



Hydrogen plants in South Australia become profitable this summer

South Australia has the wind and sunshine to evolve into a prime hydrogen supplier. According to Cornwall Insight, a hydrogen plant could make a profit of a \$2.3 million this summer, assuming 20% utilisation and quarterly repayment on the \$593 million of government debt with interest, operating costs, and net cost of energy.

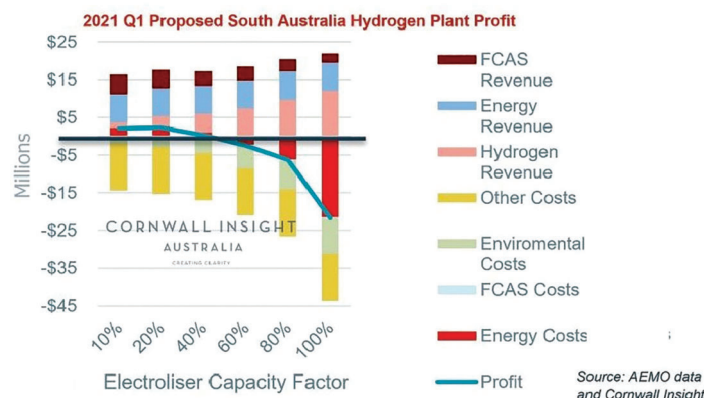
“If the plant was available in summer 2020, it could have made around \$47 million in profit – a stark difference compared with a \$2.3 million loss in the first quarter of 2019,” said Benjamin Macey, senior storage consultant at Cornwall Insight Australia.

For the modelling, Cornwall Insight assumed the hydrogen will be sold at around \$2 per kilogram, which is in line with the pricing under Australian government's Technology Investment Road Map.

SA Labour Party supports hydrogen production and storage

The South Australian Labour Party has committed to building a hydrogen production, storage and electricity generation facility if elected at the next SA State election. Their proposal includes a \$220 million 250MWe electrolyser, \$31 million for 3,600 tonnes of liquefied hydrogen storage and \$342 million for a 200 MW combined-cycle power station.

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Bloom Energy deploys first fuel cells, powered solely by hydrogen

California-based Bloom Energy, together with its Korean partner SK Engineering & Construction, has deployed 100 kilowatts of solid-oxide fuel cells (SOFC) powered solely by hydrogen for a pilot plant in the city of Ulsan. Bloom entered the hydrogen market in July 2020, which includes a 1 MW hydrogen-fuelled Energy Server with SK E&C due operational in 2022.

Hydrogen fuel cells convert hydrogen into electricity through electrolysis – a non-combustion electrochemical process – which is increasingly recognized by governments across the globe as an essential tool for full decarbonisation. Bloom's SOFCs use hydrogen as a byproduct, generated by SK Advanced, to create emission-free electricity.

Upon completion of the pilot project, the SOFCs will support South Korea's Changwon RE100 initiative, as well potentially many other projects worldwide.



Bloom's SOFC, powered solely by hydrogen, will be used in the Ulsan pilot project

RE100 is led by the non-profit organisation Climate Group and aims to accelerate the switch

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"If such a plant were in operation at the stated capital costs, it could be profitable," Macey said. In addition to the 20% utilisation factor, approximately 1,517 tonnes of hydrogen would have been effectively produced, which could have been stored or used for emission-free power generation.

"Financing arrangements, using government debt, make the project viable," he ex-

plained, hence "it would be difficult to finance on a commercial basis without a clear offtake market and incentive to invest." In addition, the political value for the South Australian government value in terms of job creation, economic growth and supporting the transition to cleaner fuels is not being considered within the limits of a commercial business case.

"If Australia is to compete globally in hydrogen exports, governments will need to assist the industry and be a first mover. Similarities can be made to the support government has given to battery storage," Macey stressed. Cornwall Insight estimates there is now over 1 GW of battery projects proposed in South Australia with at least seven virtual power plants in operation. ■

Debt issued by US upstream companies hits fresh record in March

The amounts of debt and equity issued by US exploration and production (E&P) companies have surged to \$4.4 billion in March 2021, the highest level since last August. The reason for this, according to the EIA, is because upstream players want to cash in on higher oil prices, which bounced back from less than \$40/bbl in spring 2020 to currently over \$65/bbl.

"Ever since crude oil prices began increasing, U.S. crude oil producers have been raising debt and equity to refinance debts, resume drilling activities, or purchase acreage," analysts from the US Energy Information Administration (EIA) commented.

Today's low interest rates have reduced the cost of debt which has been another stark trigger for the recent growth from E&P firms issuing debt and equity. The Federal Reserve System's Federal Open Market Committee has held the federal funds rate, which affects interest rates across the market, at a target of 0.00% to 0.25% since March 2020.

Bond yields at multi-year lows

Corporate bond yields have also been low in the United States, contributing to lower in-

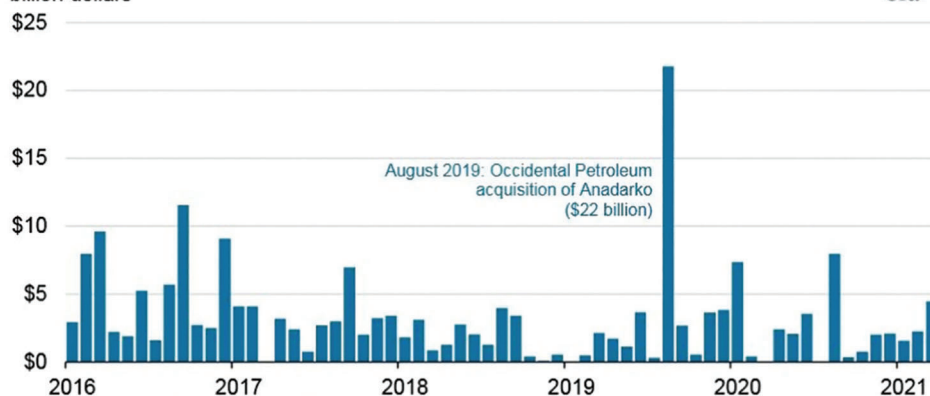
terest rates on new bonds that companies issue and reducing the cost of issuing debt. For example, the Moody's seasoned AAA corporate bond yield – a measure for the average bond yields for investment grade companies – averaged 2.70% in February, which is lower than the 2011–20 average of 3.78%.

"Bonds yields, specific to energy sector companies with a rating lower than investment grade, seen trading at multi-year

lows," EIA analysts pointed out.

"Because U.S. producers have increased access to debt and equity, we forecast that US crude oil production will increase from 10.7 million barrels per day (b/d) in first-quarter 2021 to 12.2 million b/d in fourth-quarter 2022," they said, stressing this trend will also push up associated gas production and shale gas output from wells with a high concentration oil liquids. ■

Debt and equity issued by U.S. exploration and production companies, by month
billion dollars



Source: U.S. Energy Information Administration, based on Evaluate Energy
Note: Analysis includes only publicly traded U.S. exploration and production companies.

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toward zero-carbon electricity. In November 2020, Bloom Energy and SK E&C won a competitive bid Changwon RE100 to deliver and supply Bloom Energy's hydrogen-powered SOFCs and hydrogen electrolyzers to an industrial complex near the port city of Ulsan, South Korea.

Jason Ahn, CEO of SK E&C said Bloom's

hydrogen fuel cells will allow the Korean construction company to provide clean electricity that will help Korea reach carbon neutrality by 2050. "We look forward to playing a leading role in the SK Group's eco-friendly business expansion, as well as the Korean government's Green New Deal and carbon neutrality policy," he said. ■

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Uniper plans hydrogen hub at Wilhelmshaven, instead of LNG terminal

German utility company Uniper is looking to import hydrogen, instead of LNG, at the port of Wilhelmshaven. The terminal is planned to be equipped with an ammonia cracker for producing green hydrogen and a 410 MW electrolysis plant, which – combined with the imports – is meant to cover 10% of Germany's hydrogen demand in 2030.

Under the name "Green Wilhelmshaven," Uniper plans to establish a national hub for hydrogen, and a feasibility study of this endeavour is currently underway. The proposed hydrogen hub would be capable of supplying around 295,000 metric tons by the end of the decade.

Most of the green hydrogen will be supplied to local industry in northern Germany, with the remainder to be fed into the national gas grid. Ultimately, the government is seeking to realise a national hydrogen network in a bid to broaden the usage of this green fuel.

First scaled hydrogen production plant

The NH₃ splitting plant for producing green hydrogen would be the first scaled plant of



Site of the future 'Green Wilhelmshaven hub'

its kind. Commissioning of the new terminal is planned for the second half of this decade, meaning in 2026 at the earliest.

Originally, Uniper intended to build a floating LNG import terminal at Wilhelmshaven but an open season, held in October 2020, showed there is currently not enough interest in the LNG sector in terms of booking large, long-term capacities for LNG regasification in Germany.

Hydrogen 'vital' to decarbonise steel industry

If Germany and Europe want to remain "industrial powerhouses" and still hit its climate targets, green fuels like hydrogen are needed to power sectors such as steel production, the chemicals industry or in freight, shipping and air transport.

Steel production, in particular, is a sector in which hydrogen can play a crucial role in reducing CO₂ emissions. "Currently, each metric ton of crude steel produced releases approximately one metric ton of CO₂ emissions," explained Dr. Axel Wietfeld, CEO of Uniper's Hydrogen business unit. "Hydrogen is the only realistic option for decarbonising this industry," he stressed.

David Bryson, Uniper Chief Operating Officer (COO) agreed: "We need 'green molecules' as well as 'green electrons'. We

need to get hydrogen out of the laboratory and start using it in large-scale applications and marketable industrial solutions — we should make it into a commodity and exploit its wide variety of uses," he underlined, adding; "One way of achieving this is to import green ammonia and convert it into hydrogen, which is something we are looking at for Wilhelmshaven."

Plans for 14 TWh of green hydrogen in 2030

Currently, Germany plans to generate 14 TWh of green hydrogen in 2030, but the demand for that year is forecast to be 90–100 TWh. To bridge that gap, Germany will heavily depend on import – if it wants to turn its hydrogen policies into reality.

In addition, Uniper and its partners are looking to ascertain whether it would be feasible to build a direct reduction plant with upstream hydrogen electrolysis on the site of the existing power plant in Wilhelmshaven, as well as the required infrastructure for supplying raw materials. The aim is to produce around 2 million metric tons of "green" crude iron using hydrogen generated via wind power. Uniper is working with Salzgitter and Rhenus Logistics, the city of Wilhelmshaven and the state of Lower Saxony on this project. ■

MHI joins team of 12 companies in Hamburg Hydrogen Network

Mitsubishi Heavy Industries (MHI), Shell, Vattenfall and Wärme Hamburg – the founding four of Hamburg's Green Hydrogen Hub – have teamed up with Airbus and ArcelorMittal and another six firms to form the 'Hamburg Hydrogen Network'. As of 2026, the partners aim to curb CO₂ emissions in Hamburg by 170,000 tons each year.

Thanks to local electrolysis, sea-side imports and connection to the emerging European hydrogen network, the Hamburg Hydrogen Network aims to rival traditional electric utilities. Green hydrogen, produced in Hamburg, would replace fossil fuels in industrial production as well as in the transport and logistics sector.

Utilization of the waste heat from the electrolysis for the district heating network and the thermal treatment of municipal waste would reduce the environmental footprint of a variety of industries even further.

Converting coal power plant to hydrogen

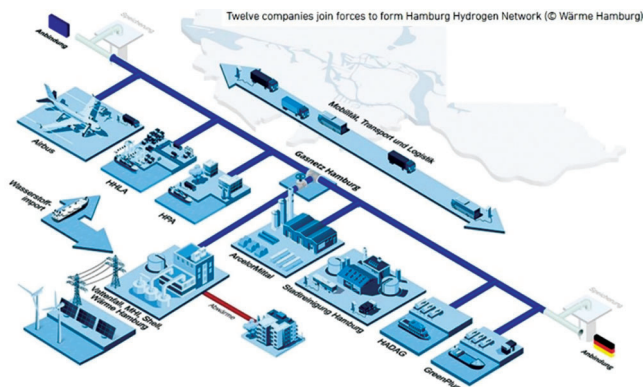
The planned conversion of a coal power plant in Hamburg-Moorburg into a scalable 100-MW electrolysis plant for the production

of green hydrogen from renewable energy, is seen as the foundation for building a complete hydrogen value chain in Hamburg.

The Port of Hamburg, with its wide network of potential industrial applications and service partners, offers a unique location-specific advantage to creating a viable hydrogen economy.

Positive spill-over effects across Europe

Looking ahead, project developer hope the network should produce a variety of positive spill-over effects throughout Germany and across Europe. It is already closely linked



with Germany's northern neighbours, Denmark and the Netherlands.

Cross-border sale hydrogen through the European gas grid will be vital for creating a 'hydrogen economy' that harnesses surplus energy from offshore wind and solar PV installations. ■

UK forward power price for May seen trade twice as high as last year

UK power prices have risen considerably above summer 2020 lows. Industry demand rebounded once Covid-19 lockdowns were lifted, which together with a bullish gas market will likely keep the May 2021 baseload power contract at £60/MWh – twice the value of the May 2020 contract this time last year.

Cornwall Insight observed UK energy demand has "more or less recovered to the level seen before Covid-19 impacts took hold." According to analyst Sam Peak, "this should mean that power prices stay above the consistent sub £20/MWh lows of last summer."

Additionally, power prices are being held at higher levels through a combination of high carbon prices and a relatively bullish gas market, with European gas stocks at

very low levels for this time of year.

Demand uncertainty persists

On the flip side, there remains the uncertainty on future infection rates and Covid-19 containment measures, and their impacts

on the wholesale gas and electricity market.

National Grid ESO, for example, has reinstated its Optional Downward Flexibility Management (ODFM) service for summer 2021 in case of exceptionally low demand periods. Whilst nothing is certain for power and gas markets, Cornwall Insight shares a broadly similar view to National Grid on the potential trajectory of the market over the next six months.

"Electricity demand is now far more likely to follow more "normal" patterns of 2019 as we further emerge from the existing nationwide lockdown restrictions," Peak said. "However, another demand shock or a change in the trajectory of commodity markets could still change this picture." ■



US gas consumption to fall through 2022 amid sluggish economy

The US economy has been badly hit by the Covid-19 pandemic, pushing down natural gas consumption in 2020 to levels of 1.9 Bcf per day lower than 2019-highs of 85.1 Bcf/d. Government analysts expect gas demand for power generation will continue to fall in 2021 and 2022 amid greater renewable energy built-out.

According to the EIA's April Short-Term Energy Outlook (STEO), the electric power will be the only sector that will consume less natural gas in 2021, after having been the only sector to increase gas-burn in 2020.

Prices for natural gas were historically low in 2019 and 2020, making cleaner-burning gas even more competitive with coal for generating electricity.

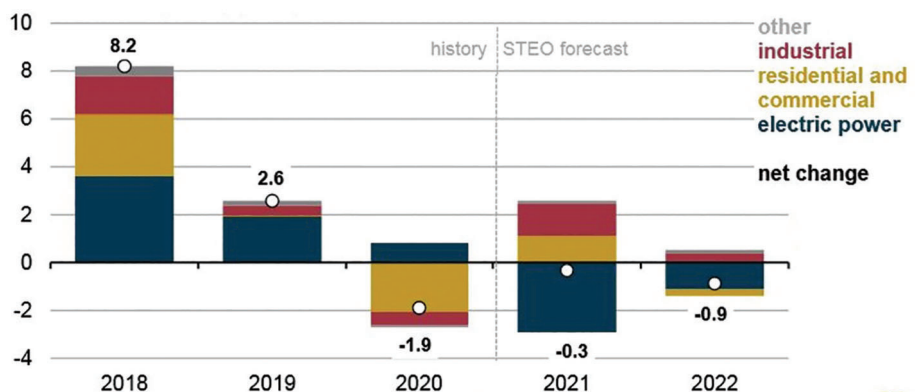
Rising gas prices to trigger fuel switch

Going forward, however, gas prices are forecast to rise and more renewable capacity will come online in 2021 and 2022. Hence, EIA analysts expect a change in the fuel mix with more electricity generation coming from coal and renewables and less from natural gas.

At the height of the pandemic in 2020, residential and commercial gas consumption fell by a combined 2.1 Bcf/d from 2019-levels as lockdowns curtailed economic output but also due to unseasonably warmer weather. There were 9% fewer heating degree days (HDDs) in 2020 than in 2019 which substantially reduced gas demand for space heating.

Based on forecasts by the National Oceanic and Atmospheric Administration, analysts expect heating demand (measured in HDDs) will rise 5% in 2021 and 1% in

U.S. natural gas consumption by sector, net change from previous year (2018–2022)
billion cubic feet per day (Bcf/d)



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook* (STEO)
Note: Industrial consumption includes lease and plant fuel.



2022. As a consequence, residential and commercial natural gas consumption are forecast to rebound over the course of this year, but then fall slightly in 2022.

Demand rebound short-lived, easing off in 2022

In the STEO forecast, industrial gas consumption is seen rise in 2021 and 2022 after falling by 0.6 Bcf/d in 2020. Though also impacted by heating demand, industrial gas use is more affected by economic trends.

As a result of a weaker economy during the COVID-19 pandemic, industrial activity in

April 2020, as measured by STEO's natural gas-weighted industrial consumption index, was at its lowest level since the 2009 financial crisis. This index reflects the growth of manufacturing subsectors and their relative importance to total natural gas consumption.

"We expect that the index will exceed 2019 levels on an annual basis in 2021 and 2022 as businesses resume operations," EIA analysts said, concluding: "We increased the natural gas-weighted industrial consumption index in 2021 and 2022 in our forecast to reflect expectations for economic activity based on IHS Markit forecasts." ■

Vires gets notice to proceed with LNG-to-Power project at Batangas

Philippines' Department of Energy has given notice to proceed (NTP) to Vires Energy's proposed floating LNG import unit and integrated power generation unit at Batangas Bay. The permit is valid for six month during which time Vires needs to submit proof of financing to the regulator.

Vires' proposed a Floating Storage and Regasification Unit (FSRU) has approximately 162,400 cubic meters of storage capacity, and will be located 1.6-kilometers from the south-eastern coastline of Batangas Bay in Barangay Simlong.

Keppel-built 'BW Paris' picked as FSRU vessel

The FSRU is a converted LNG Tanker, named 'BW Paris' that has been built in 2009 with a regasification capacity of up to 3 million tons per annum (mtpa). The carrier had been converted at the Keppel shipyard in Singapore and has a nominal regasification rate of 550 million metric standard cubic

feet (mmcf) of natural gas per day.

Vires Energy's integrated LNG regas and power gen project will also include a 1.6 subsea gas pipeline to transport the fuel from the FSRU to the 500 MW power station, which will be mounted on a barge.

Targeted to be built and commissioned by January 2023, the floating power plant will be the largest units of its kind in the Philippines and will help cover the energy needs of the heavy industrialised regions around Batangas Bay.

First Gen develops rival FSRU project on Batangas

Manila-listed First Gen has been fast-tracking a floating storage and regas unit (FSRU)

to ensure continuous fuel supply for 3.2 Gigawatt (GW) gas-fired power gen capacity near Batangas City. The aim is to receive the first LNG cargo in the autumn of 2022.

For First Gen, one of the largest power providers in the Philippines, the timely start up of the FSRU is crucial to ensure the continued operations of

the Philippines' gas-fired power units. The imported regasified LNG will substitute depleting domestic gas supply for several the nearby power stations, notably Santa Rita (1,000 MW), San Lorenzo (500 MW), San Gabriel (414 MW) and Avion (97 MW).

All four power stations currently run on gas from the Malampaya field northwest Palawan, operated by a Shell-led consortium. Supply contracts with the Philippine government for domestically produced gas will expire by 2024.

Shell advances FSRU at Tabangao

The Anglo-Dutch oil major Shell is also planning to deploy a leased FSRU at Tabangao, Batangas, with the aim of importing LNG to the Philippines. Notice to Proceed for the project was given by the Department of Energy on March 16 – a good ten days before Vires Energy was given the same NTP permit.

"The Philippines is an important country for Shell and [we are] keen to continue working with the country to meet its growing energy requirements," a Shell spokesperson said.

While striving to import LNG to the Southeast Asian nation, Shell is simultaneously trying to divest its 45% operated stake in the large but fast-depleting Malampaya offshore gas field. ■



The FSRU carrier 'BW Paris' will serve First Gen's Batangas LNG project

Punjab LNG-to-Power project (1.2 GW) reaches financial close

Punjab Thermal Power's 1,263 MW LNG-fuelled project near Trimmu Barrage, Jangh district,, has reached financial close. Total project cost is estimated at \$708 million, financed through 75% commercial debt from National Bank of Pakistan, Bank of Punjab, United Bank and Habib Bank.

The integrated LNG-to-Power project is being developed by PTPL, a private company owned by the government of Punjab.

Works over 80% completed

The combined-cycle gas power plant will have an efficiency of 61.16% – among the highest in the world. Construction work has been 80% completed, the government of Punjab said without giving details about the planned commissioning and start-up date.

Once up and running, the CCGT it will help in stabilising and balancing the transmission system to ensure uninterrupted supply to Faisalabad and adjacent areas.

The project is expected to generate over 3,000 jobs during construction and nearly 2,000 during its operation.

Fourth mega project in the region

The Punjab project near Trimmu Barrage is the fourth mega project in the region, with the first being the 1,180 MW Bhikki power station which is running commercially successfully since mid-2018. Operated by Quaid-e-Azam Thermal Power Private Ltd (QATPL), owned by the government of Punjab, the combined-cycle plant has been built by Harbin



Electric International (HEI) and GE Power.

GE-made HA turbines also drive the Haveli Bahadur Shah (HBS) and Balloki power plants, which together with the Bhikki plant add a total of up to 3,600 MW to Pakistan's grid. ■



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Siemens Energy aims for PEM electrolyser to reach 1 GW by 2020

Christian Bruch, Siemens Energy CEO has underlined the role of hydrogen in decarbonising industry and vowed the company will scale up its proton exchange membrane (PEM) electrolyser to 1 GW by 2030. Together with Air Liquide, Siemens is developing an industrial-scale electrolyser that will be piloted at the 200 MW green hydrogen project, H2V Normandy.

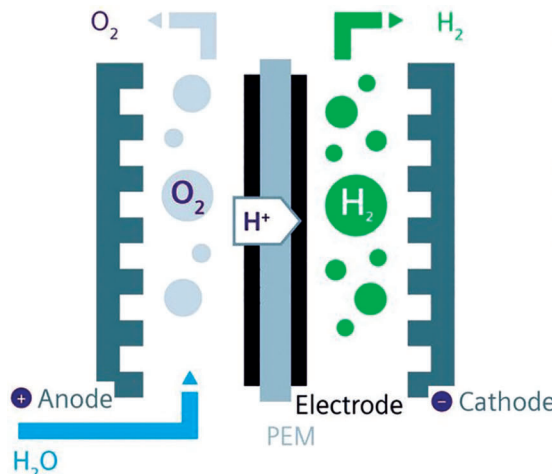
In the framework of their cooperation for the H2V Normandy project, the Franco-German team applied for funding under the EU's Green Deal and Important Project of Common European Interest (IPCEI)-scheme for hydrogen.

Low cost, versatile energy carrier

Hydrogen is a versatile energy carrier and can be produced sustainably and at a lower cost through large-scale PEM electrolysers. It can be used as a zero carbon fuel, energy storage media, industrial feedstock, as well as the basis for all kinds of e-fuels. These green fuels can not only be used in industry or for power generation, but also in transport, buildings and agriculture.

"These benefits position hydrogen as a central vector, capable of connecting all carbon emitting sectors," Bruch pointed out, suggesting the novel fuel will "shape and accelerate the transition into a carbon free energy society and economy."

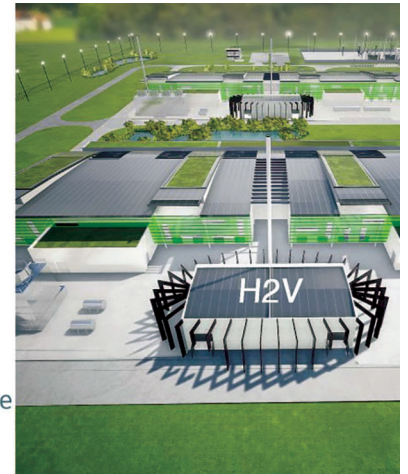
Today, 75 million tons of grey hydrogen is produced from methane today, where 9 to 10 tons of methane is emitted. In the future, a



greater share of hydrogen is meant to be produced from renewable energy sources, or from natural gas while abating emissions through carbon capture and storage (CCS).

Time to invest in new value chains

Under the 'France Reliance' scheme, over €7 billion will be invested in hydrogen between now and 2030 to make the economy more competitive and more decarbonised. "now,



is the time to invest massively in order to develop new value chains and new technologies. Now, is the time to act," the French economy minister, Bruno Le Maire stressed.

The project of Air Liquide and Siemens Energy, in his view is "only the beginning of an industrial cooperation that must develop beyond a Franco-German alliance. The recovery must be above all a European recovery."

Rolls-Royce launches cybersecurity network focused on propulsion

Rolls-Royce has set up a research network with Purdue and Carnegie Mellon University to enhance product security of propulsion and power systems. The first research project is already underway and looks at the use of Artificial Intelligence (AI) for intrusion detection in resource-limited embedded systems.

In the engineering of electric turbines and engines, similar to other advanced technology, the lines between cyber and physical are being blurred as manufacturing, critical infrastructure and commercial systems all are increasingly inter-connected.

Artificial intelligence has become one of the most effective methods to detect undesired or anomalous behaviors within systems, but traditional AI requires substantial computing resources. Rolls-Royce said its new research is hence "focused on developing AI approaches that can be utilized in

resource-constrained embedded systems that are prevalent in many of our products."

Underlining the need to be vigilant and proactive in identifying and defending against cyber threats, Neil Cassidy, Rolls-Royce, Chief Information Security Officer (CISO), explained: "This new network with these leading universities will ensure we are focusing on the most vital research areas and constantly evolving to meet ever-changing threats."

Researchers at Purdue University, in West Lafayette, Indiana, and Carnegie Mellon University, in Pittsburgh, Pennsylvania, are expected to conduct two to three projects with each school per year. The research is funded by Rolls-Royce.

Three major projects have already commenced, and the universities prepare to launch additional projects expected later in the year.



Marubeni and Kansai Electric transform Sanda into a "Smart City"

Japanese manufacturer Marubeni and Kansai Electric have entered an agreement to promote the "Sanda Satoyama Smart City" – a digitally transformed new urban development designed to "shift the flow of people in the post-corona era." Electrification of transport along with digital offices for remote working are meant to improve people's quality of life.

Sanda-City, situated in Japan's Hyōgo Prefecture, is home to about 112,000 inhabitants. The area is made up of several farm villages as well as some urban areas and new towns – all with different characteristics and energy needs.

By partnering with Kansai Electric, one of Japan's main power providers, Marubeni wants to get involved in the planning and management of a wide range of new urban projects. The focus hereby lies on mobility, community activities, healthcare, agriculture, the environment, disaster prevention and safety via a newly-established GIGA School.

Mitsubishi wins turbine order for 1,500 MW CCGT in Uzbekistan

Mitsubishi Power, part of MHI Group, has won an order for two M701JAC gas turbines to be installed at the 1,500 MW combined-cycle gas power station, under construction in the Uzbek town of Sirdarya. The order is based on an equipment supply deal with the project's lead developer AWCA Power and ECP contractor China Gezhouba Group.

The M701JAC gas turbine is Mitsubishi's latest model in its J-Series of gas turbines, featuring a forced-air-cooled combustor system and an optimized cooling structure. They also have an extra-thick-film thermal barrier coating that enables more advanced cooling of turbine blades, and they adopt a compressor with a high pressure ratio.

Shifting from coal to gas generation

Built at a cost of \$1.2 billion, the 1,500 MW Sirdarya CCGT is designed to meet 15% of Uzbekistan's electricity needs and will account for 8% installed capacity. The high efficiency gas-fired unit will allow the plant operator to partially close the existing Sirdarya coal-fired power units, which is expected to reduce CO₂ emissions by 2.2 million tons per year.

On April 6, Saudi Arabia's ACWA Power

has secured \$750 million in senior debt to develop the Sirdarya gas power project. "Considering the current macroeconomic climate, the closure of a public-private partnership (PPP) for the Sirdarya project highlights ACWA Power's ability to arrange structured finance agreements," commented the company's Chief Investment Officer (CIO), Rajit Nanda.

The Sirdarya CCGT has been backed and partially funded by the Government of Uzbekistan to provide cleaner, more efficient and cost-competitive electricity for the country's energy-intensive industries. Once operational, the CCGT's installed capacity account for 8% of Uzbekistan's total electricity generation capability and will be able to meet 15% of the country's overall power demand.

ACWA Power, a leading Saudi developer, investor and operator of power and water



Mitsubishi's M701JAC gas turbine

desalination assets, has been designing and delivering the three projects in Uzbekistan: the Sirdarya CCGT and two wind farms. Works are based on a contract with the Uzbek energy ministry which is taking steps to meet the country's rising electricity demand, forecast to reach 110 billion kWh by 2030. ■

German TSO Amprion installs two STATCOMs to stabilize the grid

German transmission system operator Amprion has asked Siemens Energy to build two SVC PLUS series static synchronous compensator (STATCOM) systems in Polsum, North Rhine-Westphalia (NRW), and Rheingau, Baden-Württemberg. Both systems have a reactive power range of +/- 600 Mvar, making them some of the most powerful systems in the world.

STATCOMs' grid-supporting control mechanisms allow the units to compensate for growing voltage fluctuations as Germany's renewable build-out progresses. The volatile feed-in of wind and solar power sources put significant strain on the power grids worldwide.

Owing to geography, renewables are often located far away from the centres of energy use. In Germany, for example, large wind farms are situated in the North while load centers are in the centre or southern parts of the country. This makes the transmission network more susceptible to voltage fluctuations and interference.

Lack of reactive power

Large thermal power plants used to provide the reactive power necessary for grid stabilization. However, many nuclear or coal-fired power plants are being taken off the grid as Germany's energy transition progresses.

As a result, TSOs like Amprion need to retrofit the grid with static synchronous



View of a STATCOM system in Kriftel, Hesse, installed on behalf of Amprion

compensator like STATCOM. These systems compensate for the voltage fluctuations by regulating the reactive power as required, keeping the grid voltage in a stable range.

Moreover, the rise of renewable energy generation makes it necessary to expand the power transmission grid which also reinforces the need for more reactive power compensation. In combination, this requires STATCOM systems with increasing capacities up to +/- 600 Mvar reactive power, engineers at Siemens Energy argue. ■

GE services Sonagas' Ubungo plant in Tanzania

General Electric has completed works at four LM6000 aeroderivative gas turbines at Sonagas' Ubungo power plant in Dar-es-Salaam, Tanzania. The plant had been on outage during servicing and routine parts replacement, but now continues to deliver up to 150 MW of electricity to the grid.

The Ubungo power plant provides nearly 12% of the grid connected power in Tanzania. The gas turbines are equipped with SPRINT (SPRAYINTERcooling) technology. 'According to GE, this increases gas turbine performance, improves power flexibility, enhances the combustion system, improves fuel efficiency, extends maintenance intervals for the combustor, hot section and major overhaul and lowers maintenance costs.

Engineers from FieldCore, GE's owned field services company, worked in collaboration with Sonagas under a established Covid-19 site protocols to ensure the safe completion of the project. ■



Ubungo power plant in Dar-es-Salaam

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