



Democrats use SCC as tool against gas projects

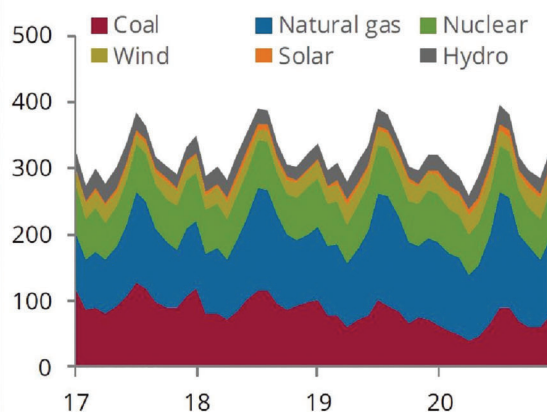
Raising the Social Cost of Carbon (SCC) is becoming a tool for US Democrats to obstruct upstream gas projects, notably leases for shale gas fracking, critics warn. Analysts at Energy Aspects believe the bar for federal approval of new fossil fuel infrastructure will rise further, once the Democrats gain majority of the Federal Energy Regulatory Commission (FERC) in July.

The regulatory agency currently has a 3-2 Republican majority, but one of the Republican seats is set to expire in June. The latest victories of two Democratic Senate candidates in Georgia's runoff election have put the Democrats in control of the nomination process of the new FERC commissioner. The victories empowered the Democrats to a 50:50 share in the Senate – on par with the Republicans – but Vice President-elect Kamala Harris can use her tie-breaking vote and allow the Democrats to instate President Joe Biden's first pick for the vacant FERC seat.

Biden's main goal is to decarbonise the US power generation sector as well as related gas upstream projects, and implement a push to "electrify everything" on the demand side. "A headlong assault on oil and gas producers would be a politically costly distraction, so he will not ban crude or LNG exports, and tax subsidies for producers



US electricity generation by main sources, TWh



Source: EIA, Energy Aspects

are also likely to survive," analysts at the London-based consultancy Energy Aspects commented.

SCC – an impactful tool

The order to revise the Social Cost of Carbon (SCC) was signed into law on Biden's first day in office, but the full extent of the changes is not entirely clear yet. The novel SCC could impact the approval of new pipelines, permitting for oil and gas wells and initiate a review of royalty rates.

As an interim step, the Biden administration has raised the SCC to \$51 per tonne, in line with the level set by the Obama adminis-

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Batteries in focus of President Biden's 'Buy American' policy

President Joe Biden's 'Buy American' policy mandates that half of the batteries for the federal government's vehicle fleet are made in the US. In contrast, Europe's has only a 40% local content threshold for electric vs. petrol-based cars, but this will rise to a comparable 55% by 2027.

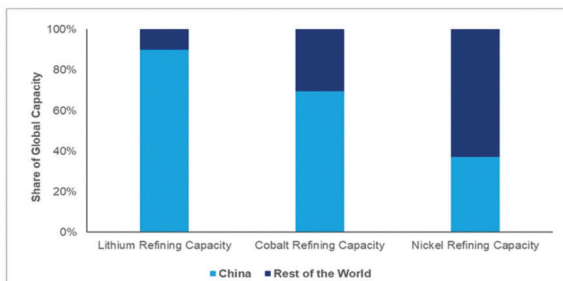
Similar as in the United States, governments in Europe are encouraging investment in battery factories to replace traditional engine plants. The aim is to shorten supply chains and keep the industry alive in competition with Asian rivals.

However, these political goals will be hard to realise given that China currently produces nearly 75% of lithium-ion batteries worldwide, and is building out its factories. So despite efforts in Europe and the US to encourage domestic battery production, analysts say "there has been a distinct lack of support for investment in the supply and refining of the raw materials to achieve this. In China, the opposite holds true."

Contest for key metals

But China does not have it all its own way in the contest for key metals used in EV production –

China's share of global battery raw material refining capacity



Source: Wood Mackenzie Battery Raw Materials Service

lithium, nickel and cobalt. "China remains hugely dependent on foreign miners, for example, for its supply of copper – the country is net short to the tune of around 9 million tons per annum (mtpa) – with only limited equity ownership of resources around the world," commented Gavin Montgomery and Milan Thakore from Wood Mackenzie's battery raw materials team.

"Just as with iron ore, despite considerable

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tration, which the former President Trump had lowered to \$7/t. Environmentalists advocate an SCC value as high as \$125/t to factor in the current low interest rates and the global impact of US air pollution, but President Biden is known to favour a robust and transparent process to gradually increase the prices level towards \$100/t.

Infrastructure package focuses on green energy

Eager to rekindle the US economy in the

wake of the Covid-19 pandemic, President Biden has signed an infrastructure package into law that will cost between \$2 billion and \$4 trillion, including nearly \$600 billion for decarbonisation priorities. Analysts cautioned that any "spending on that scale would need to pass via budget reconciliation to avoid the filibuster and could require some tax increases to fund it."

Fossil fuel producers are particularly wary about the impact of a new federal Clean Energy Standard (CES) that would push elec-

tric power companies to achieve a zero-carbon portfolio. Alternatively, electric utilities could use "some creative design to allow it to pass via the reconciliation process," analysts commented.

Combined, a CES along with the Environmental Protection Agency's (EPA) more stringent emissions rules for power plant is expected to cause a significant shift of the US power sector towards wind and solar power, hydrogen-fuelled power generation and energy storage. ■

Total partners with Siemens Energy to reduce LNG-related emissions

Total and Siemens Energy have joint forces to study new technology to curb emissions at LNG facilities and associated power generators. The aim is to deliver industrial-size solution on combusting hydrogen in gas turbines, all-electrical liquefaction, and integrating renewables with LNG-fuelled power units.

Each partner will bring together their best-in-class technologies and combine their know-how to deliver industrial-stage solutions. Total aspires to further reduce the carbon footprint of our activities, especially in the company's strategic LNG business, and Arnaud Breuillac, President Exploration & Production at Total, is convinced the cooperation with Siemens Energy will help achieve this goal.

"This collaboration with Siemens Energy, a major player in the energy technology sector, brings many opportunities to further reduce the carbon footprint of our activities, especially in our strategic LNG business," he said. "The development of low-carbon LNG will contribute to meet the growth in global en-

ergy demand whilst reducing the carbon intensity of the energy products consumed. Reducing its carbon footprint is essential for LNG to play its role fully in the energy transition."

Curbing CO2 at greenfield LNG projects

Both partners will be looking at ways to reduce carbon footprint of brownfield and greenfield LNG projects, said Thorbjörn Fors, Executive Vice President of the Industrial Applications Division at Siemens Energy.

"The agreement is a next step, following our announcement last June to collaborate together and conduct studies exploring possible liquefaction and power generation plant designs to help decarbonise the pro-



duction of LNG," he explained.

The French oil and gas major Total is the world's second largest privately owned LNG player, with a global portfolio of nearly 50 million tons per annum (mtpa) by 2025 and a global market share of around 10%. Through its interests in liquefaction plants in Qatar, Nigeria, Russia, Norway, Oman, Egypt, the United Arab Emirates, the United States, Australia and Angola, the Total is able to sell and trade LNG on all markets worldwide. ■

Continued from page 1

efforts China has struggled to significantly increase its share of global copper resources," analysts added.

So, if the pace of EV production and ownership is to really take off in Europe and the US, must be a huge increase in the production and refining of the key metals to

achieve this. Wood Mackenzie's base case sees nickel production rise by almost 70% by 2040, while cobalt and lithium demand will increase by 200% and 600%, respectively, over the next two decades. And if the world decarbonises more rapidly, demand rises far faster.

Scramble to source cobalt from Congo

Eager to reduce its dependency on precious mineral imports, Chinese has made substantial efforts to increase its ownership of, and access to, these, from cobalt resources in the Democratic Republic of Congo (DRC) to lithium reserves in Chile and Indonesian nickel mines. Moreover, access to state capital and lower requirements on return also give Chinese manufacturers a competitive edge and more appetite to operate in high-risk areas.

Almost three-quarters – and rising – of global cobalt production comes from the DRC, where western miners face prohibitive

environmental, social and governance risks, analysts said, pointing out: "It is no coincidence that China's cobalt refining capacity almost exactly matches the DRC's share of global output."

Congo produces 60% of the world's supply of cobalt, and output is growing fast but has been beset with concerns about illegal mining and corruption. Zhejiang Huayou Cobalt and Glencore own major minefields in Congo where the children worked whose families have filed a lawsuit to seek damages over death and injuries of child miners.

Faced with potential tariff barriers, Chinese and other Asian battery manufacturers are expanding their footprint overseas. China's SVOLT has now confirmed it will build a 24-GWh plant in Germany, with cell production scheduled to begin in 2022, and module production the following year. And in other parts of Europe and the US, battery makers from South Korean and Japanese are striving to build new manufacturing capacity. ■

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GenCell raises \$14.3 million from BNP Paribas-led investor group

Israel's fuel cell manufacturer GenCell has raised \$14.3 million in debt capital from a group of institutional investors. BNP Paribas Energy Transition Fund led the round with \$8 million, followed by TDK Ventures who just announced a partnership with GenCell for the development of green ammonia.

The banks' investment into GenCell will be carried out at a price of 13.5 Israeli New Shekels (US\$4.1) per share, the company said, which is a 4.6% discount on the share price at the close of business on April 7, 2021. "We are pleased to finalize our initial investment in GenCell, whose innovative fuel cell and hydrogen technologies closely align with the sustainable finance values and guidelines directing our investments," Edward Lees, director of the BNP Paribas Energy Transition Fund (BNPP) commented on the deal.

BNPP manages assets in the volume of €6 billion with a major focus on the green energy sector. It believes hydrogen and fuel cells have a strong role to play in the transition to a low carbon economy, whether in mobility, in industry or in energy storage, so the investment in GenCell is hoped to "accelerate their technology's time to market," Lees explained. The bank already invested smaller amounts in companies like the fuel cell supplier Ballard Power Systems.

Low-cost approach for green ammonia

The investment into GenCell follows the company's latest announcement to work closely with the Japanese consortium TDK to develop green ammonia.

In February, TDK and GenCell agreed to invest \$85 million into developing a low-cost approach for green ammonia. The new low temperature process is designed to produce carbon-free ammonia that could replace the 235 million tons of industrial ammonia produced today, worth an estimated \$70 billion.

Ammonia is expected to grow into a market with 1 billion ton per annum of global production, as power generators and industry turn to the fuel to realise decarbonisation goals.

Broadening scope to hydrogen

GenCell, based in Petah Tikva, Israel, has 90 employees who developed a process to cre-



GenCell's patented catalyst, part of alkaline fuel cell manufacturing

ate hydrogen-on-demand from anhydrous ammonia (NH₃). This enables the company's proprietary fuel cells to produce primary power for off-grid and poor-grid sites, as well as rural electrification. Going ahead, researchers will now work on designs and concepts for green ammonia synthesis and translate them into a repeatable process in order to streamline and economize ammonia production.

Striving to broaden its scope, GenCell wants to not only produce clean power from fuel cells but also green hydrogen - the fuel on which the company's alkaline fuel cells run. ■

Mitsubishi HI buys stake in Starfire to enter green ammonia market

Japan's Mitsubishi Heavy Industries (MHI) has invested in Starfire Energy, a Colorado-based developer of chemical plants for the production of hydrogen and green ammonia. MHI said it wants to scale up Starfire's patented ammonia cracking and purification technology, with the aim of producing zero-carbon fuel for utility-scale gas turbines.

Researchers at Starfire Energy have verified that a blend of 70% ammonia + 30% cracked ammonia can burn well in a conventional natural gas burner, using a stoichiometric fuel-air mixture. For example, a 10 MW turbine or internal combustion engine using such a blend would need about 1.44 tonnes of cracked ammonia per hour to produce clean electricity. However, there are thermodynamic limitations as residual ammonia can damage proton exchange membrane devices, which is why Starfire patented an adsorption ammonia and removal process. The aim is to use ammonia

at scale, e.g. as a fuel for industrial-size power plants, ships, lorries or to produce process heat for the steel and cement industry or for fuel cell vehicles.

Investors' consortium includes Chevron and Osaka Gas

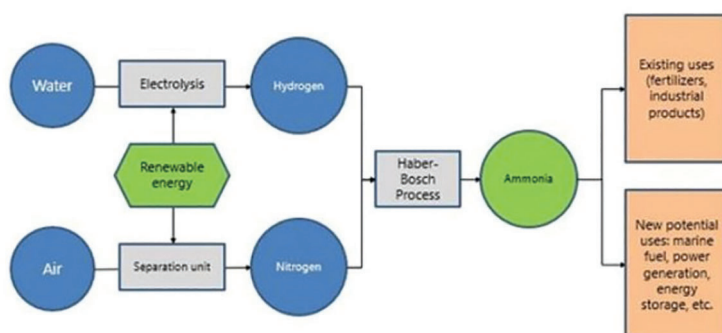
MHI said its investment of MHI in Starfire Energy was executed through a consortium

that also includes AP Ventures, Chevron Technology Ventures, New Energy Technologies and Osaka Gas.

"We view clean ammonia as an important new energy source for fuel use and hydrogen carriers and we are committed to expanding the hydrogen and ammonia value chain from production to utilization by developing technologies such as the hydrogen and ammonia gas turbine," said Ricky Sakai, vice president of new business development at Mitsubishi Heavy Industries America. He added MHI America is "eager to partner with innovative technology and solution providers," and expressed confidence in Starfire Energy's technology to create distributed ammonia production solutions that help industries decarbonise.

Mitsubishi Power, part of MHI, has developed a hydrogen-ready gas turbine and is actively researching ways to produce carbon-free hydrogen and ammonia, as well as capturing CO₂ and converting it to synthetic fuels. ■

Green ammonia production and end uses



Scheme of Starfire Energy's patented NH₃ system.

RFB systems emerge as rivals to dominant Li-ion batteries

Lithium-ion based batteries are still dominating the stationary energy storage sector but a rising number of companies try to develop different technology types. Among the Li-ion batteries competitors, the Redox Flow Battery (RFB) system – based on flowing two liquids as electrolytes across the electrode – is seen as an attractive approach.

The RFB principle, developed by researchers in Cambridge, UK, functions by letting two liquids with electroactive species flow across the electrode which creates a chemical reaction that generates electricity.

Though Li-ion batteries are expected to dominate the market for the time being, analysis carried out by IDTechEx finds that Redox is emerging as a “promising com-

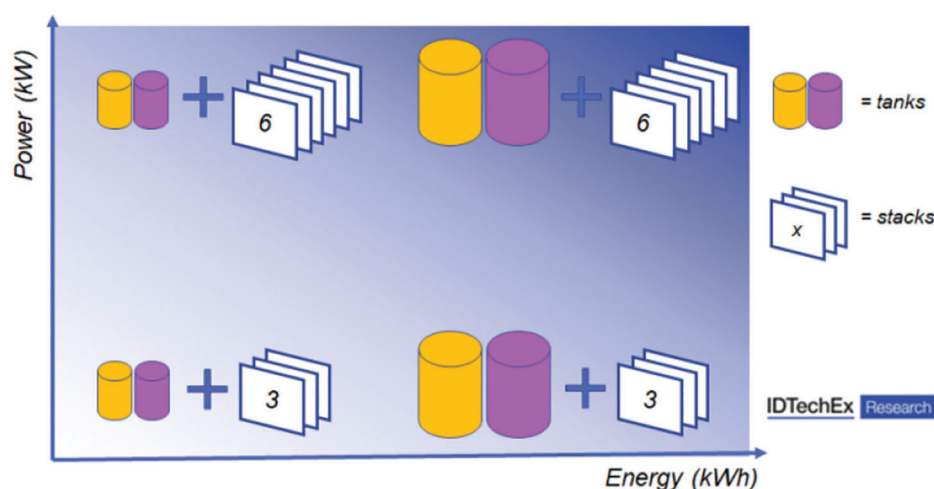
petitor.” That’s because RFBs can store energy for longer than the average 4 hours of a Li-ion system. “The larger the amount of electrolyte, the bigger the amount of energy stored in the battery, analysts explained, while the electric power output of a RFB is defined by the size of the electrode stack and the kinetics of the chemical reaction.” In contrast to Li-ion batteries, RFB batteries have a decoupled

energy and power capacity which allows a bigger customisation of this kind of system.

Vanadium used as electrolyser

Looking into electrolysers, there are different types of electroactive species which have been investigated to increase the efficiency of RFB systems. The first and most used Redox Flow Battery chemistry is the Vanadium redox flow battery, which is today the most studied and manufactured technology of its kind. Researchers stressed that all RFB battery types, the vanadium technology – and similarly the All-Iron RFB one – use vanadium as the electroactive species, though with different oxidation states.

However, the high cost of vanadium as a raw material and the low round-trip efficiency of the RFB solution are main drawbacks, analysts at IDTechEx noted. “The electrolyte alone accounts for 30% to 40% of the overall technology cost. To reduce the effect of vanadium cost on the overall system, an increasing number of companies started collaborations with vanadium mining companies,” they pointed out.



RFB systems decouple electric power and energy capacity

Addition of battery energy storage in the US to top 59 GW by 2050

Significant amounts of new battery storage capacity will be added to the US electricity grid over the coming years to balance rising in-feed of intermittent renewable power supply. According to the US Energy Administrations' (EIA) 2021 Outlook, which reflects current laws and regulations, over 59 gigawatts (GW) of battery storage will serve the grid in 2050.

Battery storage systems typically charge, or store, electricity during hours of the day with relatively high energy supply, low energy demand, and low power prices. The batteries are then available to discharge electricity during hours with low supply, high demand, high power prices, or when the grid needs backup capacity for reliability.

With more wind and solar power units added across the US, particularly along the coast and in the southern states, grid operators are struggling to balance ever larger amounts of non-dispatchable renewable

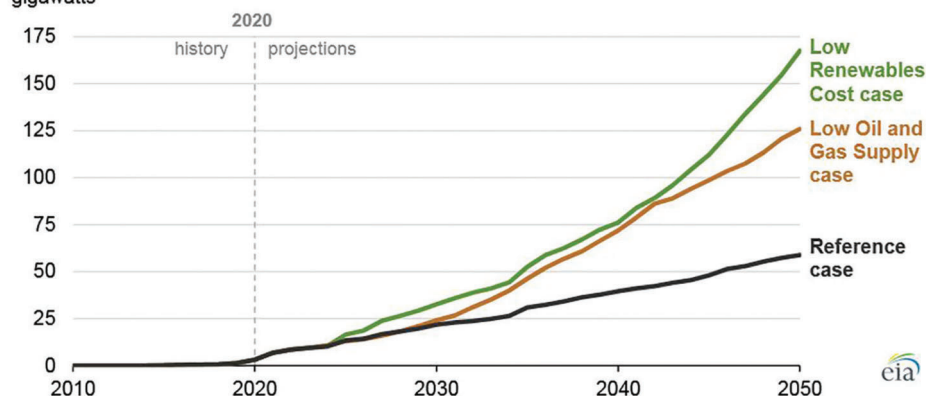
power supply by deploying flexible fast-start peaking plants or energy storage units.

Looking at costs, the deployment of batteries is getting increasingly attractive due to falling technology costs. Moreover the application of the US Investment Tax

Credit incentivises electric utilities and grid operators to co-locate storage systems near onshore wind farms or solar photovoltaic (PV) parks.

Most battery storage systems installed in the US are lithium-ion batteries.

U.S. battery storage power capacity (2010–2050)
gigawatts



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2021*

German carmakers set to profit from global e-vehicle boom

Carmakers in Germany cash in on the global shift to e-mobility. Though the production of battery cells is dominated by businesses in South Korea, Japan and China, German companies have caught up and reached a leading position on technologies like cell chemistry, cooling and control systems for car batteries and energy storage.

“In the coming years, many battery manufacturers will settle in Europe. We stand ready as a supplier,” Matthias Zachert, CEO of Cologne-based chemicals company Lanxess told the German business daily Handelsblatt. Other big players like BASF and Wacker Chemie are also seen to be in a “good starting position to profit from a growing e-mobility market,” analysts commented.

Though Germany's carmakers are eager to accelerate their electrification plans, most jobs in the country's automotive supplier industry still depend on the combustion engine. Hence, lobby groups like VDA are adamant in saying the combustion would play a part of a clean mobility future – if synthetic fuels are used.

E-vehicle sales defy pandemic thanks to subsidies

Globally, the sale of electric vehicles in 2020 has defied the pandemic and exceeded expectations by the International Energy Agency (IEA). Though the Covid-19 health crisis caused an unprecedented fall in sales of petrol-based cars, purchases of e-vehicles increased to over 3 million and reached a market share of over 4% – not least due to favourable policies and subsidies.

The lockdown affected electric car sales, but stimulus measures made this market more resilient. In Germany the government granted purchase subsidies of €9,000 for each first-time buyer of an e-car between June 2020 until the end of 2021, and the VAT rate on e-car sales had been reduced 19% to 16% until the end of 2020. In France, the so-called ‘cash-for-clunker’

scheme was increased for first 200,000 vehicles to €5,000 for the purchase of an electric vehicle, and to €3,000 for other cars.

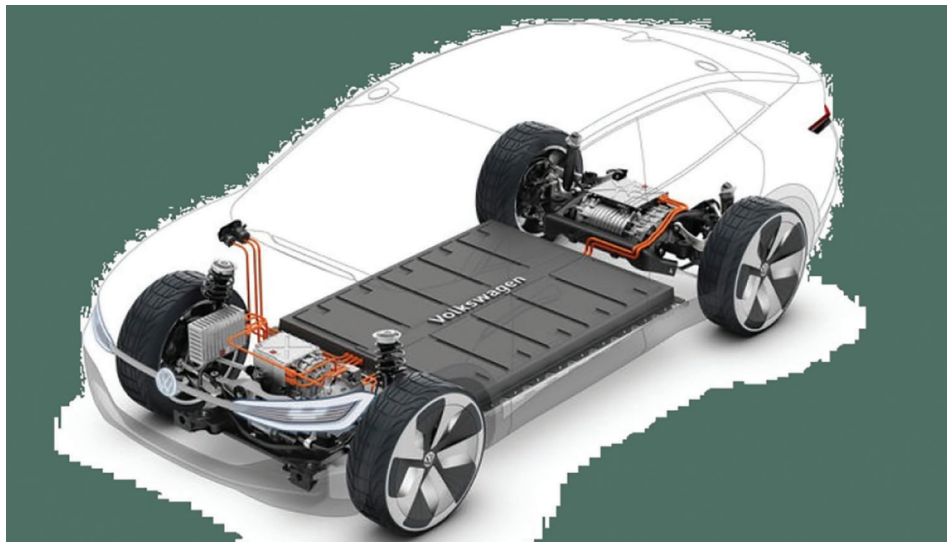
Moreover, the fall in battery costs and equipment improvements in both model and choice performance helped drive buyers' enthusiasm, though analysts noted that most e-cars were bought by affluent households less affected by the economic downturn.

VW sells more electric cars than Tesla

In February, Volkswagen announced has sold more electric cars worldwide than Tesla for the first time ever, as electrification of transport accelerates in Europe, the US and China. The brands of the VW group, which include Porsche and Audi, sold 192,000 fully electric cars or plug-in hybrid vehicles in the fourth quarter, compared to Tesla's 181,000 e-vehicles sold.

Europe overtook China as the world's largest e-car market with sales of 1.4 million in 2020, and the global share of electric cars in new registrations more than doubled within a year to almost 6% at the end of 2020, according to a report by the consultancy AlixPartners.

“The e-car market is experiencing an unprecedented surge in demand worldwide, from which German car manufacturers in particular are also benefiting,” said the authors of the report, Nicolas Franzwa and Marcus Kleinfeld. German carmakers – often described as sleeping giants with regard to e-cars – are now catching up, they said, noting the study proves “they are [now] putting their sales horsepower on the road in e-vehicles as well.” ■



NEWS NUDGES

Tulsa dDSF helps curb NOx emissions by 74%

Tulsa Technologies, a leader in propulsion technology, and Cummins have showcased the results of a study on the effectiveness of Tulsa's diesel Dynamic Skip Fire (dDSF) in reducing nitrogen oxides (NOx) by 74% and carbon dioxide emissions by 5% on a Cummins X15 HD Efficiency Series diesel engine. In comparison with current engine technologies and modifications to the thermal management techniques, use of the dDSF system saved 20% in fuel and related costs.

BASF's power demand set to triple

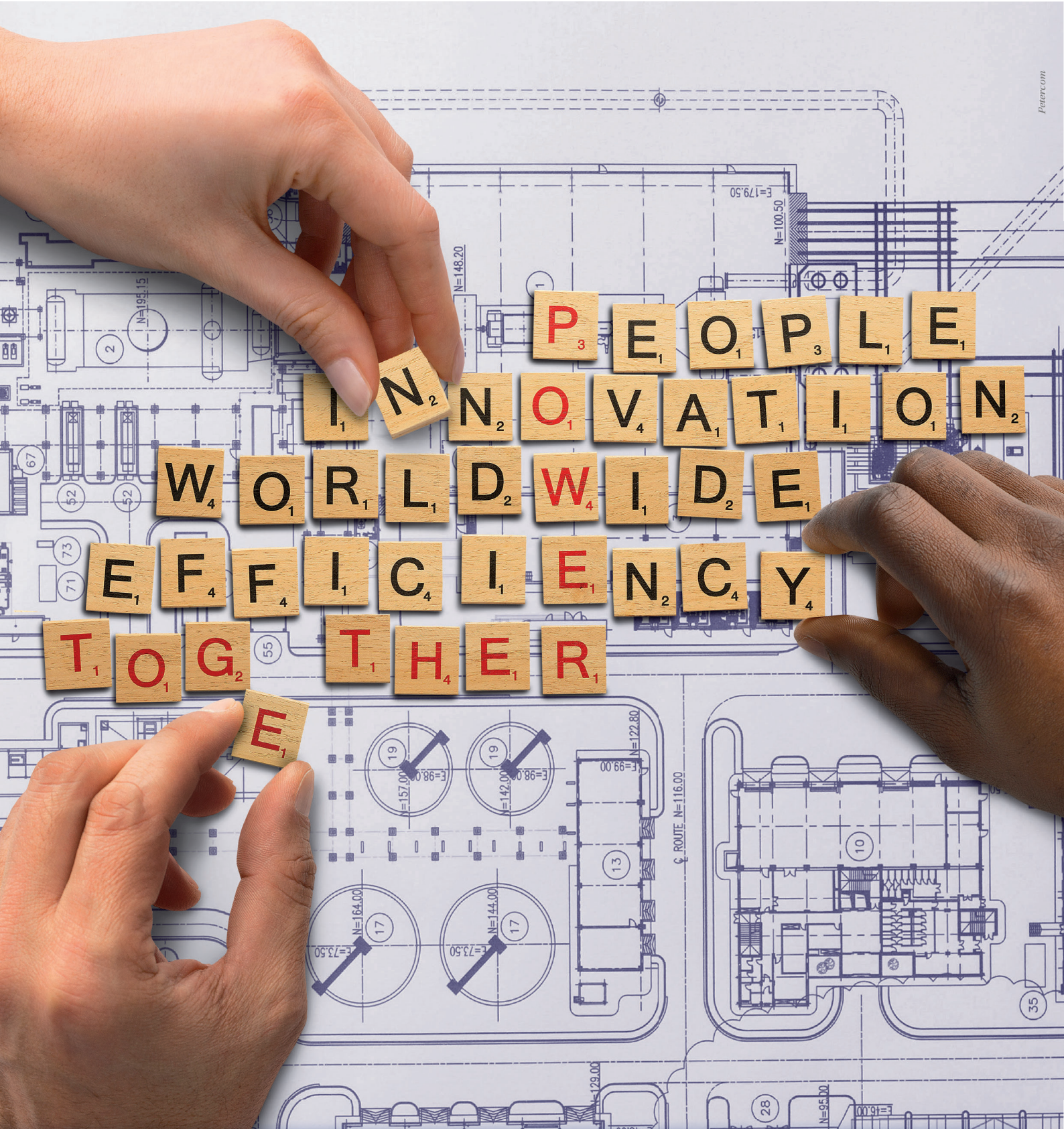
Chemicals group BASF expects its electricity consumption will triple to over 44 TWh per year by 2035, rising from 14.7 TWh last year. The growth estimate is based on demand forecasts for Ludwigshafen, the group's biggest site, where energy demand is anticipated to rise from 6 TWh to around 20 TWh. Currently, BASF meets most of its electricity needs with combined-cycle power stations, many of which are installed on or nearby its chemical production sites. The company has site in 390 locations worldwide.

Romgaz pulls the plug on Iernut CCGT

Romania's Romgaz has terminated a contract for the construction of a 430 MW combined-cycle power plant in Iernut, in Romania central Transylvania region. The construction consortium consisted of DuroFelguera and Romelectrico.

Wärtsilä test bio LNG fuel at Coast Guard vessel

Gasum, Finland's state gas company and biogas refiner is supplying Wärtsilä with green fuels that are currently being tested in a Coast Guard patrol vessel. The 96 metre long ship, the named 'Turva', is fitted with Wärtsilä dual-fuel engines. Use of Bio LNG, a 100% renewable fuel, emits no particulate matter, and close to zero nitrogen oxides (NOx) and sulphur oxides (SOx) when burnt and has over 90% lower CO2 emission compared to conventional fuels. ■

A close-up photograph showing three hands of different skin tones placing wooden letter tiles onto a technical architectural drawing. The tiles are arranged to spell out 'PEOPLE INNOVATION WORLDWIDE EFFICIENCY TOGETHER'. The drawing in the background features various technical symbols, dimensions, and a floor plan of a building. The tiles are light-colored wood with black or red letters and small numbers in the corners.

PEOPLE
INNOVATION
WORLDWIDE
EFFICIENCY
TOGETHER

Power Together

Manufacturing and technological capabilities,
design expertise,
innovative spirit and ability to deliver results,
to offer tailor made solutions based on Customers' needs.

ANSALDO
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SSE, Equinor join forces to build world's first hydrogen power plant

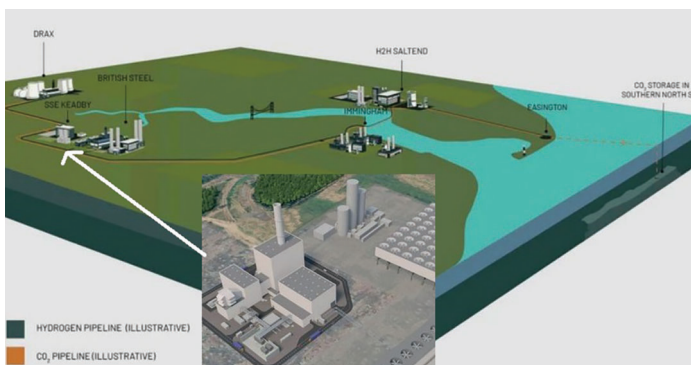
SSE, one of the UK's Big Five energy companies, and the Norwegian energy firm Equinor have agreed to cooperate on developing the world's first 100% hydrogen-fuelled power plant in Britain. The Keadby Hydrogen plant is designed to use up to 1,800 MW of hydrogen to generate 900 MW of carbon-neutral electricity.

Situated in northeast England, in the heavily industrialised Humber region, the Keadby Hydrogen has been designed as a pilot project showcasing a way to replace fossil fuels with green hydrogen, generated from wind and solar energy, as a power plant fuel.

Keadby-3 CCGT built near hydrogen plant

Developers aim to commission the plant before 2030. "With appropriate policy mechanisms in place, Keadby Hydrogen could come online before the end of the decade," SSE and Equinor said. The British-Norwegian team also plans to develop a 900 MW combined-cycle gas power plant nearby, named Keadby-3 CCGT, that will be equipped with carbon capture storage (CCS) technology.

The Keadby Hydrogen plant and the Keadby-3 CCGT will be built in close vicinity, with Keadby-3 scheduled to start operations in early 2027. SSE and Equinor said they will submit a development consent application to the UK government this spring. The car-



Render of Keadby-3 plant within Net Zero Humber project

bon dioxide, captured at Keadby-3 will be permanently stored under the seabed in the Southern North Sea.

H2H Saltend to produce grey hydrogen for Keadby

Equinor is also participating in project aspiring to produce hydrogen from natural gas – also known as 'grey hydrogen' – at Saltend Chemicals Park near Hull, UK, where the associated CO2 will also be captured and permanently stored. The so-called H2H Saltend

project could supply low-carbon hydrogen to the Keadby Hydrogen power plant, Equinor said.

Though green hydrogen, produced from renewables, is the only viable Zero-CO2 fuel source today, most of the hydrogen in the world is still produced from natural gas in a process known as

steam-reforming. This grey hydrogen is not sustainable, but CCS can reduce the associated emissions by around 90%.

The British government has set a target to reach Net Zero carbon emissions by 2050, hence the government provides financial support and other incentives to a number of decarbonisation projects. Several projects on producing hydrogen, co-firing hydrogen in natural gas-fuelled power stations and energy storage are at various stages of development. ■

McDermott, New Energy complete EPC on green hydrogen plant

McDermott's CB&I Storage Solution and New Energy Development have completed engineering works for two modular plants, capable to produce nearly 24,000 kilograms per day of hydrogen. Each 50 MW unit uses renewable power for a series of electrolyzers that split water into green hydrogen and oxygen.

The plant's innovative technology allows for incremental 15 MW generation of 100% hydrogen-fuelled electricity that in turn supports grid-scale energy storage applications.

New Energy said its proprietary design for hydrogen production plants is "ideal for grid-scale blending" whereby hydrogen is injected into natural gas transmission pipelines or into storage.

Striving to make turbines 'hydrogen-ready'

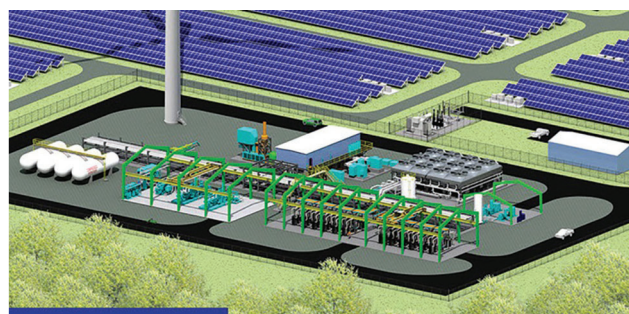
Alternatively, the green hydrogen can also be used to co-fire power stations to reduce emissions during the combustion process. Most of the gas turbine manufacturers – notably GE, Siemens, Ansaldo, Mitsubishi, Wärtsilä and INNO Jenbacher – are busy working on concepts to make their gas turbines adapt to partially run on hydrogen fuel, or even ammonia.

Electric utilities and energy-intensive man-

ufacturers all over the world are looking for tangible and cost-effective solutions to decarbonise, and Cesar Canals, Senior Vice President of CB&I Storage Solutions pointed out the novel design, created together with New Energy, "provides a valuable hydrogen solution to accomplish that goal."

Long Ridge CCGT converted to hydrogen

In the US, Black & Veatch will be retrofitting a GE H-class turbine at the Long Ridge Energy's 485 MW combined-cycle power plant to run on a blend of natural gas and carbon-free hydrogen. The Hannibal, Ohio-based CCGT initially will burn 5% hydrogen by volume in the natural gas stream but operators are striving to make the necessary technical changes to ramp up the share of hydro-



Green Hydrogen Production, Storage and End-use

New Energy Development Company
STRATEGY | PROJECT DEVELOPMENT | CAPITAL

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gen co-firing.

Ultimately, the Long Ridge CCGT is meant to run 100% on hydrogen and generate carbon-free baseload power.

"We strongly believe that hydrogen will have a very prominent role and we will continue to apply our collective expertise to make that future a reality," Matthew Harwood, McDermott's Senior Vice President of Strategy, Risk and Sustainability concluded. ■

EDF sells West Burton B gas power plant to US investment firm EIG

EDF Energy has found a buyer for its only gas-fired power station in the UK. The US investment firm EIG agreed to acquire the 1.332 MW West Burton B plant along with an integrated 49 MW battery energy storage. Both parties want to complete the deal "as soon as possible," EDF said, pending regulatory approvals.

West Burton B, a large combined-cycle power station in Nottinghamshire, has been started generating electricity in 2013, following a five-year construction period. The CCGT used to produce enough electricity for approximately 1.5 million UK homes and operations were partially supported by capacity contracts.

Shortly after commissioning, an EDF spokesman told Gas to Power Journal that

West Burton B would become "an integral part of a balanced energy mix, which can flexibly generate electricity when needed, in conjunction with low carbon energy generation like nuclear power and renewables." At the time, EDF Energy committed to invest £3.5 billion in the UK over three years.

Shifting focus to nuclear

These days, however, EDF has shifted its UK focus to nuclear power notably on the Hink-

ley Point C project that is currently under construction. As a consequence, the French utility announced the closure of Burton A - its sole remaining coal-fired power station in the UK - by September 2022. The closure date is two years prior to a government deadline, part of a wider effort to phase out all of country's coal power stations in an effort to reach Net Zero emissions by 2050.

The B unit was initially designed as a coal-fired power station, but never built. Instead, the former operator opted to build West Burton B as a combined-cycle gas power unit starting from 2008 with works completed in 2013. Still, profitability of gas-fired power in the UK has suffered due to high wholesale gas prices in recent years. Despite worries over capacity shortages and potential brownouts many gas plants have been mothballed or shut down amid adverse fuel economics.

Washington-based EIG is a leading institutional investor to the global energy sector with \$22.0 billion under management as of December 31, 2020. Over the past four decades, private investor has committed over \$34.9 billion to the energy sector through more than 365 projects or companies. ■



View of EDF's West Burton B combined-cycle power station

Wärtsilä converts Bel-Air peaking power plant in Dakar to run on LNG

Senelec, Senegal's state utility, has awarded an EPC contract to Wärtsilä to convert the Bel-Air power plant in Dakar to operate on liquefied natural gas (LNG). Currently, the 90 MW fast-start plant is running on heavy fuel oil (HFO). The project will be the first ever power plant gas conversion in Senegal.

As per the engineering, procurement, and construction (EPC) contract, Wärtsilä will manage all phases of the project, which is due completed before the end of 2021.

The contract, booked in the first quarter of this year, stipulates that the existing six Wärtsilä 46 engines at the Bel-Air power plant will be converted to six 50DF dual-fuel engines. The current operation & maintenance agreement is being renegotiated in view of this conversion.

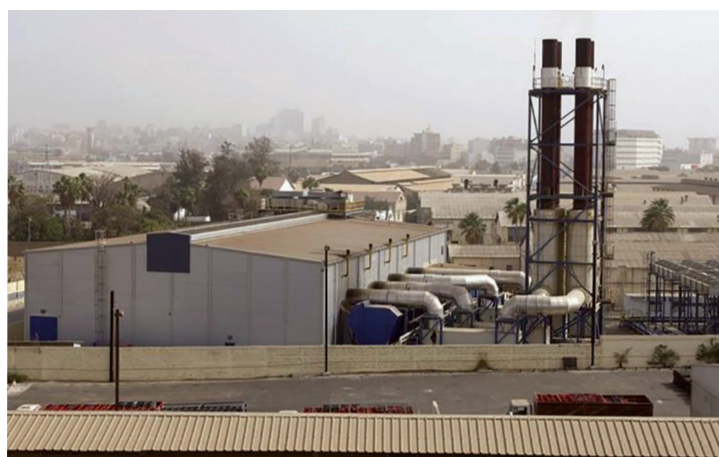
Once running on 50DF dual-fuel engines, Senelec will be able to burn multiple fuels at its Bel-Air power plant. The cheapest option would be to run the plan on natural gas with liquid fuels as back-up. Apart from the engine conversion, Wärtilä will also check the plant's operational safety with control functions, mechanical auxiliary systems, as well as electrical and automation systems being

changed or upgraded as required.

Commenting on the project, Senelec's managing director Papa Mademba Biteye said: „Our two main aims were to improve the plant's environmental profile and to lower the operating costs. By taking advantage of Wärtsilä's deep experience and strong capabilities in power plant gas conversions, we can achieve both of these goals. At the same time, we are preparing the plant for the country's future gas supply infrastructure."

Senelec also has three other Wärtsilä

power plants in operation in Senegal in addition to the Bel-Air unit. In total, the Finish equipment manufacturer has around 4,792 MW of flexible power generation capacity installed in West Africa. ■



The Bel-Air power unit will start running on LNG before year-end

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