



ETN looks into ammonia and hydrogen co-firing of CCGTs

Partners of the European Turbine Network (ETN) are looking to flexibilize combined-cycle power units by partly running them on green hydrogen or ammonia. Energias de Portugal (EDP) will demonstrate the concept of hydrogen co-firing at its Ribatejo power plant.

To develop such Power-to-X-Power solutions, ETN and its cooperation partners have embarked on the FLEXnCONFU project, short for FLEXibilize combined cycle power plant through Power-to-X solutions using non-CONventional Fuels.

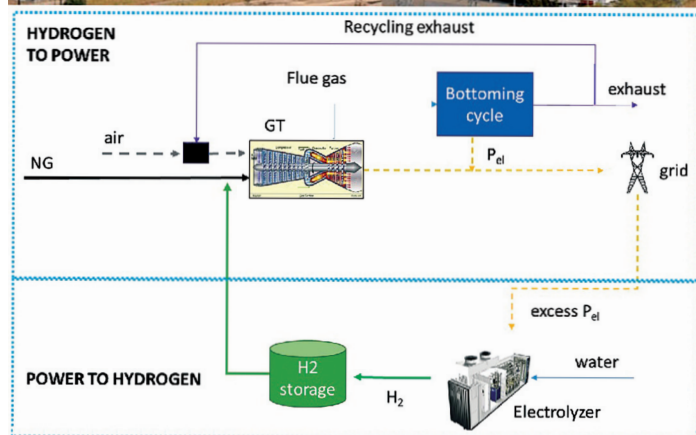
The project has a total budget of 12.6 million Euros and runs from April 2020 to the end of March 2024.

The new FLEXnCONFU layout is improving the fuel flexibility of gas-fired power plants and their overall efficiency. It can be retrofitted to combined heat and power units, flexible combined-cycle units or integrated coal gasification unit.

Trials start in March 2023

To demonstrate the economically viable solutions, EDP will install a Power-to-Hydrogen system in a real operating environment at its Ribatejo gas-fired power plant (3 x 392 MW), situated some 30 kilometers northeast of Lisbon. The three units, powered by Siemens V94.3A

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EDP's Ribatejo power plant near Lisbon

Germany counts on green hydrogen in quest for zero emissions

Aspiring to become climate-neutral by 2050, the German government is supporting clean hydrogen technologies both at home and as a future export success for the country's engineering companies. "Green hydrogen is tomorrow's oil," the German research ministry noted, stressing the flexible energy carrier "opens up new markets."

As Berlin is handing out generous stimulus packages to revive the economy after crippling coronavirus lockdowns, policy makers are funneling funding into research for electrolyzers. Green hydrogen, produced through electrolysis from excess renewable energy, is seen as a silver bullet for sectors with particularly stubborn emissions, such as heavy industry and aviation.



Hydrogen electrolyzer by Sunfire

Job machine

The government hopes Germany could create hundreds of thousands of jobs by the middle of the century if it can hold onto its current share of the global market for electrolyzers that produce

hydrogen, which stands at around 20%.

A highly anticipated National Hydrogen Strategy is due to be approved by the government in the coming week. But key questions are still open such

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gas turbines in single shaft configuration, have a combined capacity of 1.176 MW.

Installation and commissioning of the developed technologies at Ribatejo plant will start in September 2021. Siemens, the sub-contractor for the project, will handle the retrofit of the combustion chamber as other components. Trial runs to demonstrate the hydrogen co-firing are scheduled to start in March 2023.

Co-firing reduces Opex

Hydrogen and ammonia, produced at low

cost from excess supply of wind and solar power, can be stored and used as a cheap fuel by retrofitted combined-cycle gas power stations. Co-firing capability reduces the plant's operating cost which can help increase their current low operating-hours.

To level the combined-cycle load, excess thermal electricity can also be converted into hydrogen or ammonia for re-use in the same power plant, if and when needed to respond to varying demand.

At the same time, a Power-to-Ammonia system will be installed at a micro gas tur-

bine operating in a smart grid context at the Savona lab. In addition, tests with up to 100% ammonia co-firing at a heavy-duty gas turbine will be performed at Cardiff University's combustion lab.

The consortium behind the FLEXnCONFU project is led by RINA Consulting. Partners include EDP, Backer Hughes, Cummins affiliate Hydrogenics, Proton Ventures, Tirreno Power, ENGI Laborelec, ICI Caldaie, MAS Advanced Technologies for Power and Energy as well as several European research institutions. ■

Oil prices plunge 16%, dragging down prices of natural gas

West Texas Intermediate (WTI), the U.S. benchmark oil price, has shed 16.12% in early trading today, extending Monday's losses of nearly 25% as the pandemic erased about a third of global oil demand and storage fills up fast. Henry Hub spot gas price fell to \$1.65/MMBtu, near parity to the British NBP.

WTI front-month June was last seen trading at \$10.20/bbl, while the comparative Brent front-month eased to \$19.12/bbl.

Analysts said the WTI plunge was largely caused by a sell-out of the front-month June contract by exchange-traded funds (ETFs), which buy into months later in the year in a bid to avert massive losses in the event that WTI prices again turn negative. On April 20, the WTI closed at a record low of -\$37.63/bbl.

Gas prices could go lower

Forward gas prices in Europe, notably at the liquid Dutch TTF hub, slumped to record lows as both Norway and Russia continue supplying pipeline gas while distressed U.S. LNG cargoes are also looking for a home in Spain, France or the UK.

Natural gas, still largely sold under oil-indexed contract, will follow the low oil prices with a three to six month time lag. Triple whammy of weak demand, unbridled production and exhausted storage capacity keeps gas prices subdued despite the cautious lift of



lockdowns in some key European economies.

Energy Aspects warns the bear market is bound to continue until markets are balanced, probably after summer. "There comes a point when everything starts looking unprofitable, but prices could go lower," lead analyst Trevor Sikorski said. ■

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as the volumes of green hydrogen Germany is aiming to produce, and whether hydrogen produced with controversial carbon capture

and storage (CCS) should be supported for a transitional period.

Researchers and industry are keen for Germany to become a global technology leader in "tomorrow's oil" by beating Asian countries. We must seize the unique opportunity to use our know-how to become the supplier of a global energy transition," the research ministry stressed.

Industry supportive

Germany's export-driven industry has also become a cheerleader for hydrogen. Ramping up this technology internationally would be "a success both in terms of climate policy and industrial policy," according to Germany's industry association BDI, which insists that "the current hydrogen hype is justified."

Steelmaker ThyssenKrupp and the chemicals group BASF have detailed plans for cut-

ting emissions, but lack viable business models to implement them - not only because green hydrogen is still too expensive, but also because massive investments are required to enable its use on a large scale.

The industry said in a study it could become largely greenhouse gas neutral by 2050 with additional investments of around 45 billion Euros. But it would need more than 600 Terawatt-hours (TWh) of electricity per year from the mid-2030s - more than Germany's entire current power production - mainly to produce hydrogen and other renewable fuels.

To become carbon-neutral by 2050, Germany will eventually have to replace natural gas in its energy mix with clean hydrogen. Technology costs would have to fall substantially, possibly supported by investment subsidies, to make green hydrogen an economically viable option. ■

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Pandemic may cause up over 17 Bcm of lost gas demand across Europe

As lockdowns are gradually eased in Europe, gas demand stages a cautious recovery. If the current coronavirus restrictions persist for three months, Wood Mackenzie expects 17.6 Bcm of demand will be lost across seven of Europe's largest gas markets: Germany, UK, Italy, France, Spain, Netherlands and Belgium.

Prior to the pandemic, analysts had forecast gas demand of 371 bcm in 2020 for these markets, which together account for 70% of European gas demand.

In Germany, Europe's largest gas market, industrial demand initially proved relatively resilient. However, this has lost momentum since country-wide social distancing restrictions and lockdowns in some states were introduced. "Overall, demand is set to drop by 3.5 Bcm if the current restrictions last for three months," forecasts Murray Douglas, from Wood Mackenzie's European gas team.

In the UK, the second-largest gas market, electricity demand has reduced by 14% since the start of the lockdown. "As coal is uncompetitive in this market, lower electricity demand poses a disproportionate risk to gas. We currently expect 2.6 Bcm of lost gas demand if the lockdown lasts for three months," Douglas said.

Italy, hard hit by the pandemic and sub-

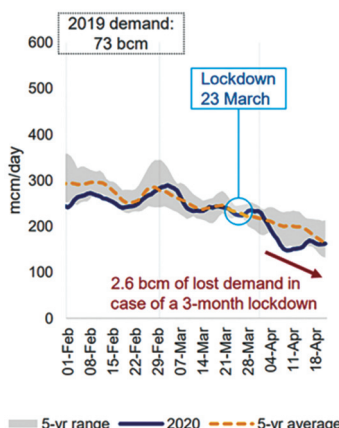
sequent lockdowns from March 10, is forecast to experience Europe's largest loss of gas demand, reaching 4.4 Bcm. Though the nationwide lockdown has been extended to 3 May, some small retailers have re-opened and some manufacturing has returned. WoodMac figures show there is already a clear rebound in gas and electric demand over the last week".

Supply keeps coming from Norway and Russia

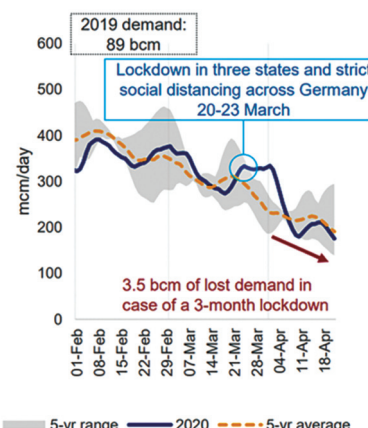
Despite the demand destruction due to the pandemic, European gas producers have delivered only minimal adjustments so far. Northern Europe is drowning in gas as Russia and Norway compete for market share.

Break-even costs at the biggest fields of Equinor, formally Statoil and StatoilHydro, are as low as \$1/MMBtu.

Gas demand – UK



Gas demand – Germany



However, with European hub prices remaining low, some operators will face challenges in covering even their short-run marginal costs. For now, some of Europe's legacy pipeline suppliers are falling below 2019 levels.

Pressure builds on LNG as storage fills fast

"By the end of March, Europe had a record 57 Bcm gas in storage, further weakening an already oversupplied summer market," Douglas noted.

"Attention is turning to Ukraine's gas storage facilities as a potential solution," he said. "Additionally, we are likely to see increased pressure on LNG suppliers to the European market – most notably from the U.S." ■

European power prices unlikely to recover until 2025

Electricity use in Europe increased for the first time in eight weeks as lockdowns are lifted, Entso-E data shows, but prices remain in the doldrums. Wholesale power prices collapsed 30-40% in the wake of the pandemic and may not fully recover until 2025, Aurora Energy Research finds.

A mild Covid-19 scenario could see power prices recover already by 2022, while a severe recession caused by the pandemic would keep prices in the doldrums for another five years. Factors taken into accounts in these scenarios are the duration of lockdowns and implication on energy demand, commodity prices and project financing.

Power markets with a large contribution of gas-fired generation are seen hit harder by the recent fall in commodity prices.

"The effect of Coronavirus has rippled through European energy markets – significantly reducing demand and prices of gas and electricity," Felix Chow-Kambitsch, head of commissioned projects- Western Europe at Aurora said, suggesting "European power



utilities are likely to experience a significant fall in revenues in 2020."

Slow recovery

Europe's electricity demand is seen slowly recovering as lockdowns are gradually lifted

in Germany and Spain, while Italy will follow in a weeks' time. Power demand notched up as a consequence, with EU's total power load rising week-on-week to 49.97 terawatt hours over the past week.

But electricity demand was still 7.5% below the same week last year, while the previous week it was 13.5% lower from 2019 levels.

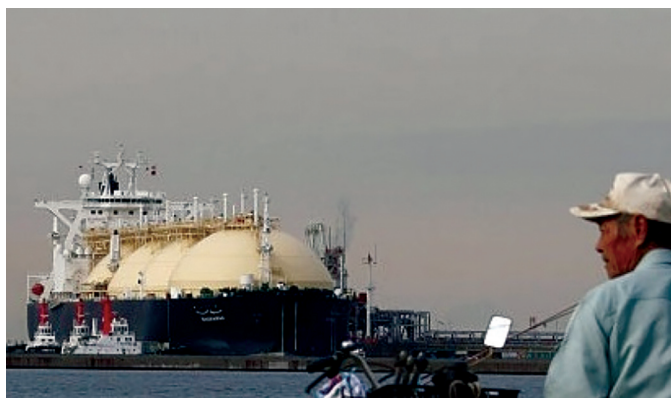
"The worst is over in terms of hits to demand," said Elchin Mammadov, an analyst at Bloomberg Intelligence. "Most utilities have written 2020 off. The recession is a bigger problem than weekly fluctuations in demand. We could see another drop later in the year." ■

Japan at risk of power shortages as only two weeks of LNG in stock

JERA, Japan's largest LNG importer and electric utility, is trying to avert shortages of power supply as only two weeks of LNG remain in stock due to lockdowns to contain the coronavirus. With much of nuclear baseload capacity offline, supply security hinges on gas-fired power.

Striving to mitigate the risk of blackouts, JERA has put in place emergency measures to keep LNG flowing to keep system-critical power stations operational.

"We have multiple measures to maintain a stable supply even if the infection spreads," the Japanese financial daily Nikkei cited a JERA official. "If commuting becomes too risky, employees will sleep at the power station."



LNG tanker arriving at Japanese port

Shipments with LNG cargoes still arriving "constantly", he said but admitted if a few shipments were to be missed this could herald "an extended [electricity] cut-off."

Nuclear gives no leeway

Japan has already faced a power shortage this year, and given that the number of nuclear power stations in operation is set to fall from nine to four or five, Japanese utilities have little leeway as they cannot rely on nuclear baseload power.

Tokyo Electric is understood to be rushing to restart its Kashiwazaki-Kariwa nuclear plant in Niigata Prefecture because the heavy concentration of LNG-fuelled power plants makes the region vulnerable in the event of gas supply shortages.

Should gas stock run low, the region would be

the first to experience power cuts.

Before the Fukushima disaster in March 2011, Japan had over 50 nuclear plants in operation but now has to make do with a tenth of that power. The Sendai reactor was shut down in March 2020 as it failed to meet anti-terrorism charges, Itaka nuclear unit 3 is offline due to a court injunction, and the Genkei reactor was shut after a contractor tested positive for the coronavirus.

Tokyo Bay heavily reliant on LNG

A stable supply of regasified LNG to operate gas-fired power units has become system-critical to keep the lights on, especially in Tokyo Bay which stretches around the prefectures of Chiba, Tokyo and Kanagawa. The highly industrialized region is Japan's prime LNG hub and a centre of gas-fired power generation.

The LNG needs of these Tokyo area power plants account for 30% of Japan's total gas-burn, producing 26 million kilowatts (kW) of electricity. Many of these gas power units are operated by JERA.

Wind and gas generators lead additions of U.S. power gen capacity

Most added power gen capacity in the United States are either gas-fired or renewables. Nearly 23 GW of new capacity came on-stream last year, led by onshore wind (9.1 GW), gas-fired units (8.3 GW) and solar photovoltaic (5.3 GW). Half of the additions are in the South region.

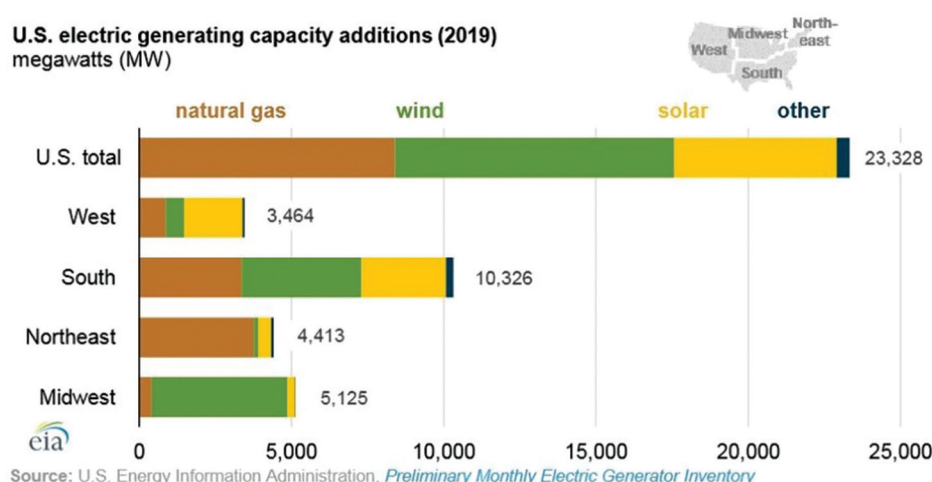
In the Northeast region, access to abundant natural gas supply from the Marcellus and Utica shale plays in Pennsylvania and Ohio has led to increases in natural gas-fired power plant capacity.

Similarly, access to high quality wind resources in the Midwest region has led to increases in wind capacity. In both cases, these additions have replaced coal-fired capacity. Nearly 14,000 MW of coal-fired capacity was retired in 2019—the third-most annual coal retirements in EIA's power plant inventory.

Although total electricity generation across the United States has remained relatively flat since the mid-2000s, power plant installations have continued to increase in the past decade, partly to replace retiring coal-fired plants.

Low natural gas prices, a rapid decline in construction costs for solar and wind sys-

U.S. electric generating capacity additions (2019)
megawatts (MW)



tems, and an increase in renewable portfolio standard requirements in many states have led to more generation from natural gas-fired and renewable resources in many regions. In 2010, coal was the predominant

source of electricity generation in the United States as a whole and in every region except the Northeast.

In 2019, coal was the most-used electricity generation source in only the Midwest.

Coal finance further restricted as demand falters

Banks accelerate their exit from coal financing as the credit appeal of mining and coal power plants deteriorates amid faltering electricity demand during the pandemic. Japan's Sumitomo Mitsui Banking Corp (SMBC) and Mizuho Financial Group head for the exit, followed by South Africa's ABSA bank and Citi Group.

The rate of significant banks, insurers and asset managers/owners announcing coal restrictions has seen a step rise to reach 127 institutions. Citi, for example, will no longer provide project-related financing for new thermal coal mines and has pledged to halve its coal credit exposure from a 2020 baseline by 2025, and cut it to zero by 2030.

BlackRock, the world's largest asset manager, made a landmark announcement in January 2020 to divest thermal coal mining exposures from its \$1.8 trillion of actively managed funds. Since then, a further 20 players followed suit and pledged to gradually exit coal financing.

China – lender of last resort for coal power plants

The global renewable energy champion China is simultaneously funding over one-quarter of coal plants currently under development outside the country. China has committed or proposed about \$36 billion in financing for coal-based projects in 23 countries. Most ventures are based in Bangladesh, Pakistan, Vietnam, Indonesia and South Africa.

State-controlled Chinese banks have offered funding for over one quarter, or 102 GW of the 399 GW of coal-fired power generation capacity that is currently under development outside China. Projects include investment in export coal mines, coal-fired power plants, and the associated rail and port infrastructure.

Tide turns to renewables elsewhere

Renewables are now the low cost source of energy, and they have near zero carbon im-

pact on our warming planet. IEEFA expects the deflation of renewable energy costs to continue for the coming decade, accelerating the realisation of stranded asset losses for aging and obsolete coal-fired power plants, and other fossil fuel technologies.

Governments and corporate leaders are also moving away from coal. President Moon Jae-in of South Korea has reiterated his Green New Deal to cease coal financing globally, while Shell, Total and BP pledged to move into zero emissions electricity generation.

It appears that coal power generation actually peaked in 2018, analysts noted. There was an unprecedented and unexpected 3% decline in coal-fired power generation globally in 2019, they said, suggesting it is now set for a second consecutive decline in 2020.

India tenders for solar PV

In India, the third largest economy in Asia-Pacific, the cost of renewable energy is now 20-30% lower than the cost of a new domestic coal-fired power plant, and 50% below that of a new import-reliant coal power plant. Even as electricity demand has collapsed 27% this month to-date, the Indian government announced the awarding of a \$2 billion, 2 Gigawatt (GW) solar tender at a near record low price of Rs2.55/kWh or \$33/MWh.

"Renewables are clearly the low cost, zero inflation, zero emissions source of new domestic electricity supply for India," IEEFA analysts noted. ■



View into a coal mine

NEWS NUDGES

U.S. adds 8.3 GW gas-fired capacity

The electric power sector in the United States has installed nearly 23,000 MW of new generating capacity over the course of the past year. Onshore wind made up the lion's share (9,100 MW), followed by natural gas-fired (8,300 MW), and solar photovoltaic (5,300 MW) technologies. The South region of the U.S. is home to nearly half of these capacity additions.

April 'bleakest month' for oil

Demand destruction due to the coronavirus pandemic is forecast to pull down global oil demand by a record 9 million barrels a day in 2020, erasing almost a decade's worth of growth. The International Energy Agency (IEA) expects April to be "the bleakest month for the industry," with demand set to plummet by 29 million barrels a day.

China's fuel demand to rebound in Q2

China's demand for refined fuel is forecast to rebound in the second quarter, nearly reaching year-ago levels, as lockdowns to contain the coronavirus get lifted. Analysts at SIA Energy in Beijing expect second quarter demand for the three main transportation fuels to increase by 1.1 million barrels per day compared with the first quarter of 2020. ■



Coal mining in Queensland's Bowen Basin

DOE hands out \$28 million in R&D grants to develop ultrahigh temperature turbine materials

The U.S. Department of Energy has freed up \$28 million in funding for research on ultrahigh temperature materials that can operate in high temperature and high stress environments of a gas-turbine blade. Novel alloys and coatings are meant to further enhance turbine efficiency.

Turbine blades are currently made of single crystal nickel (Ni)- or cobalt (Co)-based superalloys. After many years of refinements, their development has plateaued. Researchers are hence trying to leverage and integrate recent advances in alloy design and modeling, refractory alloys, advanced manufacturing technologies, and high-throughput testing to realize significant improvements in the operational capability of gas turbines.

Turning up the heat

The temperature capability of current state-of-the-art blade materials has improved steadily over the last few decades to 1100 °C, through incremental microstructure and chemistry refinement.

The ULTIMATE program targets enabling gas-turbines blades to operate continuously at 1300 °C in a material test environment—or with coatings, with turbine inlet temperatures of 1800 °C or higher. ULTIMATE stands for Ultrahigh Temperature Impervious Materials Advancing Turbine Efficiency, and is part of the ARPA-E program series.

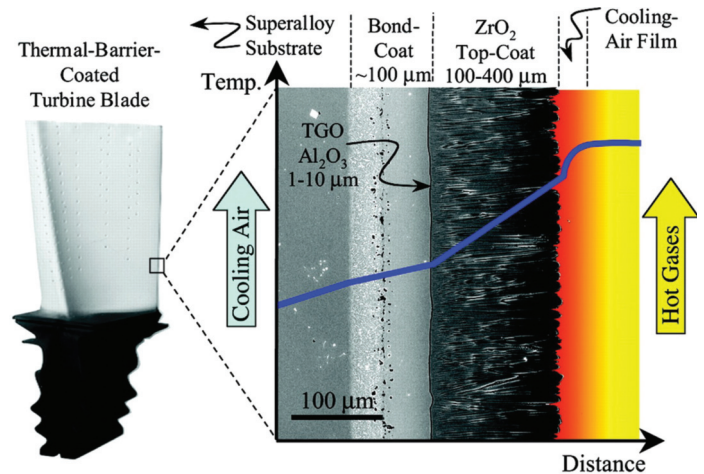
The use of novel materials can boost temperature and potentially increase gas turbine efficiency up to 7%, improving power plant economics. By 2050, such a 7% efficiency improvement in gas turbines used for U.S. electricity generation could save up

to 15-16 quads of energy, researchers said. For aircraft turbines the energy savings could be 3-4 quads.

Research will be conducted in two phase, covering proposed for a maximum of 18 and 24 months. In phase I, project teams will demonstrate proof of concept of their alloy compositions, coatings, and manufacturing processes through modeling and laboratory scale tensile coupon (sample) testing of basic properties. In phase II, approved project teams will investigate selected alloy compositions and coatings to evaluate a comprehensive suite of physical, chemical, and mechanical properties as well as produce generic small-scale turbine blades to demonstrate manufacturability.

Propping up manufactures

Natural gas turbines currently produce an estimated 35% of the electricity generated across the United States. The DOE research grant can help turbine developers to trial and commercialize new turbine coatings to



Scheme of thermal barrier coated turbine blades

enhance their sales in the current difficult economic environment.

According to ARPA-E Director Lane Genatowski, the novel ultrahigh-temperature alloys in conjunction with coatings are meant to boost efficiency of gas turbines, used both for power generation and aviation.

"Developing new, innovative technologies under the ULTIMATE program will allow us to better utilize gas turbines across multiple power sectors, from electricity generation to transportation and aviation," said DOE Undersecretary of Energy Mark W. Menezes. In the long-run, the DOE-aided research is meant to help "making all of these industries more efficient," he concluded. ■

MHPS achieves top market share for FGD systems

Mitsubishi Hitachi Power Systems has achieved a market share of 37.2% market share for flue gas desulfurization (FGD) by delivering systems with a combined output of 51,010 MW, according to the McCoy Power Report. FGD systems are installed in

thermal power generation units with output of 5 MW and above.

By consolidating power plant technologies of Mitsubishi Heavy Industries (MHI) and Hitachi, MHPS has developed an integrated Air Quality Control System (AQCS) comprising FGD, Selective Catalytic Reduction (SCR) for denitrification, and Electrostatic Precipitator (ESP) for dust collection systems.

Yokohama-based MHPS claims it is the "world's only manufacturer able to independently offer proposals and provide these [above-mentioned] systems." The company's centralized ap-

proach allowed it to develop and mass-produce technologies that greatly reduce air pollutants such as sulfur oxide (SOx), nitrogen oxide (NOx), and particulate matter.

MHPS has delivered more than 300 FGD systems to the global market. "We have expanded the business by providing technologies and guidance in countries where demand for advanced Air Quality Control Systems (AQCS) has risen alongside economic development, and applied these technologies in joint projects with Mitsubishi Shipbuilding," the company stated.

Going forward, the Japanese manufacturer wants to focus on the widespread adoption of AQCS, accurately assessing customer needs and promote the decarbonization of energy markets. ■



FGD system for Kozenice power plant in Poland

Azito power plant extension project attracts MIGA guarantees

Multilateral Investment Guarantee Agency (MIGA) has issued guarantees worth \$74.6 million to Globaleq for its equity investment in Phase-4 expansion of the Azito power plant in Ivory Coast. The expansion will increase the capacity of the combined-cycle plant by 253 MW to a total of 710 MW.

MIGA provides political risk insurance for energy projects, helping investors in developing countries to tap debt finance. The guarantees for Globaleq Holdings protect the investor against the risk of breach of contract (BoC) by the Government.

Insulating against political risk

Globeleq CEO Mike Scholey underlined MIGA's Breach of Contract cover provides comfort and risk mitigation to enable the company to continue supporting the project. Developers had taken Financial Investment Decision (FID) on Azito Phase-4 in January, backed by a \$310 million financing package arranged by the International Finance Corporation (IFC) and other development banks.

"Amid rising concerns about the impact of the COVID-19 pandemic and stagnating

foreign direct investment flows to the Ivory Coast, this transaction reflects an ongoing commitment by investors to ensure reliable and low-cost provision of electricity to consumers," said MIGA's executive vice president, Hiroshi Matano.

Flexible and cheap electricity for RES backup

The 253 MW expansion of the Azito CCGT will be achieved by adding a new GE gas turbine and a new steam turbine to the existing Azito combined-cycle power plant. An additional GT13E2 MXL2 gas turbine upgrade will boost the capacity of the combined-cycle plant from 460 MW currently to 713 MW, equaling about 30 percent Ivory Coast's total capacity installed.

According to the Globeleq CEO, the Phase-4 expansion project will "supply the cheapest electricity in Ivory Coast using the latest, most efficient technology." The flexible new unit will enable the West African country to integrate more intermittent wind and solar power sources to the grid, while exporting surplus electricity to neighbouring countries.

Azito Energie, founded in 1997, is owned by Globeleq Generation Ltd and Industrial Promotion Services. The CCGT, located in the Yopougon



View of Azito CCGT in Ivory Coast

Kawasaki HI orders MAN dual-fuel engines for Japanese power plant

Kawasaki Heavy Industries has commissioned MAN Energy Solutions to supply two 12V51/60 dual-fuel engines for the Miyako Island power plant, owned and operated by the Okinawa Electric Power. The order prompts the very first installation of dual-fuel engines in Japan.

Capable to run on diesels and natural gas, the 12V51/60 engines will generate around 24 MW of electrical power in its role as the primary base-load provider at Miyako, a small Japanese holiday island with 50,000 inhabitants.

"Our engines will mainly run on natural gas but, due to their dual-fuel capability, also offer maximum fuel flexibility and reliability. This is highly important for independent power supply for remote islands such as Miyako," explained Martin Höhler, MAN head of sales in the Asia Pacific.

The versatility of dual-fuel engines is beneficial for supplying remote regions with reliable and independent energy, he said. The customer Kawasaki HI is one of MAN's "longest-standing partners," Höhler pointed out, "with a shared business history dating back to 1911."

Okinawa Electric Power had some years ago installed two 18V48/60B engines at a power plant on the neighboring island of Ishigaki. ■

district of the Ivory Coast, is run under an operation and maintenance agreement between Azito O&M and Azito Energie. ■

GE completes inspection on SGT-800 turbine at Ufa TPP-1 in Russia

General Electric has modernized Bashkir Generation's TTP-2 combined-cycle power plant (519 MW) and completed an inspection and repair of the Siemens SGT 800 turbine. GE's Cross-Fleet Solutions unit injects the company's proprietary technology into other equipment manufacturers' (OEM) units, effectively adopting them into GE Services' installed base.

Inspection works included the repair of several key components of the power unit, notably components of the combustion chamber. The overhaul extends the overhaul interval of the SGT 800 turbine by 25%, which is equivalent to approximately seven months of operations.

The 519 MW power plant, one of the largest in Bashkortostan, provides heat to more than half of the residents and industrial facilities in city of Ufa, with more than 1 million inhabitants. The upgraded plant allows the operator Bashkir Generation's better cope with Russia's winter season, which

typically lasts from October until May.

Onsite works were carried out by the GE Energy Technology Center in Kaluga, situated some 150 kilometers south of Moscow.

Spare parts warehouse in Kaluga

GE's Cross-Fleet Solutions offering provides an increase of maintenance intervals for Siemens' SGT-800 units of up to 40,000 hours/900 starts, enhancements to plant output by up to 6% and efficiency by up to 1.5% (depending on the turbine rating). Most of the maintenance is carried out in the GE Energy Technology Center in Kaluga,

where GE also has a localized SGT-800 spare parts warehouse to ensure the availability of its key components and provides the possibility of replacing them promptly – up to within 24 hours. ■



Bashkir Generation's TTP-2 power plant

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