to generate district heating with the remaining 20% serving as a variable reserve.

"Our engines can increase their output at any time to compensate for power fluctuations and are throttled back when wind or pre-



Four MAN engines will add 37 MW to the Sund power station

cipitation conditions improve," added Tütken. "Thanks to this setup, SEV can on the one hand exploit the full potential of renewable energy and, on the other, guarantee maximum grid stability."

Hybrid systems as a vision of the future

The isolated energy system in the Faroe Islands is an impressive example of how all available energy resources can be integrated into an intelligent and innovative microgrid. In Tütken's view "the future is hybrid," and the hybrid power solution on the Faroe Islands' energy system "can act as a model for other projects" in remote regions.

Evonik and Omexom order 18 of GE's g³ 'Green Gas for Grid' solution

Germany's Evonik and UK's Omexom have ordered 18 of GE's 'Green Gas for Grid' solutions, or 'g³' gas-insulated switchgear (GIS) bays for use at industrial sites. g³ is an alternative to sulphur hexafluoride (SF₆), a potent greenhouse gas, used in high-voltage equipment including switchgear.

Switchgear bays are found at substations and help dispatch or cut electrical power in case of a problem on the grid. Together, German's specialty chemicals leader Evonik and UK's Omexom, an Engineering Procurement and Construction (EPC) company, recently ordered a total of 18 g³ GIS bays.

Evonik signed a contract for 10 F35-145kV g³ GIS bays for its Marl Chemical Park in western Germany. Commissioning is estimated for June 2021.

Omexom, meanwhile, selected GE as its 132 kV GIS supplier for an industrial customer's waste plant in the UK. The contract for eight 145 kV GIS bays using g³ was signed in March, with commissioning estimated for September 2021.

Slashing CO₂ emissions by 99%

The innovative products feature the same high performance and reliability as SF₆ equipment but have a gas mass with more than a 99% reduced CO₂ equivalent value. More importantly, life-cycle assessments (LCAs) have shown that g³ products do not cause pollution transfers to other environmental indicators.

Jürgen Bucker, head of regulation man-



agement energy networks at Evonik said g³ was a "natural choice" for the company. "Not only do the g³ products offer us the same reliability and ease of handling as our previous SF₆ equipment," he said, "they will go a long way in helping us reach our goal of halving our absolute Scope 1 and Scope 2 greenhouse gas emissions by 2025."

With these two industrial orders, GE has now sold more than 100 g³ GIS bays since launching g³ on the market in 2016. Eighteen transmission and distribution utilities have installed g³ equipment at a total of 26 sites across Europe.

With the largest 145 kV GIS SF₆-free installed base, g³ is the leading SF₆-free solution for high-voltage equipment. SF₆ is estimated to contribute 23,500 times more emissions than CO₂, if leaked, and can remain in the atmosphere for up to 3,200 years.

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