



Economics shift further towards gas generation in Europe

Demand destruction due to lockdowns has shifted the relative economics of Europe's fossil power generators towards gas. Clean spark spreads are 10-14 EUR/MWh higher than dark spreads, but lower power prices mean it's still insufficient to see positive margins for CCGTs in Germany or France.

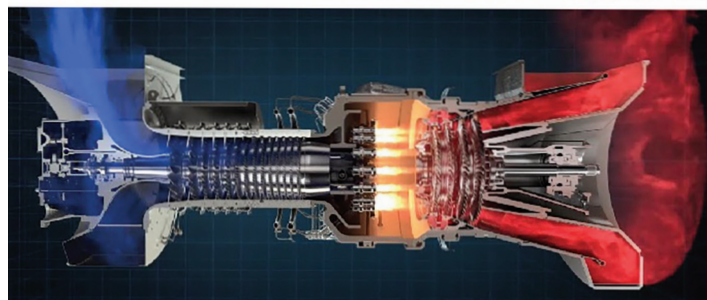
Spark spreads, the profit margin for burning gas to generate electricity, are deep in the red. April'20 clean spark spreads in France (for 49.13% efficiency power plants) were last seen at €-5.30/MWh, while the comparable spread in Germany fell to €-3.19/MWh.

The economics of flexible combined-cycle gas turbine (CCGT) power plants are currently undermined by depressed electricity demand and high availability of renewable energy supply. Higher wind speeds during week 14, combined with low power prices have resulted in some negative price hours – in Germany and France for the second weekend in a row and also Great Britain.

Demand-side shock

On energy markets, the corona crisis is mainly felt on the demand side. French industrial power demand fell 26.4% due to the lockdown, extended until at least May 11.

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Pandemic leads to more hours with negative power prices at EEX

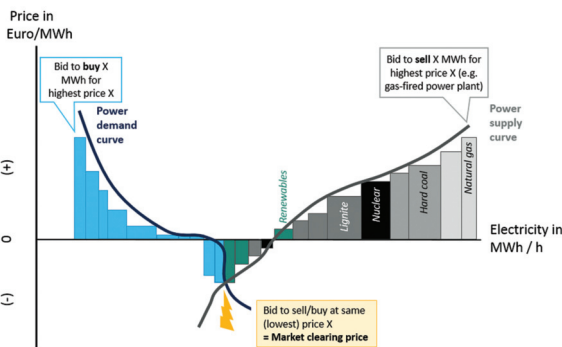
Lockdowns will lead to more hours of negative wholesale electricity prices at the European Energy Exchange (EEX) this year. With many industries shut, energy use in Germany is forecast to fall 6% while wind and solar power output remains high, pushing prices below zero.

Plenetiful sunshine across Germany has lifted temperatures to 26 degrees this week, providing good conditions for solar PV generation. Combined with wind power from the northern part of the country, electricity from renewables available on the market is now prone to outstrip supply.

"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," said enervis analyst Tim Steinert. The consultancy expects the number of hours with negative prices to increase by 80 to 150%.

System lacks power storage

Large-scale power storage is currently not available in the German grid, so the amount of electricity fed into the system and the amount used



have to be kept equal to maintain a stable frequency on the grid. When supply outstrips demand, power producers have to pay their wholesale customers to buy the excess electricity, resulting in negative power prices.

Already in March, the German wholesale power market logged about 130 hours of negative prices, mostly during periods of high wind production;

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The French front-month power price shed 9% on Tuesday following the lockdown extensions, while containment measures in Germany are gradually lifted. The French May-2020 power contract was last seen trading at €15.15/MWh. Total electricity demand in France dropped by nearly 20% since March 17, when the lockdown was first imposed, and is now likely to fall further.

Sharp fall in gas and EUA price

Spark spreads throughout Europe are impacted by a 33% plunge in the benchmark carbon price and record low prices for nat-

ural gas at the European gas benchmark hub, the Dutch TTF. The carbon benchmark Dec-20 EUA contract shed a record 16.44% in value on March 18, while the TTF front-month lost nearly 31% over the course of March.

Despite the sharp drop in CO2 prices, the combined-cycle gas power plants are further ahead in the merit order in Germany than rival coal-fired plants, modeling by Energy Brainpool shows. The main reason for this is the likewise sharp fall in gas prices and only a very moderate decline in hard coal prices.

Thermal power plants have higher marginal costs than nuclear or renewables. These days, in fact, wind and solar power cover a rising share of electricity demand which has fallen to record lows due lockdowns to contain the pandemic.

For 2021, Energy Brainpool is assuming a reduction in the average European baseload electricity price of €10.20/MWh, relative to a reference scenario in Q4-2019. "Should there be a recession-related slump in electricity demand, a further loss of an additional €3.60/MWh is conceivable for the year," analysts concluded. ■

U.S. morning peak-load happens later due to lockdown

As the U.S. has become the epicentre of the coronavirus pandemic, grid operators have seen not only reduced weekday electricity demand relative to expectations for this time of year and current weather but also changes in daily electricity usage profiles. The morning peak, for example, is now later and with a more gradual ramp.

The current pandemic and related containment measures greatly change the pattern of electricity usage, which is observed hourly by the U.S. Energy Information Administration's (EIA) Hourly Electric Grid Monitor.

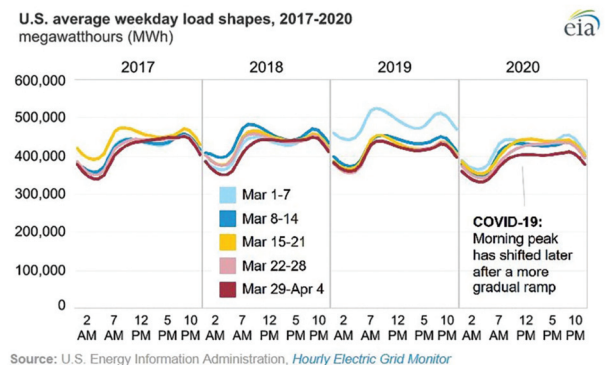
Several regional transmission organizations (RTOs) and independent system operators (ISOs) have reported less electricity demand and a delay in the morning increase (ramp) in the past few weeks as schools, workplaces, and businesses have closed to slow the spread of coronaries.

The the New York ISO (NYISO) reported that "from 6 to 10 a.m., a time when energy use typically ramps up as New Yorkers arrive at work, we are seeing a delay in the timing

of the ramp and a reduction in usage of 6 to 9% relative to typical load patterns. That means energy load is increasing later in the day than normally expected and remaining at a lower level."

Data from Seattle City Light (SCL), near where the first confirmed case of COVID-19 in the country occurred, and Portland General Electric (PGE) show a similar delay and flattening of the typical morning ramp in recent weeks.

In normal times, the electricity demand in the U.S. is highest in the summer, which has a distinct single-peak load shape, and



winter demand typically has separate morning and evening peaks. Spring and fall demand can be particularly volatile when temperatures swing significantly from week to week. ■

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that was up from 90 hours in March 2019. Some renewable power producers are not compensated for negative price periods that

last more than six hours, so the increase could lead to significant revenue losses.

Spain and California worst affected

Persistently high in-feed of renewable energy supply, which is inherently intermittent, poses challenges for power grid operators especially at times of low demand due to industry lockdowns. In fact, coronavirus containment measures have slashed electricity demand in most countries by around 15%, according to the International Energy Agency (IEA)

In Spain and California, where grid operators have to balance a substantially higher share of variable renewables, the lockdown "fast forwarded these power systems 10 years into the future," IEA executive director Fatih Birol commented.

"The abrupt slowdown in industrial and business activity across much of Europe has reduced electricity demand, but it is also depriving power systems of a key source of flexibility," Birol explained. "Under normal circumstances, large-scale electricity consumers such as factories can adjust their usage to help balance the system," he added, "but that option is hardly open today."

Technical advancements allow renewables to also provide some degree of flexibility. Wind power can be gradually ramped down when demand drops late at night. Some solar power can be shut off at noon when there is more than needed. The IEA indicated that "in time, electricity generation from renewables may no longer simply follow the weather but will have to be managed in an intelligent way in order to reduce costs and improve electricity security." ■

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Deal to cut oil production expected to lift prices starting from Q2-2020

OPEC producers and Russia, supported by the U.S. and Mexico, have agreed to cut output by about 10%, or 9.7 million barrels per day, after demand slumped due to coronavirus lockdowns. Though oil prices did not jump in early trading in Asia today, Wood Mackenzie says the supply cuts will lift oil and gas prices "significantly" starting from the second quarter.

Since OPEC and Russia's failure to agree on a production restraint in early March, the implications of lockdowns to contain the coronavirus have sparked a crisis in the oil market as prices fell and supply ramped up. Prices of natural gas, widely linked to oil prices with a three to nine month time lag, are starting to feel the impact as well.

The size of the demand destruction took upstream companies by surprise, squeezing revenues and putting several wildcatters in the United States at the brink of collapse. In fact, Whiting Petroleum has become the first U.S. upstream company to file for bankruptcy.

Efforts to reverse the price collapse in March

US President Donald Trump was alarmed enough to call for OPEC+ to reduce output. Since then Brent prices have increased from a low of \$19 per barrel on 27 March to the low \$30s per barrel as of today. This proves, according to Wood Mackenzie, that the OPEC+'s agreed production cut would be very supportive of price over the second quarter.

"A 10 million barrel per day (b/d) reduction may seem small compared with some very high demand loss estimates," said WoodMac's vice president Macro Oils, Ann-Louise Hittle. But if the curbs are implemented, "it would slow the build-up in storage and avoid the surplus of supply over the second quarter, when the Covid-19 shut-

downs are the extensive and demand lowest. "Even a 5 million b/d reduction would see oil prices in the low \$30s," she noted. "It would ease pressure on storage and stem the steep price collapse we saw in March."

Other analysts disagreed, saying analysts the lack of an oil price jump in early Asian crude markets indicated the oil output cuts were not enough in the current crisis.

Sharpest demand drops to occur in April

With the pandemic spreading in Europe and North America, containment lockdowns are assumed to remain in place throughout April. Assuming lockdowns get lifted slowly in the following several months, analysts expect world oil demand to fall over 8 million b/d year-on-year for Q2-2020.

"April will see the sharpest drop," Ms. Hittle noted, forecasting a year-on-year decline of over 15 million b/d as coronavirus containment measures are at their steepest. Notwithstanding, supply from non-OPEC states kept rising this quarter as some U.S. producers take time to shut in rigs and limit output. By July, US Lower 48 oil output is forecast to be declining at a rate of over 200,000 b/d month-to-month.



"This means Q2-2020 is the most challenging period for producers and the oil market [given that] demand is collapsing and supply is rising," she warned. But there is a silver lining, as China is slowly ending lockdowns and demand seen picking up.

Starting from the second half of 2020 demand is likely to stabilize, with Asian buyers gradually soaking up the extreme oversupply seen in the first half of this year. In Ms Hittle's view, "demand will still be down, year-on-year, but the decline will not be as steep as in the second quarter and supply will start to weaken."

Markets hoped to reverse next year

As for 2021, Wood Mackenzie is forecasting total global supply, including OPEC, non-OPEC, and natural gas liquids, to show no growth for year. Demand, while weak, is projected to rise in 2021 – a sharp reversal from 2020 when demand falls and supply rises. ■

Moody's lowers Henry Hub price to less than \$2/MMBtu

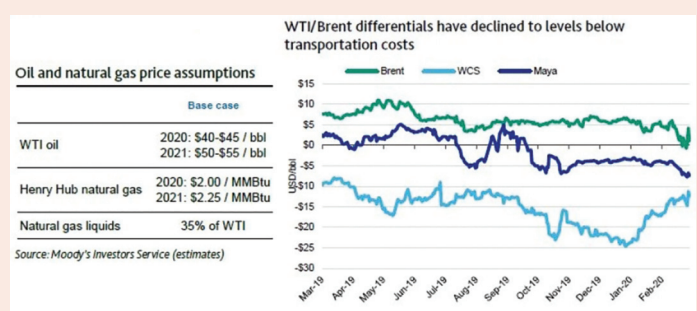
Reacting to the freefall in energy demand due to coronavirus lockdowns, Moody's has lowered its price band for Henry Hub gas to \$2.00-\$3.00 per million British thermal units (MMBtu) for 2020. Analysts said this forecast could be cut further if economic weakness due to the pandemic drags on.

By early 2021, the rating agency expects the global economy will recover and oil prices return to \$50-\$55 per barrel (bbl), recovering from current lows in the \$40-\$45/bbl price range. However, should this outlook on the resilience of the global

economy prove too optimistic, oil and gas prices remain in the doldrums.

"We expect prices to remain low through 2020, before the market rebalances as supplies finally decline," he said. However, Moody's also considers downside scenarios, in which oil and gas prices remain weak into 2021

on the back of longer-than-anticipated economic weakness due to the global health crisis. ■



India's gradual relaxation of lockdown could lift energy demand

India's Prime Minister Narendra Modi has extended the nationwide lockdown until May 3 but allows some graded relaxations. The restart of selected manufacturing after April 20 is seen to be critical to the country's economic stability and the shape of near-term demand of oil, gas, coal and electricity.

The lockdown in India was put in place firmly and forcibly. On 24 March, with only a few hours' notice, the Prime Minister announced the country's \$3 trillion economy was effectively closing its doors for three weeks.

These drastic measures had an immediate effect on India's energy market. At its worst, national power demand collapsed by almost a third year-on-year in late March, with thermal coal consumption dropping by a similar level. Oil and gas demand have fallen by around 20% since lockdown began.

Port operators put in place 'force majeure' to shield themselves against having to offtake long-term LNG cargoes at a time of plunging demand, although energy is deemed an "essential service" by the government. As per the Essential Service Maintenance Act, refineries, power plants and fertiliser production as well as domestic coal, oil, gas and electricity supply remain operational.

'Graded relaxation'

Though PM Modi extended the lockdown for at least another 19 days until May 3, he put in place so-called 'graded relaxations.' Starting from April 20, key industries will reopen and allow workers to return. Upstream operations, mines and refineries have continued operating with reduced labour and are hoping that an uptick in the economy will help them towards increasing production.

The demand outlook for energy deteriorates despite modest relaxation of the lockdown, Wood Mackenzie cautioned. Previous expectation of a decline in electricity demand of 30% up to mid-April now continues into May before improving progressively after this.

"The reduction in power demand will impact most sources of generation," analysts said, though it is worth noting that the Ministry of New Renewable Energy has put all re-



India has extended the lockdown by a fortnight

newables plants on 'must-run' status (unless affecting grid stability) during the lockdown.

Demand deteriorates in Q2

Things will likely get worse before they get better in terms of energy use. Oil demand continues to be hit by an extended lockdown, and low oil prices are also a competitive threat to gas. "High inventories make refiners reduce margins for oil products to compete with gas which can limit LNG demand," analysts explained.

Thermal coal demand, meanwhile, is forecast to fall 25-30% through April and by a further 9% in the second quarter, reducing consumption to 187 million tons in Q2 against the original forecast of 225 Mt. ■

Spot LNG prices in Asia likely to fall below U.S. production breakevens

Though China's economy and gas demand is picking up, the coronavirus pandemic choked energy consumption elsewhere. Delivered gas prices into Northeast Asia today fell below \$2.40/MMBtu, hence Wood Mackenzie warns spot LNG prices in Asia might soon drop below breakeven costs of U.S. upstream companies, causing production shut-ins.

Europe can no longer absorb excess gas supply as economies across the EU juddered to a halt as strict corona containment measures remain in place. An increasingly saturated European gas market has sunk TTF prices today under \$2.30/mmbtu.

'Bleeding cash'

"Any US LNG delivered into Europe this summer in this cost band is bleeding cash," said Wood Mackenzie Asia Pacific Vice Chair, Gavin Thompson, suggesting this situation cannot go on for much longer.

Even the most efficient liquefaction plant in the US cannot support a negative spread between feedgas costs – highly correlated to Henry Hub – and FOB LNG prices (currently around US\$1.60/mmbtu). Prices are now effectively being set by a netback from TTF.

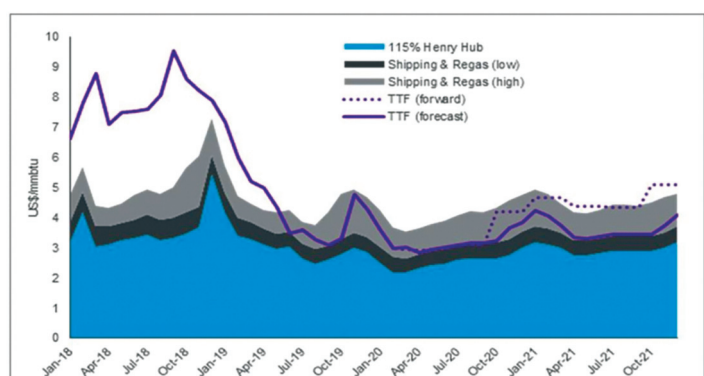
Production shut-ins

Shut-ins of uneconomic production, notably at the U.S. Gulf Coast, is hence seen as the last mechanism to gradually rebalance the market. The WoodMac data supports the argument that this should be happening more, but to date, US LNG liquefaction utilisation has been robust despite the economics of much US supply not being supported by European or Asian gas prices.

"The likely loss of some associ-

ated US gas supply could hurt US LNG producers further," Thompson said, although the impact will only likely be felt by 2021 due to the delayed nature of drilling reductions." ■

US LNG cash cost into Europe



Source: Wood Mackenzie; Henry Hub based on Wood Mackenzie forecast.

Siemens fires up world's first SGT6-9000HL gas turbine

The world's first SGT6-9000HL gas turbine has been fired up at Duke Energy's Lincoln Combustion Turbine Station near Denver, North Carolina. Siemens achieved first fire on April 6, and the turbine is now in full commercial operation at the new 402 MW simple-cycle unit.

The successful first turbine start-up confirms the engine and auxiliary systems – including the gas supply, lube oil system, control system and startup systems – are working together as designed, Siemens noted. During first fire, the SGT6-9000HL ramped up to a pre-determined test speed, and the combustion system ignited.

The SGT6-9000HL is at the heart of a new fast-ramp, simple-cycle gas power unit at Duke Energy's Lincoln station. Siemens

delivered the 340-ton turbine in November 2019, and supervised commissioning of the 402 MW unit.

Four year testing plan

After the first phase of testing is completed, the SGT6-9000HL will continue its four-year testing plan (2020-2024), gradually introducing technologies to achieve the next level of efficiency. The unit will operate in simple-cycle mode under real-world power plant conditions, allowing Siemens to continually assess

and optimize the performance while gaining valuable commercial operating experience.

The architecture of HL-class engines consist of an air-cooled four-

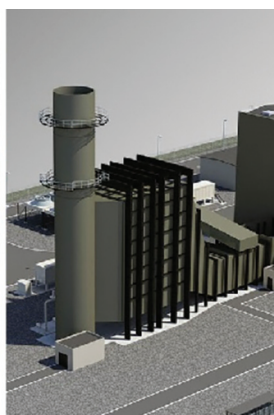
stage power turbine, hydraulic clearance optimization for high-efficiency at full load while facilitating immediate restart. The steel rotor design has Hirth serrations, a can-annular combustion system.

With a ramp-up rate of 85 MW per minute, the turbine maximizes operational flexibility to help integrate fluctuating supply of renewable energy sources. Inspection intervals of intervals of 33,000 equivalent base-hours and 1,250 equivalent starts, mean the unit is highly reliable and has low life-cycle costs.

Hand-over to Duke in 2024

When all testing is completed in 2024, Siemens will turn over the advanced unit to Duke Energy. The unit will be the most efficient of its type in Duke Energy's fleet, generating enough energy to power more than 300,000 homes in the Carolinas.

Investing in natural gas technology will also help Duke Energy close coal plants faster and reach its aggressive goals for cutting carbon emissions by at least 50% by 2030. ■



MHPS starts to commission T-Point 2 to validate JAC gas turbine

Mitsubishi Hitachi Power Systems (MHPS) has begun the commissioning of T-Point 2, its new combined cycle power plant validation facility at Takasago Work, Japan. The CCGT will test the performance and reliability of the 1650°C-class JAC gas turbine and other ultrahigh-temperature models.

The new T-Point 2 replaces the iconic T-Point in order to enable more robust turbine validations, notably the 1650°C-class JAC model and 1700°C-class ultrahigh-temperature models. MHPS claims the T-Point 2, like its predecessor, "stands apart as the only facility in the world that performs full-scale long-term reliability verification for gas turbines."

Commercial start in July 2020

Once commercial operations begin in July 2020, T-Point 2 is expected to achieve power output of over 566 MW at 60Hz, with nearly 64% efficiency, 99.5% reliability and a world-first turbine inlet temperature of 1650°C – raising industry standards for gas turbine combined cycle performance globally. This improved performance is possible due to the upgraded J-Series Air-Cooled (JAC) model, the first gas turbine being validated at T-Point 2.

The new facility features a triple-casing

steam turbine, augmenting overall system efficiency through a multiplier effect with the JAC gas turbine. This greater efficiency reduces carbon emissions and heat loss.

"The prototype validation system established by MHPS has given our customers the clear assurance that they are receiving the highest caliber and most reliable energy solutions in the market," said Junichiro Masada, Senior General Manager of Gas Turbine Technology & Products Integration Division, MHPS.

Going forward, MHPS will use the facility to conduct validation of the next-generation 1700°C-class ultrahigh-temperature gas turbines, steam turbine upgrades, air-cooled condenser technology, generators, and static frequency converters.

Installing AI at T-Point 2

Work is underway to install and train advanced artificial intelligence (AI) technology



View of the new T-Point 2 with T-Point in the background

at T-Point 2, such as the MHPS-TOMONI suite of digital solutions. During the 8,000 hour durability demonstration period, MHPS will also be training its AI apps, allowing T-Point 2 to eventually become the world's first autonomous combined cycle power plant.

The aim is to fully integrate AI into plant operations, allowing plant owners to leverage data to optimize performance, enable condition-based predictive maintenance for equipment, selectively automate operation and maintenance (O&M) decision-making, and reduce risk. ■

Siemens and Uniper promote use of 'green hydrogen'

Germany's largest utility Uniper and Siemens have agreed to jointly produce green hydrogen, derived from renewable energy, for use in Uniper's existing gas turbines and gas storage units. The share of hydrogen co-firing is meant to be gradually increased in both gas- and converted coal-fired power plants.

The focus of the work is to define what role hydrogen can play in the future evolution of Uniper's coal power plants, Siemens stated. Coal-to-gas conversion and subsequent hydrogen co-firing would help substantially reduce emissions at ageing lignite and hard coal-fired plant, allowing extending the life time of these assets.

Net-zero emission by 2035

Complying with the German government's coal exit plan, Uniper agreed to close or convert its coal-fired power plants in Germany and ultimately all of Europe by 2025 at the latest. Uniper's coal-exit plan is instrumental for the utility to reach its goal of

reducing CO2 emissions in the European generation segment from 22 million tons today to net-zero emissions by 2035.

Today, Uniper already produces around 24 terawatt hours of carbon-free electricity with its hydroelectric and nuclear power plants in Germany and Sweden. Under its new strategy it intends to gradually increase the share of 'green hydrogen' in its conventional gas business, in both power generation and energy trading.

Coal-to-hydrogen conversions

"Brownfield transformation" projects, as carried out by Siemens, help decarbonize coal-fired power plants and curb emissions from gas-fired plants, often by adding energy storage solution on site and allowing for hydrogen co-firing.

By building infrastructures for Power-to-X, Siemens is contributing to cross-sector decarbonization. The German manufacturer offers all core technologies for a long-term CO2-free energy supply – from power and heat generation by renew-

able energies or gas-fired power plants, to power transmission and distribution, to efficient electrolysis for hydrogen production.

Power-to-gas technology makes 'green hydrogen' possible has been pioneered by Uniper in its Falkenhagen plant, built in 2013, followed by another one in Hamburg in 2015. Uniper added a methanisation plant to the Falkenhagen plant in 2018 and is now forward cross-sector industrial projects together with refineries and the automotive industry.

"After the coal phase-out and the switch to a secure gas-based energy supply, the use of climate-friendly gas will be a major step towards successful energy system transformation. We are ready to invest, accelerate the decarbonization of our portfolio (...), and act openly in terms of technology by working with partners like Siemens," said Uniper CEO Andreas Schierenbeck.

"We are only at the beginning," Siemens board member Jochen Eickholt cautioned. Brownfield transformation and the design of the green hydrogen value chain can show that a CO2-free energy supply is possible and makes sense under real conditions and using existing plants. "Our future lies in hydrogen. This is what we are committed to as a company," Eickholt underlined. ■



Power-to-X technology can help decarbonize the economy

Costs for green hydrogen keeps falling

New technologies to produce green hydrogen will allow for 34% of global emissions to be cut "at manageable cost," Bloomberg New Energy Finance finds. Excess renewable energy can be turned into hydrogen at \$0.8 to \$1.6/kg in most parts of the world before 2050, which would make it competitive with gas prices in Brazil, China, India and Germany.

Factoring in the cost of storage and gas pipeline infrastructure, the delivered cost of renewable hydrogen could fall to around \$2/kg in 2030 and \$1/kg in China, India and Western Europe by 2050. In this event, green hydrogen would effectively outcompete both coal and natural gas as a fuel for power generation.

Clean fuel for energy-intensive industries

Today, some 70 million tonnes of hydrogen are already used for oil refining and in the petrochemical industry worldwide. Falling costs for hydrogen would spiral up the use

of that clean fuel and help decarbonizes some of the most energy-intensive industries.

However, a decisive build-out in electrolyzers to get hydrogen produced in sufficient quantities will require a determined push by policymakers, BNEF underlined. "The clean hydrogen industry is currently tiny and costs are high. There is big potential for costs to fall, but the use of hydrogen needs to be scaled up and a network of supply infrastructure created," said Kobad Bhavnagri, head of industrial decarbonisation for BNEF.

"This needs policy coordination across government, frameworks for private investment, and the roll-out of around \$150 billion of subsidies over the next decade," he forecast. ■



Shanghai Electric's first CCGT in Bangladesh starts operation

Shanghai Electric has commissioned its first combined-cycle power plant in Sylhet, eastern Bangladesh, on behalf of the regional Power Development Board (PDB). The project entailed the upgrade of a 150 MW open-cycle gas power plant unit to a 225 MW combined-cycle unit.

The start of commercial operation of the Sylhet CCGT increases Bangladesh's overall electricity output by 640 million kWh per annum, helping to meet the rising power demand in the country's industrial eastern region. Sylhet's hinterland is home to the country's largest gas fields, allowing the power plant operator to rely on domestically produced fuel.

Works to retrofit the gas turbine generator technology had been carried out under an Engineering, Procurement and Construction (EPC) contract, awarded by the plant operator PDB. Shanghai Electric noted it had been chosen to carry out the plant conversion after having "built solid experience through overall five projects in Bangladesh so far since 2002."

Leveraging GVPI technology

As part of the upgrade, the power plant has been equipped 100 MW global vacuum



pressure impregnation (GVPI) air-cooled generator which helped increase the plant's capacity by 90 MW. It also improved the efficiency of the original plant's simple, open-cycle application from 33% to 55%, Shanghai Electric noted.

"We are always looking ahead to anticipate the client's needs and improve the availability, reliability and efficiency through

a customised solution designed for different regional markets," said project chief engineer Wang Yi.

In the eight years prior to the upgrade, the plant has provided 8.19 billion kWh of electricity

to Bangladesh's national grid and this figure is estimated to increase by 640 million kWh on an annual basis.

Sylhet was Shanghai Electric's fourth EPC project in Bangladesh, initiated under the "One Belt One Road" Initiative, following the Barapukuria thermal power plant. During the construction period, the Chinese developer hired 500 local workers.

Gazprom carries out major investments for Eastern Gas Program

Russia's Gazprom is fast-tracking major investments within its Eastern Gas Program to ramp up production and gas transmission capacities from Siberia to China. In Yakutia, Gazprom is working to bring the Chayandinskoye gas field to its design output of 25 Bcm and expand the gas treatment unit that feeds into the Power of Siberia interconnector.

Production drilling is in full swing at the Kovyktinskoye field in the Irkutsk Region. Seven drilling rigs are currently in operation, and their number is going to be raised to 18 next year, Gazprom announced, indicating there will be plenty of supply to ramp up 'Power of Siberia' gradually to 38 Bcm per year, as planned, by 2025.

To boost gas exports to China, Gazprom is striving to complete the second compressor station on the 'Power of Siberia' pipeline this autumn. Construction of the pipeline section between Kovyktinskoye and Chayandinskoye will also start in the third quarter of this year.

Amur GPP almost two-thirds complete

Progress on the Amur Gas Processing Plant (GPP) construction project is at 58 percent complete. With a design processing capacity of 42 Bcm/year, the Amur plant will be essential to ramp up throughput of the

China interconnector.

Installation of the core equipment of the first and second production trains is nearly finished, Gazprom noted, and said equipment is being prepared for start-up and commissioning. Meanwhile, gas separation equipment is being installed on train three and four.

To power the Amur GPP, Gazprom is building a new 160 MW combined-cycle power station called Svobodny TPP which is scheduled to start up in late 2020.

New focus on Northern Gas Corridor

The Russian arctic, notably the Yamal Peninsula is another key focus of Gazprom's up-



stream efforts. This strategic oil- and gas bearing region has explored gas reserves of 16.7 trillion cubic meters, where Gazprom seeks to achieve an annual output of 310–360 billion cubic meters of gas. To this end, 52 new gas wells will be brought onstream at the Bovanenkovskoye field as well as a connecting pipeline, stretching to the Kharasaveyskoye field.

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