



Low TTF balance-of-summer prices may herald US LNG shut-ins

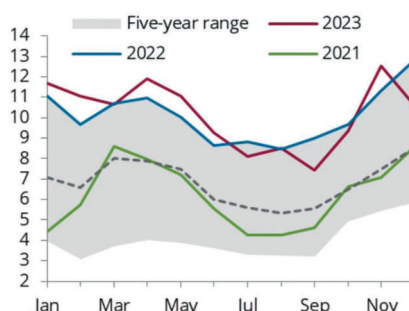
Energy Aspects anticipates balance-of-summer prices at Europe's benchmark TTF gas trading hub as low as €23.20/MW amid downward revisions of projected gas-burn for power generation and weak industrial demand. China's demand response to low prices will be key for avoiding US LNG shut-ins, analysts said, pointing at accelerating spot tenders by second-tier buyers.

It is not inevitable, however, that the extra demand from China will result in Europe staying clear of the €8.20–11.80/MWh, or \$2.60–3.80/MMBtu, shut-in price window for US LNG exports, analysts reckon. Short-term demand response to low gas prices in Europe is deemed unlikely, so balancing the loose market will require "some supply turndowns and additional stock carryover," analysts reckon.

Sluggish response to low prices

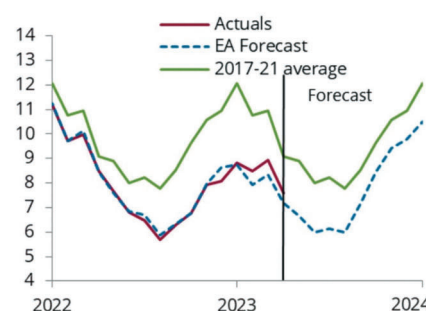
Gas-burn in the European power sector is forecast to fall by 0.1 bcm per month in the June to December period as strong utility-scale renewable generation minimises the need for thermal power. Though analysts observed a downturn in lignite generation

European LNG imports, bcm



Source: Refinitiv, Vortexa, System operators, Energy Aspects

Western European industrial demand, bcm



Source: ENTSOG, System operators, Energy Aspects

to 7 GW in May, versus 10.8 GW in January, there has been little lignite-to-gas switch due to the low load and high non-thermal power contribution.

The low load on the grid is caused by sluggish electricity demand from industry as Eurozone manufacturing is contracting further and factory managers are pondering to permanently offshore some power-intensive industrial processes.

"It may be that factory managers have kept their facilities offline even with lower gas prices as they make their decisions on permanently shutting," analysts commented. An alternative explanation

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Eastern German lignite power plants needed again next winter

Several lignite power units, brought back from reserve during the energy crisis, will again be needed to stabilise electricity supply in Germany in the coming winter. In view of tight gas supplies and difficulties to install LNG import terminals on the island of Rügen, economy minister Robert Habeck expects utilities will again fire up eastern German lignite units.

The government had temporarily permitted that mothballed lignite power units to re-enter the market and generate electricity in an effort to avert a power crunch when Russia's Gazprom cut short contractual gas deliveries in retaliation for Western sanctions. The rule of bringing back plants from reserve will expire by the end of June, but the ministry is considering extending it.

The energy crisis has been throwing a life line to lignite-fired power units but analysts stay convinced that Germany will accelerate its coal exit as the majority of ageing coal power units will no longer be profitable after 2030.

The ruling coalition of Social Democrats, the Liberals and the Green Party had agreed to advance the country's agreed coal exit date to 2030



LEAG's lignite-fired plant Jänschwalde was re-instated during the gas crisis

from the current target of 2038. Eastern German states adamantly oppose the plan even though the government provided €40 billion in structural support payments to ensure a "just transition" in regions whose economy hinges on coal.

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for the unexpected lower gas demand would be a "much higher level of efficiency gains," albeit unlikely, or a slower pass-through of lower wholesale gas prices into industrial tariffs which would mean many factories still have to pay high second quarter 2022 prices.

Analysts hence upscaled the amount of permanent, no longer price-responsive demand destruction they expect to take place over the balance of 2023. "We have 2% of the 2017–21 average demand permanently lost over the first half of this year, 4% over the third quarter, 6% over the fourth quarter of 2023 and 8% thereafter," they disclosed.

Supply downturns and floating storage

With TTF balance-of-summer prices at €23.20/MWh, which is €2.40/MWh below the prevailing CME curve, Energy Aspects already forecasts TTF pricing at the bottom of the coal-to-gas fuel-switch range – but there is still little sign of an imminent demand uptick from industry. "As such, tightening Europe's balance in order to avoid surpassing European storage capacity before end-October will have to come from supply turn-downs," analysts noted.

Another open to handle Europe's ample supply – given the scale of contango in TTF prices – would be to carry over more gas in-

ventory into 2024. Large-scale use of Ukrainian gas storage is unlikely given the ongoing conflict, so most additional inventories will be held in the form of floating LNG storage, with September-loaded cargoes being unloaded in December–January.

Analysts had observed a build-up of around 2.5–3.0 million tons of floating storage by early October last year, with the subsequent unloading of those LNG cargoes pushing down European gas prices and preserving gas storage into next year. "There was an excess of global exports to global imports in late 2022 which we have replicated for this year," they concluded. ■

High US renewable and gas generation reduce summer coal demand

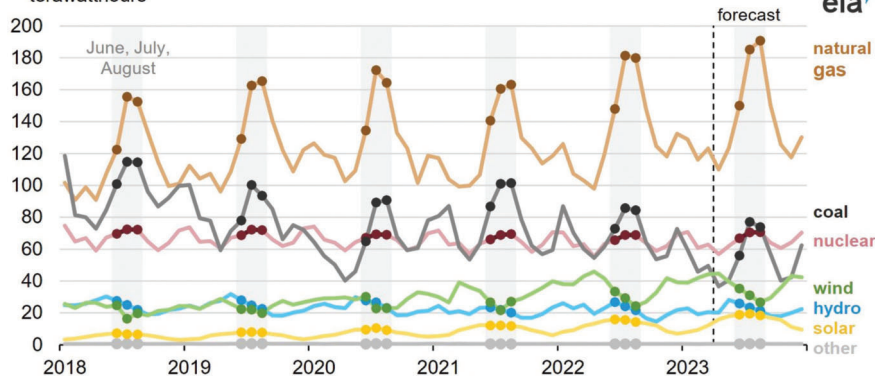
Rising additions of new solar, wind and gas-fired power plants in the United States will lower coal demand this summer. Gas – the primary US power source – is forecast to grow by 3%, or 16.7 TWh amid favourable fuel costs, helping to balance renewables build-out which contributes to 15%, or 36 TWh retired coal capacity.

Increases in installed gas, solar and wind power capacity are anticipated to offset the reduced output from coal-fired power plants. Apart from the 16.7 TWh of new gas generation, there have been estimated 14.5 GW of solar power additions and about 8 GW of new wind power capacity during the past twelve months ending May 31, according to government analyst's June Short-Term Energy Outlook (STEO).

Solar PV paired with batteries

Much of the solar-powered growth occurs in Texas and California and analysts expect new capacity will lead to a 24%, or 10.8 TWh, increase in solar generation this summer compared with last summer.

U.S. monthly electric power sector generation by energy source (2018–2023)
terawatt-hours



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023

Many solar PV projects are paired with associated battery storage to help provide electricity when the sun does not shine. Developers added some 5.3 GW of battery capacity over the past twelve months, a staggering 90% rise.

Wind power strong in springtime

Wind power is an important component of some US regions during the spring months. On March 29, the Southwest Power Pool (SPP), which covers parts of Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, and neighbouring states, and the Electric Reliability Council of Texas (ERCOT) both reported new wind penetration records.

SPP reported wind penetration of 88.5% on March 29, and ERCOT reported wind penetration of 67.2% for the same day.

For this summer, US government analysts forecast that U.S. wind-powered generation will be 7%, or 5.8 TWh, higher than last summer, contributing to dwindling economics for coal-fired power.

Opening of a new reactor at the Vogtle nuclear power plant is also scheduled for this summer, adding some 4.5 TWh of nuclear baseload power. But analysts pointed out that overall nuclear generation continues to decline as since the end of 2017, six nuclear units with a total capacity of 4,736 MW retired. ■

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Power plant operators like RWE and LEAG also received compensation amounting to €4.35 billion in return for shutting down operations of lignite-fired units. Plant

closures are scheduled to occur according to a fixed timetable that can only be altered by the regulator BNetzA to preserve grid stability. ■

Gas to Power Journal

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Earthquake makes Japan's Hokkaido Electric shut 600 MW power unit

A magnitude 6.2 earthquake off Japan's northern island Hokkaido has made the local utility halt a 600 MW coal-fired power unit on Sunday, though it stressed no abnormalities were detected at its Tomari nuclear power plant. The unexpected outage deteriorates Tokyo's tight summer electricity balance with reserve margins for July at just 3.1% – just above the minimum requirement.

Hokkaido Electric had to take Unit 2 at its Tomato-atsuma power plant offline just after 6:15 pm local time on Sunday evening, aiming for a timely restart of operations. The shut-down severely squeezes the electricity supply balance right at the onset of summer.

Reserve margins need to be above a minimum of 3% to ensure stable power supply in the greater Tokyo area in the peak summer season. Keen to avert a power crunch, the regulator on June 9 urged industries and households to save electricity on a voluntary basis during July and August.

Utilities may resort to gas peaking plants

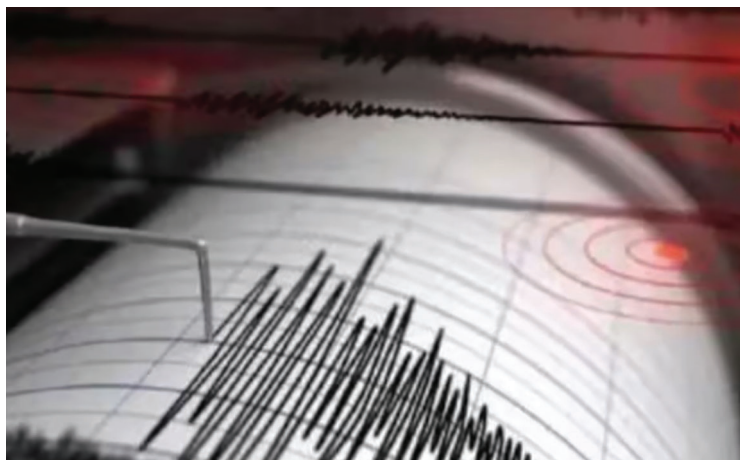
For August, the reserve margin for greater Tokyo is estimated at 4.8%, rising towards 5.3% in September which is still significantly below the recommended reserve power supply capacity ratio of 10% for western Japan. Utilities may well have to fire up gas

peaking plants at times of peak summer demand.

Spot LNG purchases could rebound in this context while recent Vortexa shipping shows that cargo deliveries fell to more than a decade-low of around 4 Mt in May, coinciding with a 4.9 GW year-on-year rise in nuclear availability and a 3.1 GW reduction in the country's overall electricity demand.

No long-term LNG contracts are on offer before 2026 – they have all been sold out, Japanese gas importers told the trade ministry in a recent survey. "The LNG procurement environment has changed completely, as Asian and European buyers are

now in huge competition", they said just after Sinopec managed to strike a 27-deal with QatarEnergy for 4 mtpa of LNG offtake from its North Field East expansion project. A lack of investment into liquefaction and export projects, Europe's rush to replace most of Russian pipeline gas deliveries with LNG, has been heating up the global competition for cargoes. ■



South Korea aims to increase nuclear power though LNG prices fall

Plans by the Korean government to increase nuclear power generation to nearly 35% of the energy mix will curtail the country's LNG demand. Deterred by volatile gas prices, the government wants gas-burn to decline 22.9% by 2030 though analysts say rising global supplies and falling spot LNG prices would support rising imports over the next three years.

In its 10th Basic Plan for Long-term Electric Supply and Demand (BPLE), the government boosted nuclear targets and scaled down plans for a renewables build out as nation wants to reduce its dependence on imported fossil fuels while meeting emission reduction targets.

Nuclear is meant to constitute over a third of installed generation capacity by the

end of the decade, up from 24% forecast in earlier proposals, while the contribution of renewables is falling to 21.6%, down from 30.2% targeted earlier.

The government supports nuclear as a baseload power source, with comparatively low operating costs, in the face of volatile LNG prices. The new 1.4 GW Shin Hanul 2 reactor is officially scheduled to come online

envisages ambitious cuts in the contribution of LNG-fuelled power generation which is intended to fall to 22.9% by 2030 and further to 9.3% by 2036. Korea has to import its entire gas needs as LNG with 55% used by the power sector, while 16% goes to industry as a chemical feedstock or a source of industrial heat.

Analysts warn the government's pivot to nuclear may prove difficult to implement as utilities have signed long-term LNG contracts and want to use their gas-fired power plants for their entire life-cycle to maximise return-on-investment on these assets.

But the policy is showing first effects as outright LNG consumption from the power sector on course to fall by 0.6 million tons, equivalent of 0.9 GW, in the second half of this year to 10.4 Mt – largely due to higher nuclear power output and a 0.6 GW rise in renewable generation. These days, power sector demand for spot LNG is just half of what it was over the past few years – despite falling prices. ■



The Hanul nuclear power plant is being extended

in September 2023, but analysts assume it will start up in mid-January 2024 as it has not yet secured an operating permit.

Ambitions to curtail LNG-fuelled power

The government's revised energy mix also

Clean energy spending could rise to \$1.7 trillion, outpacing fossil fuel capex

Global spending in clean energy technology is outpacing capital investment on fossil fuels as affordability and security of supply concerns strengthen momentum behind sustainable options, the International Energy Agency (IEA) finds. Of the \$2.8 trillion set to be spent on energy this year, over \$1.7 trillion goes to clean technologies, leaving slightly over \$1 trillion for coal, gas and oil.

Anual clean energy investment is expected to rise by 24% between 2021 and 2023 – driven by renewables and electric vehicles – compared with a 15% rise in spending on fossil fuel over the same period. Other clean energy technology, evaluated in the IEA's latest World Energy Investment report, includes nuclear power, grids, energy storage and low-emissions fuels.

Low emission tech dominates power gen investment

Investment trends indicate that clean technologies are pulling away from fossil fuels, said IEA executive director Fatih Birol. "For every dollar invested in fossil fuels, about 1.7 dollars are now going into clean energy. Five years ago, this ratio was one-to-one," he said, pointing out:

"One shining example is investment in solar, which is set to overtake the amount of investment going into oil production for the first time." Led by solar, low-emissions electricity technologies are expected to account for almost 90% of investment in power generation.

Electrified end-use items are high in demand by consumers, with heat pump sales having seen double-digit annual growth since 2021 while electric vehicle sales set to leap by a third year in a row.

Financing of over 90% of the additional Capex in clean energy technologies will come from the world's advanced economies

and China which could open up new dividing lines in global energy supply if the transition to cleaner sources does not pick up elsewhere.

Middle Eastern producers still invest in oil and gas

Spending on upstream oil and gas is forecast to rise by 7% in 2023, taking it back to 2019 levels. "The few oil companies that are investing more than before the Covid-19 pandemic are mostly large national oil companies in the Middle East," the IEA pointed out.

Though many fossil fuel producers reaped record profits last year due to sky-high fuel prices, the majority of this cash flow has gone to dividends, share buybacks and debt repayment – rather than back into traditional supply.

Nonetheless, the rebound in fossil fuel investment could see it rise in 2023 to more than double the levels needed in 2030 in the IEA's Net Zero Emissions by 2050 Scenario. Coal investment, in particular, is on course to reach nearly six times the levels envisaged in 2030 in the Net Zero Scenario.

Analysts criticise that the oil & gas industry's capex on low-emissions alternatives such as clean electricity, clean fuels and carbon capture technologies was less than 5% of its upstream spending in 2022 – though the share is higher for some of the larger European companies.

Emerging and developing economies fall

short on investing in clean energy due as high interest rates increase the cost of capital and put a further burden on financially strained utilities. Weak grid infrastructure makes it difficult to accommodate a rising share of intermittent electricity from wind and solar power sources, while investors hesitate to install energy storage and electrolyzers amid unclear policy frameworks and a lack of supportive market designs. ■

NEWS NUDGES

Siemens Energy, DNV create 3D printing platform

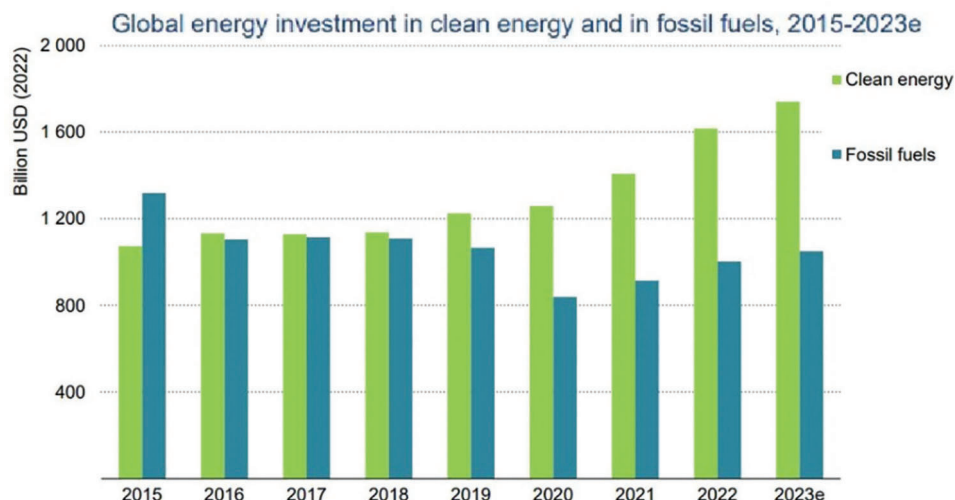
Siemens Energy and the classification society DNV have teamed up to create a new industrial 3D printing quality assurance platform. The solution combines Siemens's AM Cockpit for metal additive manufacturing and DNV's Independent Quality Monitor (IQM) customer portal with a view to speeding up the roll-out and adoption of 3D printed parts.

ACWA inaugurates Al-Dur 2

Saudi developer ACWA Power has commissioned the Al-Dur 2 Phase 2 Independent Water and Power Project (IWPP) in Bahrain, built at a cost of over \$1 billion. The IWPP processes 50 million gallons of desalinated water daily and generates 1,500 MW of electricity, which increases the Kingdom's overall production capacity to 5,044 MW.

Mountain Valley Pipeline proceeds

Legislation to raise the US debt limit and expedite permit approvals has made Equitrans Midstream, the operator of the Mountain Valley Pipeline, reinstate its intention to complete construction of the project by the end of this year at an estimated total cost of \$6.6 billion. Spanning approximately 303 miles across West Virginia and Virginia, the pipeline will supply natural gas to local distributors, industry and power generators in the US mid-Atlantic and southeast regions.



Note: 2023e = estimated values for 2023.

IEA. CC BY 4.0.

JERA modifies gas turbine at Linden Unit 6 to co-fire refinery off-gas

Modification of the gas turbine at Unit 6 of the 972 MW Linden Power Station has been completed by JERA Americas, enabling the co-firing of natural gas with hydrogen-containing off-gas from the adjacent Bayway oil refinery owned by Phillips 66. Due to a lack of affordable hydrogen in Japan, JERA is accumulating technical expertise at projects abroad.

As Japan's leading LNG importer and power generator, JERA aims to convert its entire gas-fired power generation fleet to co-fire cleaner-burning hydrogen. But this would require the procurement of hydrogen at an "economically rational price" and the development of carrier technology, so it will likely take some time before hydrogen can be used at scale to generate electricity in Japan.

In the meantime, JERA is advancing co-firing projects in regions where hydrogen is already available with a view to applying the expertise gathered to future projects both at home and abroad. For the Linden Unit 6 open-cycle gas turbine, the hydrogen-containing hydrogen is sourced from a nearby refinery.

Combusting up to 40% hydrogen

Linden Cogen is a gas-fuelled cogeneration plant situated in Linden, New Jersey, that produces power and steam for nearby in-



Linden gas power station

dustrial as well as electricity for the New York Independent System Operator and PJM market areas. The overall power complex has six gas turbines and three steam turbines and is owned by JERA Americas (50%), EGCO (28%), DBJ (12%), GS-Platform Partners (10%).

Unit 1-5 are combined-cycle gas plants, commissioned in 1992, while Unit 6 was built in 2002 as an open-cycle gas plant that has now been converted to hydrogen co-firing. The modified Unit 6 at Linden is now capable of mixed combustion with up to 40% hydrogen, reducing CO2 emissions by approximately 10% of annually.

Namibia sets up \$10bn hydrogen project

Hyphen Hydrogen Energy, a joint venture of South Africa's Enertrag and Nicolas Holdings, has launched a \$10 billion-dollar project to build wind and solar PV plants with a combined capacity of 7 GW to produce green hydrogen and ammonia. German investors participate in the project which is designed to produce 2 million tons of green ammonia at full scale.

"The total capital investment of 10 billion dollars is roughly equivalent to Namibia's annual GDP," Hyphen said, adding the project will create up to 15,000 new jobs during the construction phase, and 3,000 permanent jobs during its operation.

The investment was made through the EU's Global Gateway initiative with a view to making Namibia energy-independent and produce large quantities of the hydrogen-derivative ammonia for export, which can be shipped more easily than hydrogen.



Render of Hyphen's H2 project in Namibia

Oman could become competitive clean hydrogen supplier by 2030

High-quality renewables and vast tracts of available land could turn Oman into a leading supplier of cost-competitive hydrogen by 2030, the International Energy Agency (IEA) says. The emirate aims to produce 1 million tons of clean hydrogen a year by 2030 and up to 3.75 mt by 2040 which would be 80% of its current LNG exports in energy-equivalent terms.

The emirate has extensive expertise in handling and exporting both LNG and ammonia that is directly applicable to renewable hydrogen and hydrogen-based fuels. By 2040, Oman aims to export up to 8.5 mt of clean hydrogen – almost double the energy equivalent of its current LNG exports. If realised, the transition

would make both Oman's public finances and its domestic power mix far less reliant on hydrocarbons.

Solar PV competitive with gas-fired power

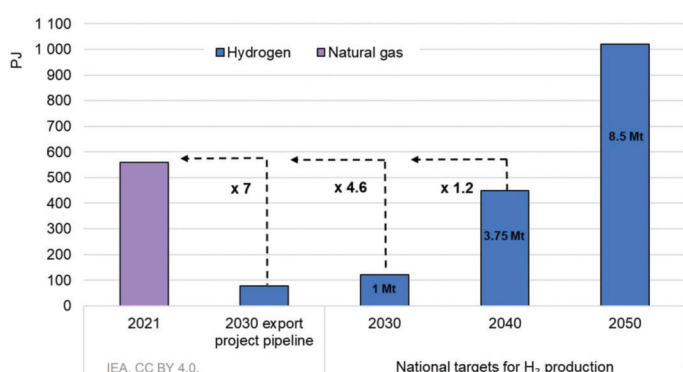
Today, oil and gas account for around 60% of Oman's export income and fuel over 90%

aside for development by 2030 and six projects have been allocated land for renewable hydrogen in the country's first such auction process.

Based on recently awarded bid prices, utility solar PV and wind are likely already competitive with electricity generation from natural gas in Oman. IEA modelling shows Oman can cost-effectively achieve its targets of renewables reaching 20% of the country's electricity mix by 2030 – and 39% by 2040.

Scaling up clean H2 production to 1 million tons by 2030 would require investment of around \$33 billion, while an additional \$4 billion would be needed to boost renewables' share in the country's energy mix to 20%, analysts find. If enacted, Oman could lower its domestic gas-burn for power generation by 3 billion cubic metres a year.

Size of Oman's LNG exports in 2021 vs. renewable hydrogen export project pipeline and renewable hydrogen targets (2030, 2040, 2050)



of the country's electricity generators. But the emirate is determined to reach Net Zero emissions by 2050 and has started reducing fossil fuel use in its domestic energy mix. So far, 1 500 square kilometres of land have been put

H2-Industries' pyrolysis tech transforms flaring gas into clean hydrogen

Flaring associated gas from oil wells wastes some 144 Bcm of gas each year – enough to power all of sub-Saharan Africa. H2-Industries' pyrolysis technology converts emissions into a valuable resource by producing up to 100kg of hydrogen and 730kg of solid carbon from one tonne of flaring gas.

The World Bank dismisses flaring as a monumental waste of a natural resources and seeks to end routine gas flaring at oil production sites no later than 2030. Instead, the World Bank wants the resources to be used for productive proposals like generating electricity and, according to H2-Industries' CEO Michael Stusch, that is what the pyrolysis technology can achieve:

"Pyrolysis is when a solid, or a liquid, undergoes thermal degradation into smaller volatile molecules without interacting with oxygen or other oxidants. It is essential to understand that pyrolysis is not a phase change but a chemical process. It is a thermal degradation process that occurs under heat and degrades larger molecules into smaller ones," he explained.

Flare gas composition differs from flare to flare; therefore, the pure methane (CH₄) needs to be separated with membranes that remove the various blends of carbon hydrates so that only pure CH₄ remains. This CH₄ is then cracked in a methane pyrolysis process into clean hydrogen and solid carbon with no CO₂ emissions released into the atmosphere.

Hydrogen bound in LOHCs

The technology is delivered in self-contained 20 or 40-foot ISO containers and can be pre-assembled in a semi-serial production and shipped for installation to the flaring site. The process provides clean hydrogen bound in liquid organic hydrogen carriers (LOHC) which are organic compounds that can absorb and release hydrogen through chemical reactions.

"LOHCs can therefore be used as a storage medium for hydrogen. H2-Industries has developed and commercialized the use

of LOHC to make hydrogen handling safer and cheaper. With LOHC, the volatile hydrogen gas no longer needs to be cooled or compressed in a costly and energy-intensive manner to enable economical transport," Stusch explained.

Any process is only as economic and ecological as its primary feedstock, and in the case of H2-Industries, the critical feedstock is a waste product. But the process also needs electricity, supplied by internal power generation units that do not use fossil fuel energy sources or the grid. CO₂-free electricity can be provided either by hydrogen fuel cells that transform the hydrogen produced on-site into electrical power or Organic Rankine Cycle (ORC) units that recover heat from the hydrogen storage in LOHC units and wasted heat from the water gas shift process to produce power for the entire process.

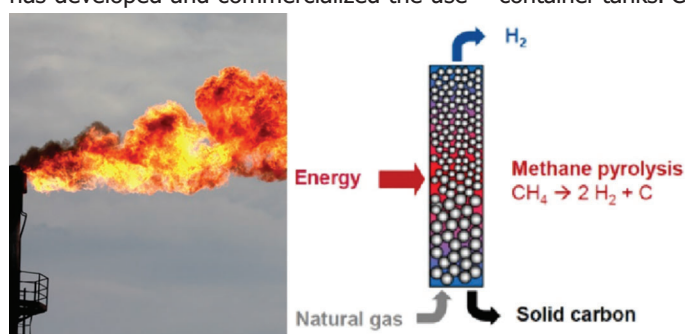
Producing clean H2 for cheap

The process can produce up to 100 kg of clean hydrogen and 730 kg of solid carbon from a tonne of flaring gas. A typical, medium-sized oil platform releases 13,500 tonnes of flaring gas annually, and a single H2-Industries 'Flare to Hydrogen' container can produce 158 tons of clean hydrogen per year. By processing 100 million tons of flaring gas per year, the amount flared in 2021, ten million tonnes of clean hydrogen can be produced.

"The clean hydrogen comes for between \$2 and \$3 per kg, while market price levels are between \$3 and \$4 for grey hydrogen and \$7 for CO₂-emission-free hydrogen," Stusch pointed out.

The only by-product of the process is solid carbon black that can be shipped for export to any place in the world using ISO container tanks. Carbon black is mainly used

to strengthen rubber in tires. But it can also act as a pigment, UV stabilizer, conductive or insulating agent in various rubber, plastic, coating applications, and other everyday use, including hoses, conveyor belts, shoes, and printing. ■



GE starts fixing HA gas turbine rotors in Singapore

GE has enhanced the scope of its solutions centre in Singapore to include HA rotor repair, a crucial service to ensure long-term reliability and availability of H-class turbines over their life-cycle. The fastest growth of installed H-Class turbines is taking place in Asia, where GE achieves up to 90% self-sufficiency in repairing heavy-duty gas turbines.

The broader repair capability allows GE to provide faster support for power plant operators, reducing repair times of crucial equipment of combined-cycle units. Following GE's 2019 announcement to invest up to \$60 million over ten years into its Repair Solutions Centre in Singapore, the company also celebrated the repair and return delivery for the 100th set of Hot Gas Path components – a crucial element of HA turbines.

Servicing becomes vital as HA turbines mature

"This project marks our focus to improve our supply chain capabilities, which is crucial as GE's largest and most advanced gas turbine will continue to mature and age" said Amol Mody, president for services, Asia Pacific and South Asia at GE Gas Power. In recent years, GE saw orders for HA gas turbines grow significantly in Asia to help meet growing electricity demand as countries switch away from coal-fired power.

Opened in the 1970s, GE's repair centre in Singapore initially performed marine and offshore repairs but has since evolved to include power generation repairs and servicing of gas turbines. Since 2019, the centre has grown from 250 to about 350 employees in four years, adding positions for both GE's HA and Aero-derivative repair teams.

Today, it is the first HA repair development centre outside of the U.S. and also handle F-class bucket repair and combustor DVM coating. ■

GE works with Norway's Northern Lights on end-to-end CCS solutions

Northern Lights, a Norwegian developer of CO2 transport and storage infrastructure, will work with GE to accelerate the deployment of end-to-end carbon capture and storage (CCS) solutions applied to power plants driven by GE gas turbines. Both companies will develop technical and logistical solution with the aim of developing an effective CCS supply chain.

Ownd by Equinor, Shell and Total Energies, Northern Lights is developing the world's first open source infrastructure to transport CO2 from industrial emitters in Europe. The CO2 will be transported by ship to a receiving terminal at Øygarden, west of the Norwegian coastal town Bergen, from where it will be transported by pipeline to a geological reservoir 2,600 meters under the seabed for permanent storage in. Operations are scheduled to start in 2024.

Retrofitting CCGTs with carbon capture

Carbon capture and sequestration can help to drastically reduce CO₂ emissions in the electric power and the industrial sectors to



Northern Lights site near Bergen

mitigate climate change. Martin O'Neil, vice president of strategy for GE Gas Power explained the collaboration with Northern Lights on compatible CO2 transfer systems is mainly aimed at reducing emissions from gas-fired power plants.

To curb power sector emissions, GE has developed relationships with technology providers and utility customers including Linde, Technip, NetZero Teesside, and Southern Company.

In March, the US manufacturer started a collaboration with Svante to develop sold sorbents to capture carbon from gas-fuelled power generators through plant retrofits. In addition, the first Direct Air Capture (DAC) prototype unit was tested in GE's climate action lab in Niskayuna, NY.

In 2022, GE's front-end engineering design (FEED) study "Retrofittable Advanced Combined Cycle Integration for Flexible Decarbonized Generation" received funding from the U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management to develop a detailed plan for integrating carbon capture technologies with a combined-cycle gas power plant to capture approximately 95% of carbon dioxide emissions with a goal of commercial deployment by 2030.

Technip and Bechtel deliver pre-FEED on RWE's Humber Bank project

RWE has contracted Technip Energies and Bechtel to deliver pre-FEED carbon capture engineering and design studies for its proposed 800 MW Stallingborough combined-cycle power project with carbon capture near the Humber Estuary in East Yorkshire. The award follows shortly after RWE announced plans to retrofit CCS technology at its existing CCGTs at Pembroke and Staythorpe.

The Essen-based utility with a Europe-wide generating fleet considers CCS as a viable solution to help its UK fleet of gas-fired power stations meet the country's decarbonisation targets.

All three power projects – Stallingborough, Pembroke and Staythorpe – are close to proposed CO2 networks or have access to shipping facilities, so the carbon could be safely transported and stored.

For the Stallingborough project, Technip and its partner GE Gas Power will develop a pre-FEED (Front-End Engineering and Design) studies to equip the proposed combined-cycle power plant with an integrated carbon capture unit. In addition, Bechtel will complete another pre-FEED study to inves-

tigate alternative technology choices.

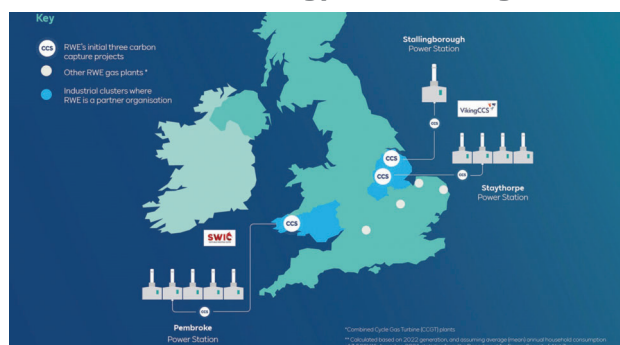
The developer wants to receive the re-

German regulator spurs grid investment with higher interest rates

Germany's Federal Network Agency (BNetzA) is seeking to accelerate the power grid expansion by raising the equity interest rates for new projects by 40%, allowing companies to reap a higher return on their invested capital. Adjusted for tax, the regulated equity yield for 2024 is now 7.09% for new investment, the regulator said.

Equity rates have caused some controversy in recent months, as BNetzA was initially reluctant to raise rates despite urgent calls from transmission system operators. The regulator had feared that costs for grid users – consumers, industry or commerce – would increase with higher rates.

However, the German electricity grid urgently needs to be expanded to ensure it can handle a shift away from utility-scale fossil power plants towards more decentralised, intermittent renewable energy sources. To achieve the government's target of becoming climate neutral by 2045, the country's industry will increasingly rely on electricity as their main energy source which requires new distribution lines. ■



sults of the studies ahead of its submission into the government's Track 2 Phase 2 cluster sequencing. If approved and its CCS projects get funding, RWE would be prepared to invest a total of up to £15 billion in new clean technologies and infrastructure in the UK by 2030. ■

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