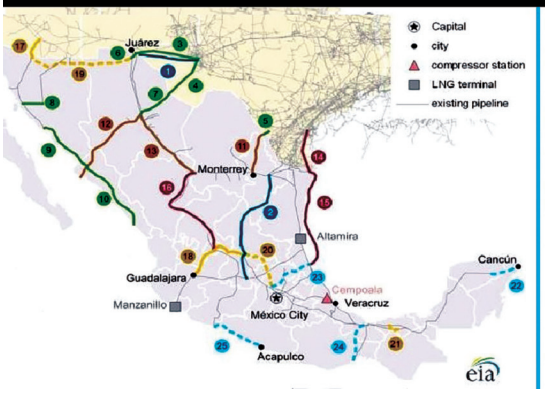
Gas to Power Journal
Peakload Power and Energy Storage

Weekly News 31 July 2020

# Late July, August seen as "litmus test" for U.S. gas demand recovery

**Natural gas demand in the United States has plunged over Covid-related lockdowns but analysts say "late July and August will be a litmus test for just how much industrial demand has recovered." August is a month without a U.S. federal holiday, so baseload demand might return to "more normal levels."**




| Week ending: Fri - 24 Jul 20 | | | |
|---|---|---|---|
| Power | 47.4 | 4.0 | ↑ |
| ResCom | 8.7 | (0.2) | ↓ |
| Industrial | 19.2 | 0.1 | ↑ |
| Other | 5.1 | (0.1) | ↓ |
| To Mexico | 5.8 | (0.1) | ↓ |
| LNG Exports | 3.2 | (0.1) | ↓ |
| **Demand** | **89.4** | **3.5** | ↑ |
| *Storage change* | 1.8 | (2.8) | ↓ |

Source: Energy Aspects

Energy Aspects' modelling sees U.S. industrial gas baseload demand slowly climb toward 19.4 billion cubic feet per day (bcf/d) through the end of August – up from a low near 18.8 bcf/d in early May at the height of the health crisis.

"We expect part of the recovery to stem from refinery utilisation, which spiked back to 78% in the week ending 3 July, the highest level since March," said Energy Aspects' head of North America Natural Gas, Nina Fahy.

"According to our flow data, this is helping support Gulf Coast industrial demand, with Texas and Louisiana industrial gas use up by 6% month-on-month," she explained. However, built into that 6% recovery is the impact of outsize heat on operations in West South Central.

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# Ansaldo wins €100m contract for 300 MW peaking plant in Germany

**EnBW, the regional utility in Baden-Württemberg, has awarded a 100 million contract to Ansaldo Energia to design, supply, install and service a 300 MW open-cycle power plant (OCGT) in the southern German city of Marbach. The peaking power plant is due operational by October 2022.**

Situated in Marbach at the banks of the river Neckar (pictured), the peaking power plant will help balance the regional grid. The OCGT will be equipped with an AE94.3A gas turbine, the related generator and the auxiliary systems.

The contract award is part of Germany's special network reserve project under which tenders were issued in four areas of southern Germany.

A part of these tenders, Ansaldo Energia has also been awarded an EPC contract for the Irsching gas peaking plant in southern Bavaria. The second order win from EnBW confirms Ansaldo's presence in the German balancing market segment.

The Italian manufacturer sated it is "proud to support EnBW in its efforts to provide reliable electricity and a stable grid in the framework of massive and constantly growing use of renewable energy." ■

*Render of the 300 MW Marbach gas peaking plant*

## AGENDA

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Hence, the hopes for a swift U.S. economic recovery cannot be pinned on growing manufacturing activity alone.

## Industrial energy demand picks up slowly

As the U.S. and Mexican car manufacturing sector regains speed, natural gas exports from Texas to Mexico are also slowly returning to "more normal levels."

Cross-border flows into Mexico have trended above 6 bcf/d on some days this week, Energy Aspects figures show, as cooling demand rose in response to warmer weather.

The U.S. car maker Ford had to shut down some manufacturing plants in the United States, due to supply chain issues with Mexican engines sourced from Chihuahua State, where industrial output is still limited due to Covid-related lockdowns. "The capacity cap in Chihuahua could mean that the issue is not unique to Ford," analysts said, warning these issues tend to greatly reduce electricity and gas demand from all energy-intensive industries.

GM, in contrast, is calling back hundreds of laid-off workers to its pickup factories. But some 200 workers at its Fort Bend, Indiana, assembly facility are out due to COVID-19, with workers also needed in Michigan and Texas.

## Trade flows to Mexico still below pre-Covid levels

Volumes on the Sur de Texas–Tuxpan (STT) gas pipeline are, however, below pre-pandemic levels, averaging 0.85 bcf/d this month so far. STT deliveries into SISTRANGAS via Monte Grande are hovering around 20 mmcf/d this month to date versus 0.2 bcf/d on average in April.

"Despite some reports confirming that the last leg of the Wahalajara pipeline system – Villa de Reyes–Aguascalientes–Guadalajara (VRAG) – is now operational, flow data indicate the pipeline has not yet begun flowing gas," Ms Fahy pointed out.

The first leg of the system – El Encino–La Laguna – has only delivered an average of 17 mmcf/d over 8-10 July to the Victoria thermal power plant.

"Contracting issues between pipeline developer Fermaca and CFE seem to be behind the delay of a full Wahalajara start-up," she said. "As such, we continue to expect Manzanillo sendout to be gradually substituted with VRAG volumes from the first quarter of 2021." ■

# National Grid's FES2020 strike 'confident tone' on Net Zero2050 targets

**Latest 'Future Energy Scenarios' (FES 2020), published by UK's National Grid, strike a more confident tone that sufficient fossil and green energy additions can be deployed to meet the Government's Net Zero by 2050 targets. At least two of four scenarios show pathways to accomplish this.**

Net emissions from the power sector could be negative by 2033 in all Net Zero scenarios, National Grid states. However, this requires at least 40 GW of zero-carbon capacity to be grid-connected over the next 10 years, while levels of natural gas burned unabated need to be halved by 2038.

More so than previous years, the FES 2020 gives details on the practicalities of achieving carbon reductions. A ramp-up in wind and solar deployment, large-scale hydrogen, build-out of carbon capture and underground storage (CCUS) as well as the digitalisation and transparent use of customer data is prevalent across scenarios.

## Hydrogen and renewable targets

Hydrogen is for the first time seen as a front-running technology for heating use, some transport sectors and electricity system flexibility. "While hydrogen forecasts may grab the headlines, the stretching targets for wind and solar deployment and a negative emissions power sector by the early 2030s are also notable components," commented Cornwall Insight's wholesale manager, James Brabben.

There is an important subtext in the document about the need to reform and evolve the markets themselves. The message is clear, saying markets must evolve to provide the right incentives.

## Re-design of wholesale power market

Analysts and various UK energy companies have for some time called for a re-design of the current wholesale market design to better support investments as more and more of the UK's future power plant fleet taken up by zero marginal cost generation, like wind and solar.

"If anything, this year's FES serves to re-emphasise the challenge between the need to build lots of low carbon infrastructure and the ability of current market design to provide the investment signals to make that happen," Brabben underlined.

Outside of the Contract for Difference (CfD) scheme, instated to support renewable energy build-out, this challenge is "yet to be adequately addressed," he said, "but [just that] needs to happen if we are to achieve these types of net zero compliant scenarios." ■

Gas to Power Journal

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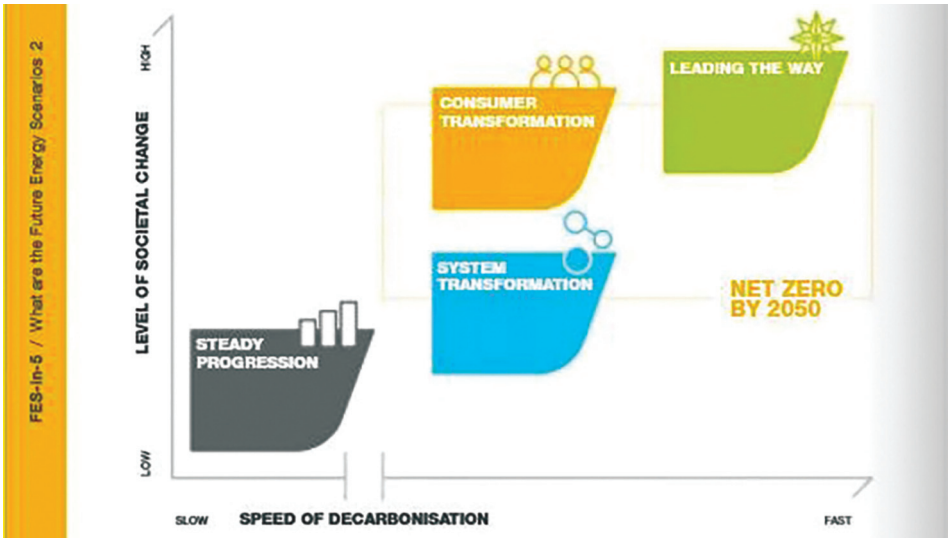


# Moixa secures $5.8m in 'bridge funding', plans to secure further $12.5m

**UK-based smart battery company Moixa has secured £4.6 million ($5.8m) in 'bridge funding' though a convertible loan, largely financed by Itochu Corp. Moixa said it aims to secure a further £10 million ($12.5m) by the end of the year as it wants to advance the rollout of its GridShare software in Japan.**

GridShare uses artificial intelligence (AI) to learn from consumers' behaviour and optimise daily charging, leveraging low carbon resources and time-of-day tariffs. Utilities hence can aggregate and manage large fleets of batteries, or electric vehicle chargers, to deliver flexibility services into ancillary markets.

"An intelligent green recovery from COVID-19 is essential to mitigate the impending impacts of climate breakdown," said Simon Daniel, CEO of Moixa told Gas to Power Journal. "AI technology gives us the edge we need as societies to accelerate the shift from fossil fuels, without placing unbearable costs on consumers.

## Itochu Corp leads investment

The $5.8 million in fresh funding came from Moxia's existing investors, led by Itochu Corp, a Japanese Fortune 500 company. The loan was agreed right after Moixa had doubled the number of batteries managed by its GridShare AI software in Japan to 20,000 in just six months.

Japan's government 10-year subsidy scheme for homeowners with rooftop solar is coming and end. GridShare AI algorithms help manage this change in regulation, optimising clean generation and storage on behalf of these small-scale, decentralized, residential power producers.


## Exponential growth for GridShare in Japan

Headquartered in London and Manchester, Moxia said it will use the funds to expand its footprint in Japan, the UK, mainland Europe and the US. Parts of the proceeds will also underpin the company's smart charging partnership with Honda, to be launched in the summer.

There are now more than 20,000 (200 MWh) Itochu batteries able to be managed by GridShare. "This growth is exponential," the Moixa CEO underlined. In December 2019, the company announced the fleet of batteries had reached 10,000 in just one year.

"The growth pace in Japan alone shows clear demand for smart, scalable solutions for the energy transition," Mr Daniel pointed out. "By automatically optimising our homes, electric car charging and energy systems to use the cleanest and cheapest power available, we can create a new energy economy that benefits everyone," he explained. Going forward, GridShare AI is meant to "orchestrate distributed energy assets and EV charging." ■

# MAN cuts jobs, ends steam turbine production in Hamburg

**MAN Energy Solutions is restructuring. Plans are to cut costs by 450 million Euros, partly through layoffs, with the aim of improving the OEM's cash position and liquidity, and achieve a 9% operating margin by 2023. Steam turbine production in Hamburg will come to an end, and MAN also considers closing its production in Berlin.**

Implementation of the cost cutting program will eliminate of up to 3,000 jobs in Germany and 950 abroad. MAN said it would reduce its workforce in a "socially responsible manner" but did not rule out making compulsory redundancies.

Some of MAN's key business areas, notably cruise ships, have been badly hit by the economic impact of the Covid-19 pandemic and management does not expect to see a recovery to pre-crisis levels until 2023. Speaking to shareholders, Dr. Uwe Lauber, CEO of MAN Energy Solutions said: "We need to prepare ourselves for a market environment that will remain difficult for a long period of time."


The restructuring plan is meant to address the current weaknesses, the CEO said and "make lasting improvements to MAN Energy Solutions' ability to respond to market fluctuations."

## Below target earnings

Dr Lauber underlined MAN had already "begun to combat" such negative market influences in recent years, and the introduced measures helped to meet revenue targets.

"In terms of earnings, however, we haven't yet reached our goal," he said; "Therefore, increasing our profitability and improving our competitive ability is key to continue successfully implementing our strategy for the future."

In 2018, MAN adopted a new strategy of transforming the company from a component supplier to provider of sustainable energy solutions. These new solutions are meant to account for 50% of its business by 2030. ■

# NEWS NUDGES

### NRG buys Centrica's North American arm for over $3.6bn

U.S. utility NRG Energy has agreed with Centrica to acquire the latter's North American subsidiary Direct Energy for $3.625 billion in an all-cash transaction. The transaction will diversify NRG's earnings by adding more than three million retail customers and generate an estimated $740 million in adjusted EBITDA upon closing.

### BlackRock puts $18bn into sustainable investment

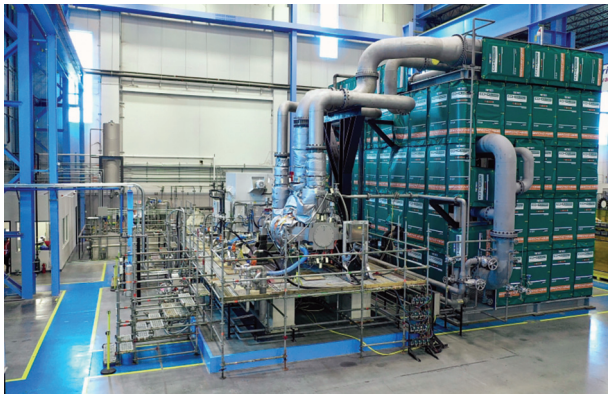
Sustainability aspects are poised to bring about "fundamental change" to the way financial market actors operate, said Philipp Hildebrand, vice head of U.S. investment company BlackRock. About 18 billion dollars have been put into BlackRock's sustainable investment products since the beginning of 2020, he told the German business daily FAZ, arguing this would be "only the beginning" of a much larger shift in investment practices. ■

# MHI opens new centrifugal compressor test stand in Houston

**MHI Compressor International (MCO-I) has launched a test stand for API617 centrifugal compressors in Houston. The investment turned MCO-I into the only compressor maker at the U.S. Gulf Coast which can carry out PTC 10 Type 2 performance tests as well as mechanical running tests.**

Customers of MCO-I are operators of small to mid-size compressors, typically used by the oil and gas, fertilizer and methanol industry as well as for decentralized power generation.

The first test stand demonstration test was successfully completed in June. Now, the successive tests are run in a closed-loop-system, with a double-ended motor drive. The test center also features multiple gearboxes and auxiliary equipment to test all small-to-medium sized horizontally-split and barrel compressors.



## Shorter time-to-market

As the only OEM capable to perform PTC 10 Type 2 testing in the U.S. Gulf Coast region, MCO-I will be able to manufacture, assemble and test exclusively within the United States. The localised offering shortens lead times for projects in the U.S. due to a quicker time-to-market.

The proximity of MCO-I's test center to existing plants allows the company to offer performance testing and mechanical runs of compressors that have been revamped or significantly modified, all within a tight customer turnaround schedule.

Schedule risks can be minimised thanks to simplified logistics, both for transporting the machinery to site as well as for installation and commissioning.

## Shop tests 'close to home'

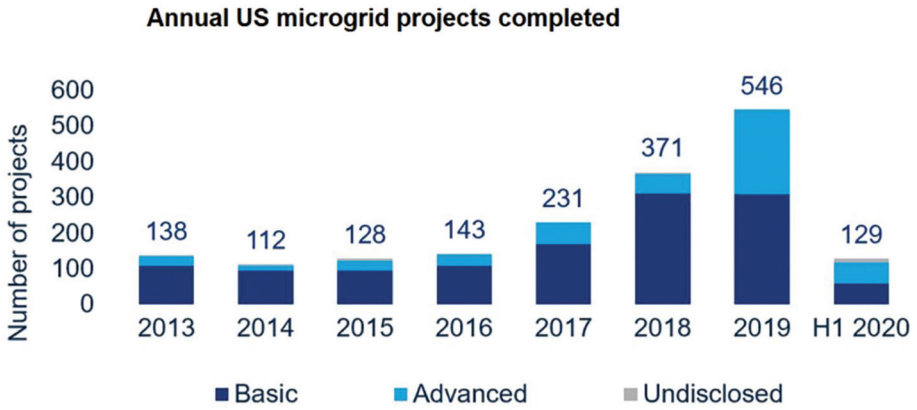
Technically-interested customers can now witness shop tests close to home and get a first-hand and more comprehensive explanation of shop test results, right at the Houston test center.

"Our new Gulf Coast test stand means MCO-I can now execute as a full service factory that can manufacture, assemble and test centrifugal compressors for our Gulf Coast customers. More than 90% of our customers are located within a 300 mile radius of the facility," said Clayton Jurica, sales manager, MCO-I.

Mitsubishi Heavy Industries Compressor Corporation (MCO), established in the U.S. in 2012, is one of the world's largest manufacturers of process compressors and mechanical drive steam turbines. It holds a 70% stake with Mitsubishi Corporation (Americas) as a 30% joint venture partner. ■

# Record number of microgrids installed in U.S., handled by 3 main players

**Three main players – PowerSecure, Enchanted Rock and The American Red Cross – have installed over two-thirds of all microgrids added in the United States over the past 10 months. A total of 546 microgrids were installed in 2019 alone, more than in any previous year.**




Though the systems installed by PowerSecure and Enchanted Rock were almost all basic, Red Cross' systems rely on Blue Planet Energy's energy storage solution. These are some of the first mass deployments of solar-plus-storage at non-residential locations that are designed to power schools for more than 24 hours.

## Slow start into 2020

While last year saw a record number of microgrids systems installed, annual capacity was down 7% from 2018. However, the first half of 2020 was the slowest start to the year for the microgrid market since 2016.

"Our outlook for the next two years has been decreased primarily due to project delays. Starting in the second half of 2022, we expect to see the challenges of originating new deals during 2020 impacting capacity additions through 2024," said Maze-Rothstein.

## Most systems below 5 MW

In terms of technology, most of the systems installed last year were below 5 MW. According to Wood Mackenzie, this is part of a larger trend. "The market has shifted from being led by projects above 5 MW pre-2017 to smaller systems starting in 2017. Technology-neutral microgrid developers are taking notice and developing more modular designs," said Isaac Maze-Rothstein, Wood Mackenzie Research Analyst and report author.

Distributed fossil fuel generation accounted for 86% of installed microgrid capacity in 2019, according to the Wood Mackenzie report. "Although most of the power distributed via microgrids came from fossil fuel generation last year, we believe that microgrids in the US will become increasingly reliant on renewables technologies. Through our five-year forecast we are optimistic that solar, wind, hydropower and energy storage will grow to account for 35% of annually installed capacity by 2025," added Maze-Rothstein.

Despite 2019 capacity beating Wood Mackenzie's forecast expectations, the outlook through 2025 is more conservative due to coronavirus impacts. ■

# Tesla will also make battery cells at its new Berlin factory, CEO Musk says

**U.S. electric car manufacturer Tesla will be producing battery cells for energy storage along with electric vehicles at its planned German factory in Grünheide near Berlin. "There will be local cell production that meets the needs of the Berlin factory," Tesla CEO Elon Musk told investors during a virtual conference.**

Tesla plans to manufacture some 500,000 cars at the factory located in the state of Brandenburg, starting in mid-2021.

Though there was no official mention of battery cell production in the building application filed by Tesla in January, an environmental impact assessment included a floor plan with an area labelled "Cell," meaning battery production will take place there.

*Render of Tesla's Gigafactory at Grünheide near Berlin*

## Berlin hands out e-car premiums

Electric vehicles enjoy growing demand in Germany, supported by generous subsidies for first-time buyers as Angela Merkel's coalition government is pushing for a green recovery to overcome the impact of the coronavirus.

To revive Europe's largest economy from the Covid-19 impact, the German government coalition has agreed a 130 billion Euro stimulus package. Measures includes VAT reductions, lower levies on power prices for households and small businesses as well as a 50 billion Euro 'future package' for investments e-mobility and hydrogen technologies.

The coalition resisted industry calls for a buyers' premium for all types of cars, and instead opted to double subsidies for electric cars only. E-car buyer premiums were doubled from 3,000 to 6,000 Euros in an effort to increase the number of e-cars on the road.

German carmakers have started to shift focus on e-mobility, sparking a rise in demand for e-fuelling stations. Analysts note however, the shift to low-carbon mobility in Germany has been "slow" but by now country's key carmakers – BMW, Daimler and VW – all betting on electric vehicles. ■

# GE helps decarbonise Uniper's gas power plants in Netherlands and UK

**Uniper, Europe's largest electric utility based on sales, is decarbonising its gas-fired power plants in the Netherlands and the UK with the help of GE technology. The two partners agreed to focus on converting power units to hydrogen co-firing, and will set out a detailed decarbonisation roadmap by early 2021.**

Uniper's base of installed gas turbines across Europe totals over 4 GW, providing ample opportunity for a "holistic decarbonisation assessment across many GE technologies."

Headquartered in Düsseldorf, Germany, Uniper has been one of the first European utilities to adopt GE technologies, notably for its power stations at Grain, Connah's Quay or Enfield in the UK. Moreover, GE technologies are also deployed at Uniper's gas storage facilities in Germany, Etzel and Epe.

## Focus on hydrogen co-firing

Uniper's new strategy aims for climate-neutrality in its European generation business by 2035. The utility already produces around 24 terawatt hours (TWh) of CO2-free electricity with its hydroelectric and nuclear power plants in Germany and Sweden.

Andreas Schierenbeck, CEO of Uniper called the agreement with GE proof for the company's commitment to decarbonisation. "In a few years, Uniper's European fleet will consist mainly of climate-friendly gas-fired power plants and CO2-free hydropower.

"From now on, our investments will focus primarily on the further decarbonisation of the gas assets which could include post combustion carbon capture, utilization and sequestration (CCUS) as well as blue or green hydrogen," he said.

## Expanding gas and H2 storage capacity

Clean hydrogen (H2), produced through electrolysis from excess wind and solar energy, is meant to gradually replace the fossil components of the gas plants.

"If we also succeed in using our gas storage facilities to a large extent for hydrogen, we will be closer to a solution to the core problem of the European energy transformation: the lack of storage capacity for fluctuating renewable energies on an industrial scale," the Uniper CEO pointed out.

GE CEO Scott Strazik expressed his appreciation to work with Uniper on the decarbonisation of its gas asset base, and provide lower-carbon electricity for Uniper's customers across Europe.

"We look forward to utilizing our 80+ years of gas turbine development experience – including six million operating hours with low-BTU fuels," he said, "to make Uniper's decarbonisation vision a reality." ■


*Uniper's power gen assets in western Europe*

# Cummins installs QSV91G gas genset at Agnew Gold Mine in Australia

**Gold Fields, operator of Agnew Gold Mine in Western Australia, has contracted Cummins to install QSV91G generators as part of Australia's largest hybrid renewable energy microgrid. The system consists of a 23 MW off-grid power station, plus 18 MW wind power, and a 13 MW battery.**

To set up the microgrid at the Agnew Gold Mine, operated by Gold Fields for some 30 years, Cummins will be working together with the distributed energy producer EDL. The Cummins gas gensets will mostly drive the 23MW off-grid power station, while diesel can be used as a backup fuel. QSV91G generators can provide backup power at temperatures of up to 45°C, Cummins pointed out.

During the first 12 months of operation, the installed and dispatchable capacity at the Agnew microgrid will come to just over 56MW - enough to powering 11,500 homes, though all the energy produced will be used by the gold mine.

*Bird's eye view of Gold Field's microgrid at the Agnew Mine*

## Stable operations at 45°C

To be able to keep running at temperatures up to 45°C, the Gold Fields chose to use nine Cummins QSV91G gas generators which can operate in high ambient conditions. The gas gensets can also provide high impact step loads and fast ramp rates while maintaining power quality.

In addition to the QSV91G gas gensets, Cummins also installed two QSK60 diesel generators that can provide the Agnew Gold Mine with additional power at times of peak demand. The diesel genset also have the ability to black start the entire power station in the event of an outage.

To balance electricity demand from the mine with the output of the power plant, a Cummins digital master control (DMC8000) was also installed.

## Aspiring for 50% green energy

At the Agnew Gold Mine, one of nine mines operated by Gold Fields, the Australian company had for long been seeking to create an innovative hybrid renewable energy solution. The Agnew mine is in operation for over 30 years, producing approximately 220,000 oz of gold per annum.

To ensure this project was a success, Cummins collaborated with global distributed energy producer EDL, which was selected due to its track record in providing sustainable, reliable energy solutions for remote operations and communities.

David Eccleston, Technical Sales Support Lead, Cummins Power Generation, said: "We're pleased to be working with EDL to deliver this landmark project, which will provide the Agnew Gold Mine with more than 50% renewable energy over the long term, without compromising power quality or reliability." ■

# Rolls-Royce to deliver first hybrid-ready MTU PowerPacks to Irish Rail

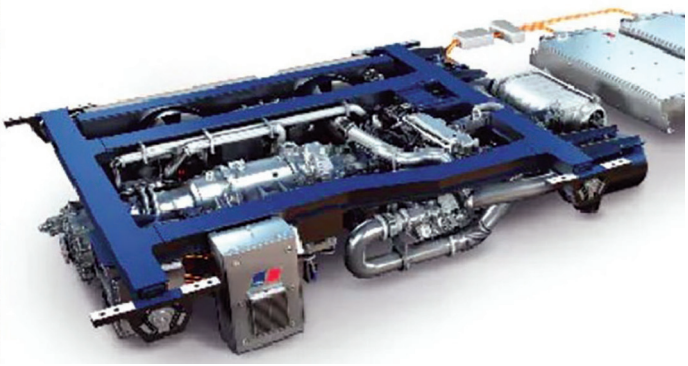
**Rolls-Royce is to supply its very first series production MTU PowerPacks to the Irish national rail operator Iarnród Éireann, which ordered 41 units. Fitted with MTU 6H 1800 R86 engines, the PowerPacks each deliver 375 kW from the diesel engine as well as 150 kW from the electrical machine.**

The order currently includes refurbishing the fleet with new transmissions and testing both conventional EU Stage V and hybrid traction systems from 2021. Irish Rail said it also plans to introduce into service further MTU Hybrid PowerPacks in the years to come.

## In-service date in 'late 2022'

Delivery is to commence in early 2021, and the PowerPacks are to power Class 22000 trains on scheduled services from late 2022. Rolls-Royce specified that it could equip these PowerPacks with batteries at a later stage, turning them into fully-fledged MTU Hybrid PowerPacks.

"The MTU traction systems we are now supplying set new standards for cleanliness, reliability and fuel economy," Jürgen Blassmann, Head of Rail Business at Rolls-Royce business unit Power Systems pointed out. Following conversion to MTU Hybrid PowerPacks, Iarnród Éireann Irish Rail will use these drive systems to make fuel savings of over 30%, depending on the route, also reducing CO2 emissions by the same amount. ■



# JERA fast-tracks work on LNG-to-Power project (718 MW) near Dhaka

**JERA, Japan's largest LNG importer and electric utility, and Reliance of India are fast-tracking construction works on a LNG-to-Power project near Dhaka, Bangladesh. The 718 MW combined-cycle power plant is contractually bound to be commissioned by August 31, 2022.**

Reliance in September 2019 sold a 49% stake in the project to JERA which no strives to accelerate construction with a view to delivering LNG to the power plant from its own portfolio.

JERA, a joint venture between Tokyo Electric Power and Chubu Electric Power Co, is not only Japan's largest power producer but also has access to a global LNG supply portfolio through various long-term oil-indexed procurement deals.

Once fully operational, the Meghnaghat CCGT will use an estimated 110 million cubic feet per day (mmcf/d) of regasified LNG. Equipped with two dual-fuel gas turbine, capable to both operated on liquid fuel and natural gas, the Meghnaghat power plant will have an installed capacity of 337 MW (gas), 315 MW high speed diesel (HSD) fuel.


## JERA, Petrobangla to handle LNG supplies

LNG imports to fuel the power plant will be handled by JERA, although the actual gas supply agreement for the 718 MW Meghnaghat CCGT has been signed with Titas Gas Transmission & Distribution Company, a local TSO in Bangladesh. In preparation for further LNG-fuelled power projects in the country, Bangladesh's state-run Petrobangla already increased the country's import capacity to 1.0 billion cubic feet per day (bcf/d) by chartering two additional floating storage and regas units (FSRUs).

Once operational by August 2022, the LNG-fuelled power plant at Meghnaghat will help meet the region's fast growing energy demand. Household energy use typically peaks during the summer season, when demand for air conditioning is at its highest.

Demand industry and manufacturing is also on the rise even though the Bangladeshi government is considering re-imposing partial lockdowns to quell a second wave of the Covid-19 pandemic.

## Electricity sold under 22-year PPA

All electricity produced at the Dhaka LNG-to-Power plant will be purchased by the Bangladesh Power Development Board (BPDB) under a 22-year power purchase agreement (PPA) at a levelised tariff rate of 7.312 US cents per kilowatt-hour (kWh), assuming a 82% load factor.

Project finance comes partially from Japan, were JERA helped to arrange a $644 million loan from public and private lenders, including Japan Bank for International Co-operation, the Asian Development Bank (ADB), Mizuho Bank, Sumitomo Mitsui Banking Corp and MUFG Bank.

In addition to the Dhaka LNG-to-Power project, Reliance also plans to develop 3,000-MW gas-fired power plant and an adjacent LNG terminal with 500-mmcfd capacity in Bangladesh. ■

# GE upgrades gas turbine at ADNOC's onsite power plant in Ruwais

**GE Gas Power has installed its MXL2 upgrade on a gas turbine at ADNOC Ruwais General Utilities Plant in the United Arab Emirates (UAE). Despite Covid-19-related challenges, the upgrade was completed within six months, resulting in a 10.7 MW increase in turbine output, using the same amount of fuel.**

The Ruwais General Utilities Plant has an installed base of four GE 13E2 units that can generate up to 650 MW of electricity, all used for the refinery's production process.

Planning and executing such an upgrade typically takes up to 18 months, but GE's team of engineers managed to complete the project within just six months. "At GE, we are committed to supporting our customers' power through every challenge and we're honored to collaborate with ADNOC Refining on this project," said Joseph Anis, President & CEO of GE Gas Power in the Middle East, North Africa and South Asia.

Ruwais Refinery, managed by ADNOC's refining arm Takeer, is the largest oil refinery in the UAE with a capacity of 400,000 barrels per day (bpd) – more than twice the size of ADNOC's Jebel Ali refinery. The refinery supplies a diversified range of petroleum products – LPG, naphtha, gasoline, jet fuel, gas oil and base oils, fuel oil, petrochemical feedstock and propylene – to its customers that are mostly based in Asia.

## XL2 upgrade raises GT efficiency by 1.5 percent

Energy-intensive industries, such as refining, need to ensure a stable supply of competitively priced electricity. Hence, refining companies often choose to build onsite power stations to ensure continuous operation of the refinery's fracking towers. The GE chief executive singled out upgrade solutions as "an effective and affordable means" to increase power output and lower emissions per megawatt generated.

The MXL2 upgrade enhances allows operators of GT13E2 gas turbines to achieve up to a 1.5 percent increase in combined cycle efficiency and extend inspection intervals up to 48,000 equivalent operating hours (EOH). The upgrade combines GE's latest technology developments, and over 10 million operating hours of GT13E2 fleet experience.

*Ruwais refinery complex in the UAE*

The retrofit and upgrade of ADNOC's General Utilities Plant at Ruwais comes after similar upgrades were carried out in recent years on two other gas turbines at the same plant. ■

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