

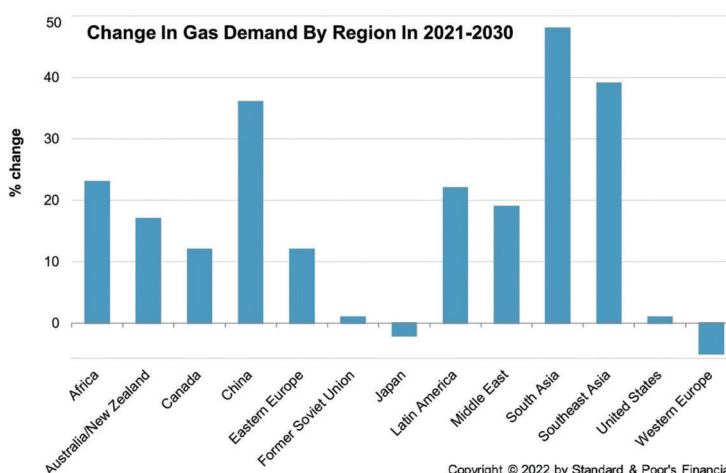


Weekly News

19 August 2022

S&P Platts sees Europe's gas demand fall amid shift to greener fuels

Europe's rapid shift to renewables and greener gases could make the latter account for 20% of EU gas demand by 2030 as per the bloc's REPowerEU targets, S&P Global Platts reckons. Globally, demand is seen rise through 2030, though China's turn to cheaper coal and nuclear power generation will reduce gas to just 9% of the country's primary energy mix.



Gas-burn for power generation may be the area where demand softens most, analysts noted. By contrast, the use of gas as a raw material in chemical production will be difficult to substitute. The industrial sector represents almost 40% of gas demand globally, with the power sector accounting for 36% of global gas use. The US gas price is increasingly influenced by global gas dynamics, not least the Ukraine war and Gazprom's subsequent reductions in contractual pipeline gas deliveries to Europe.

Limits to US coal-to-gas switch

Prices at the US bellwether Henry Hub has soared to \$9 per million cubic feet – broadly comparable to \$9/mmBtu – from historical averages of \$2/mcf-\$3/mcf, as more feed gas is routed to liquefaction plants for export to Europe. However, the re-

cent increase in natural gas prices is, in the first instance, because gas-to-coal switching is not happening in many regions.

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Aramco splashes out on CCS from 2026, aims to export hydrogen

Saudi Aramco plans to start capturing and permanently storing carbon dioxide from 2026, in what will be the one of the largest CCS facilities of its kind as the state oil & gas giant aims for net-zero emissions by 2050. The first phase of the project, near Jubail industrial city, will store up to 9 million tons of CO₂ per year.

At this size, Phase-1 alone will be able to store the equivalent of emissions from up to 2 million gasoline-guzzling passenger cars driven over one year. The CCS project is being implemented as part of Aramco's vision to produce hydrogen from natural gas – which requires carbon capture and storage on a massive scale to produce the hydrogen in a sustainable manner.

Converting natural gas, or methane (CH₄), into hydrogen (H₂), emits carbon dioxide (CO₂) – a polluting substance that adds to global warming. However, the CO₂ can be trapped and permanently stored, e.g. in depleted oil fields.



Aramco sent its first shipment of blue ammonia in Sept 2021 to Japan

Combined, this process leads results to what is known as blue hydrogen – H₂ produced from natural gas using CCS.

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Switching from coal-to gas-fired generation used to be utilities preferred strategy to help ease natural gas prices. Coal prices, on the other hand, have also escalated due to limited coal operations; inventories are low and S&P Platts says it sees no new coal-related investments. "We ultimately expect to see U.S. gas exploration and production companies increase supply, but in a measured way," analysts commented.

US demand growth for natural gas for

generation electricity is stabilising – contrary to developments in China. Analysts expect gas to represent 30% of the US's primary energy mix by the end of the decade.

Coal, nuclear cheaper in China than LNG

"In China, locally procured coal and locally built nuclear power plants have a competitive advantage over imported gas, since se-

curity of supply remains a priority, and gas often comes in the form of imported LNG which is a more expensive fuel source," analysts concluded.

Despite China's growing hunger for energy, the price disadvantage of imported gas versus locally sourced coal and nuclear means that gas-burn for power generation will account for 9% or at most 10% of the country's primary energy mix by 2030, compared with 30% for the U.S. ■

Denham Capital helps Nexif to divest energy assets to RATCH Group

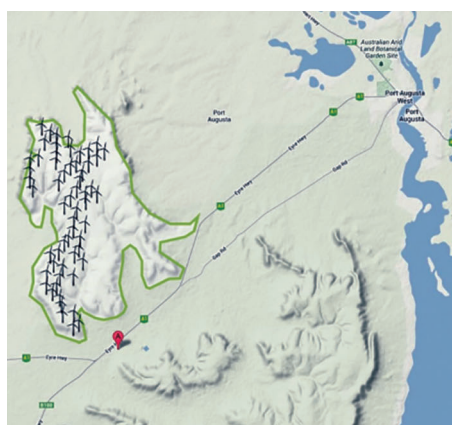
Denham Capital, a global investment firm, and Singapore-based Nexif Energy have jointly arranged and agreed to sell the latter's energy assets in Australia and Southeast Asia, where Nexif owns 2,670 MW of power gen capacity. These assets, with an enterprise value over US\$1 billion, will be sold to Thailand's RATCH Group at a transaction equity value of US\$605 million.

Nexif, a Singaporean renewables focused power development and investment company, founded Nexif Energy in August 2015 together with Denham Capital. The aim was to acquire, develop, construct and operate clean energy assets and battery storage across Australia and Southeast Asia.

Hybrid gensets combined with energy storage

Following this strategy, Nexif Energy combined wind, solar and gas-fired thermal generation into hybrid power sources, and fitted them with energy storage. For example, Nexif's Lincoln Gap wind farm in South Australia comprises 212 MW of wind turbines and 10 MW of battery storage. In Vietnam, the company developed clean and reliable hydropower projects, solar projects in the Philippines, and a 98 MW combined-cycle gas power project in Thailand.

All in all, Nexif Energy gradually built a portfolio with a total capacity of nearly 2,700 MW. Of this, nearly 500 MW is currently operational or under-construction, increasing to



Map and view of Nexif's Lincoln Gap wind farm in Australia

about 1,300 MW operational or under-construction by 2023, and a further 1,400 MW at various stages of development.

The sale comprises over 80 assets and over 7,500 MW across the US, Europe, Australia, and select non-OECD markets. Denham had worked hand in hand with Nexif and its team to develop energy and critical power generation and battery storage assets but the partners ultimately decided to dispose of these assets in Australia and Asia.

Second exit in Australia and the Philippines

"This sale represents our second successful exit in both Australia and the Philippines.

With its unique approach to hybrid power solutions, sizeable wind and gas projects in South Australia, hydropower projects in Vietnam and solar farms in the Philippines, Nexif Energy is perfectly positioned for its next phase of expansion, under the Nexif-RATCH partnership," commented Denham Capital managing director Saurabh Anand.

Nexif founder and executive chairman, Surender Singh added: "We started this journey of Nexif Energy to develop and acquire renewable energy focused power generation portfolio across Southeast Asia and Australia in August 2015 in partnership with Denham Capital. I am proud to have delivered a successful business and solid returns." ■

Gas to Power Journal

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The hydrogen, in turn, can be compressed or cooled and then shipped from Saudi Arabia to markets like Europe, North America or North Asia for use as a fuel for power generation, transport and the chemical industry. Alternatively, the H2 can be converted into ammonia – another carbon-free fuel.

The strategy of Aramco is to show that "on a life-cycle 'well to gate' basis we have one of the lowest carbon-intensity ammonia

available for export to the various markets — whether it's for chemical, fertilizer or energy purposes," said Oliver Thorel, Aramco's vice president of chemicals. "I think it's a way for us to properly get credit for the investment we've made to manage CO2 in a well-integrated way — but that's not the end game," he said told reporters. "The end game is to invest in a dedicated facility for carbon sequestration." ■

German gov' imposes gas price surcharge to support importers

The German government has decided to compensate gas importers, for having to procure more costly alternative supplies like LNG in the face of Russia cutting short contractual deliveries, through the introduction of a surcharge. All gas consumers will have to pay the surcharge from 1 October 2022 until 1 April 2024, and the actual amount has been pegged at 2.4 cent per kilowatt-hour.

Consumer groups and energy-intensive industry opposes the move, even though it is not clear yet how high the actual surcharge will be as this will depend on how many claims are made and for how much. The decisive factor will be what happens with Russian gas supplies, the government stressed, noting: "a surcharge of between 1.5 and 5 cents per kilowatt hour can be assumed for all gas consumers in Germany." The final amount of the surcharge will be invoiced on monthly basis and can be adjusted every three months.

Since mid-June, Russian state-run Gazprom repeatedly cut gas imports to Germany, and importers are often unable to pass on the additional costs to their cus-

tomers due to contractual provisions which results in considerable losses. Affected companies are only be able to absorb these losses for a limited period – then they need support, like Uniper, or face bankruptcy.

Importers will bear 10% of the costs

Trying to appease critics, the government stressed it is not yet at this point in time how much gas end-customers will have to pay for the surcharge as this will depend on how many importers will make financial compensation claims and how high they are.

"The temporary surcharge is a result of the crisis caused by Russia (...) it is necessary in order to secure the heat and energy supply both for domestic consumption and



for the economy," said Robert Habeck, federal economic and climate minister.

"The costs will be distributed as fairly as possible: until October, the gas importers affected will bear all the costs for procuring alternative supplies on their own. After that, the costs will be shared evenly among many stakeholders," he explained, stressing: "For as long as the surcharge remains in force, the respective gas importers will bear 10% of the costs themselves." ■

Norway pledges to deliver "maximum possible" gas

As fears grow of a gas gap and spiralling prices in Germany, the Norwegian Prime Minister Jonas Gahr Store promised the country would be delivering "the maximum of what we can." Olaf Scholz, the German Chancellor expressed his gratitude and promised the two countries would also deepen their clean energy cooperation, in including offshore wind power, solar energy, hydrogen and carbon capture and storage (CCS).

The share of Norwegian gas supply to Germany has been growing rapidly to over 30% market share since the beginning of Russia's invasion into Ukraine. Deliveries between January and April doubled to 15 billion cubic metres over the same period one year before – the highest export value to the EU ever recorded.

Norway's state-owned energy company Equinor is enjoying windfall profits from the surge in European gas imports. In the second quarter of this year, profits grew by nearly €2 billion euros to €6.6 billion.

Though exports of Norwegian gas to Europe increased, the crucial supply of hydropower could soon come to a halt due to unseasonably low water levels in Norway as another heat wave sweeps across the Nordic region, Germany and neighbouring countries.

Further gas cuts "main risk" for economy

Warning of detrimental effects of further reductions in Russian gas supplies to Germany, the economy minister Robert Habeck said: "Reduced gas supplies from Russia are depressing sentiment and a further curtailment represents the main risk for future

economic development.

"Overall, however, the first half of the year "showed a solid performance in which the German economy demonstrated some resilience," he added. Gross domestic product (GDP) was corrected noticeably upwards in the first quarter and grew robustly, but there is an ongoing high inflation, mainly driven by energy and food prices.

The inflation rate fell slightly from June to July for the second time in a row to 7.5%,

down from 7.6% in June. The reduction of the energy tax on fuels including petrol, diesel and heating oil, the nine-euro ticket for public transport and, since July, the abolition of the renewables levy have slightly dampened price increases, the economy ministry said in a statement. New levies and taxes are subject to a fierce debate in Parliament and in the wider public which braces for tough decisions and the need for fuel savings in the winter ahead. ■



Map of Norwegian gas pipelines to continental Europe and the UK





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Whitetail Clean Energy selected as one of UK's three Power CCS projects

8 River Capital's Whitetail Clean Energy has been selected as one of three so-called "Power CCS 2 emitter projects" to proceed to the due diligence stage of the Phase-2 Cluster Sequencing process. Now the project just needs a dispatchable power agreement (PPA) to sell up to 350 MW of clean power as well as captured carbon into the UK's East Coast Cluster.

Technically speaking, Whitetail will be using natural gas and oxygen in a Allam-Fetvedt Cycle to create electricity. The excess carbon dioxide (CO₂) not used by the co-generation process is intended to be captured and stored under the British North Sea, making use of carbon sequestration under the sea level. The innovative power plant is included in the UK's Net Zero Teeside cluster and due to start generating in 2025.

After passing this UK Government threshold, Whitetail can proceed to the due diligence stage of the Phase-2 Cluster Sequencing process. 8 Rivers said it will be working with the UK Government to secure a dispatchable PPA, bringing the UK closer to its first virtually zero emissions power plant.

8RH2 clean hydrogen tech

The technology developer 8 Rivers Capital is best known for the invention of the 8RH2 clean hydrogen technology. By deploying "deep decarbonisation technologies" like power gen plus CCS projects at a macro-scale the British government wants to fast-track its goal of reaching carbon-free power generation.

The pilot Whitetail project is backed by the UK's Department for Energy and Climate



View of Wilton site for the Whitetail Power CCS project

Change (DECC) in 2012 with £4.9 million of the CCS Innovation Programme.

Scalable, UK-specific design

The Department for Business, Energy and Industrial Strategy (BEIS) subsequently provided further funding to support a Pre-FEED study in 2020, focused on delivering the scalable, UK-specific design. During the construction phase, Whitetail Clean Energy is expected to support over 2,000 direct, indirect, and induced jobs.

CEO of 8 River Capital, Cam Hosie said the project selection was "truly a milestone, representing more than 10 years' work and collaboration with the UK Government." Being selected as a Phase 2 emitter project, in his view, will enable developers to "progress and enter negotiations to secure a dispatchable power agreement ahead of first operations in the next decade." ■

Loop Energy to open H2 fuel cell factory in Essex this month

Loop Energy, manufacturer of hydrogen fuel cells for commercial mobility, will extend its presence in Europe by opening a new factory in Grays, Essex, later this month. The move comes in reaction to growing customer demand for Loop Energy's fuel cells in continental Europe and the UK, where diesel and petrol vehicles will start to be banned from 2030.

Listed at the Toronto Stock Exchange, Loop Energy raised \$100 million Canadian Dollars so far and is targeting the commercial vehicle sector, including buses and heavy goods vehicles (HGVs). According to data by the British government, diesel and petrol HGVs made up 18% of all road emissions in 2019, amounting to 19.5 metric tons carbon dioxide equivalent (MtCO₂e).

CEO Ben Nyland said Loop Energy expects to service a truck and bus market size upwards of US\$15 Billion over the next 2 to 3 years, and the UK facility is established as the localized support center for these vehicles." The announcement of the new factory in Essex comes a month after Loop Energy signed a multi-year fuel cell supply agreement with UK-based Tevva, which includes delivery commitments in excess of US\$12 million through 2023. ■

HydrogenOne invests €10 million in Dutch H2 pipeline firm Strohm

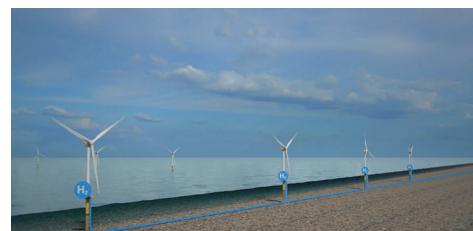
HydrogenOne Capital Growth has agreed to invest £8.4 million (€10 million) in Strohm Holding alongside Shell Ventures, Chevron Technology Ventures and Evonik Venture Capital, bringing the first funding round to a total €14 million. The Dutch company said it may also invest up to €2 million in the second round, which hoped to source another €6 million in late 2022.

Over 9 gigawatts (GWs) of offshore green hydrogen projects have been proposed in the North Sea basin, with further multi-GWs growth potential, alongside Carbon Capture, Utilisation and Storage (CCUS), all of which will require specialist pipeline solutions at scale. Strohm said it wants service the development of this offshore hydrogen and CCUS market.

"We recognised the fit between clean hydrogen and offshore wind at an early stage, and developed a compelling pipe solution to support it. TCP can transfer up to nine times

the amount of energy compared to a cable, and can be used to store hydrogen, thereby increasing the uptime of offshore wind farms. The pipe's flexibility, lack of corrosion, fatigue and embrittlement make it the superior pipeline solution for offshore wind farms, generating hydrogen," explained Martin van Onna, Strohm's managing director. "The investment by HydrogenOne allows us to increase our capacity to service this growing market."

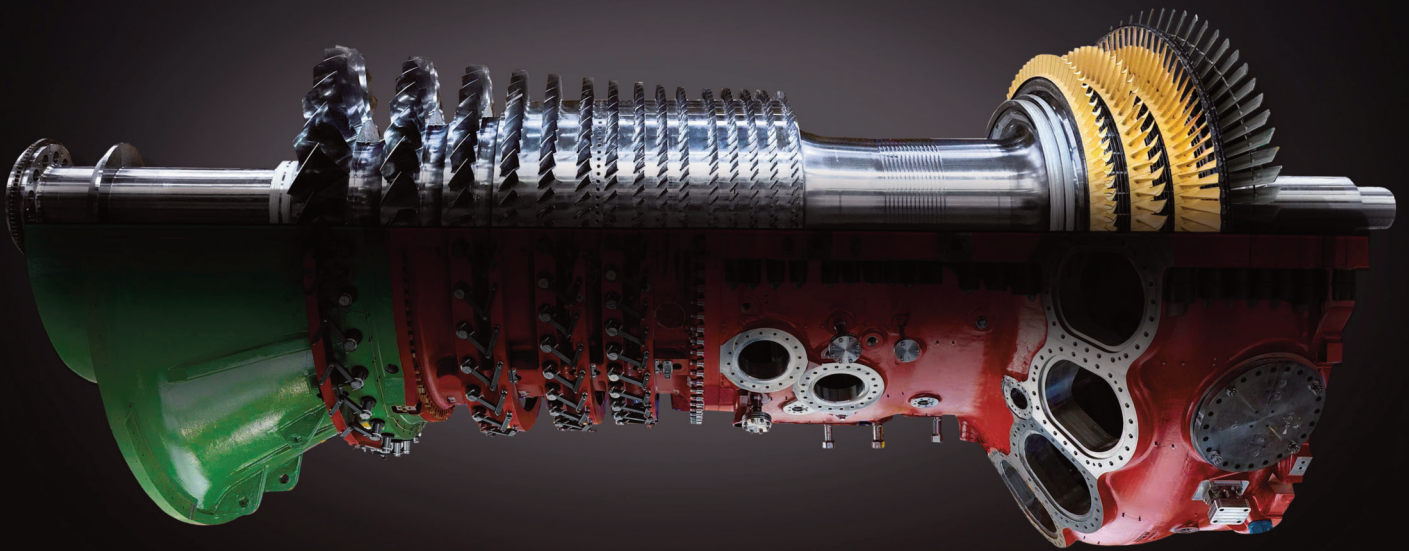
From its base near Amsterdam, the Netherlands, Strohm is a market leader in design and manufacturing of Thermoplastic



Composite Pipe (TCP). The material is more cost effective than steel pipe and has about 50% less manufacturing greenhouse gas emissions. TCP pipelines can be used to safely transport hydrogen, CO₂, ammonia and water, where steel solutions suffer from embrittlement and corrosion. ■

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GenCell partners with Milani to deploy H2 backup power in Italy

Israel-based GenCell Energy, an Israeli fuel cells maker, has partnered with the Italian engineering company Milani to install zero-emissions hydrogen (H₂) and ammonia-based fuel cells to power critical infrastructure in Italy. The first GenCell BOX long-duration backup power systems was deployed at Milani's headquarters outside Milan to show how the technology can decarbonise the energy use of buildings.

Li-ion battery storage combined with IoT solutions-based energy saving plants and security access control systems are becoming popular in cities across Europe amid more stringent regulations for the carbon footprint of buildings, corporate ones. Milani, an Italian provider of electrical and ELV systems engineering, installation and maintenance for European commercial and industrial (C&I) assets, hence decided to incorporate zero-emission fuel cell technologies into its solution decentralized power gen solutions.

GenCell's alkaline fuel cells and green ammonia-to-energy technology can deliver clean uninterrupted power, and it is as green fuel on which the devices run. This sets

GenCell in a "far superior position" as a "well-to-wheel total green energy solution provider," the company noted.

CEO Rami Reshef reciprocated Mr Milani's comments by hailing the "interest and cooperation" his company is receiving from the proficient and experienced energy engineers at Milani. "With deep knowledge of European design and engineering preferences, culture and market trends and a proactive 360° approach to customers and designers that combines business initiative and creativity with tested, certified methods and practices – we believe that Milani has the "X factor" that GenCell invests in all our solutions and programs to go the extra mile.

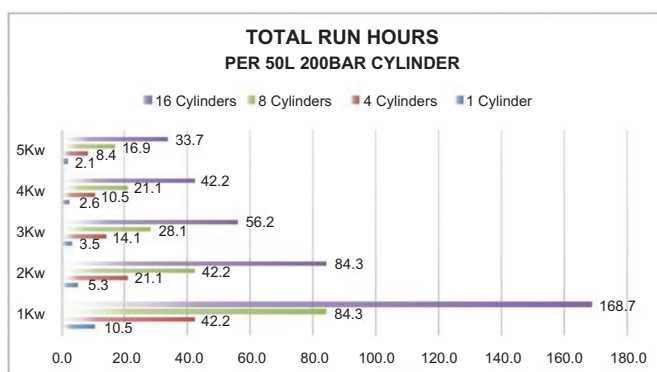
SDG&E orders 180 MWh microgrid storage from Mitsubishi

San Diego Gas & Electric (SDG&E) will power critical community services like hospitals, schools and data centres, by adding Mitsubishi Power's Emerald storage solutions (39 MW/180 MWh). The Elliot, Clairemont, Paradise, and Boulevard microgrid battery energy storage systems (BESS) will connect to existing infrastructure in the San Diego region. The microgrid BESS projects are due operational in mid-2023.

"We live in a time when growing threats from climate change and extreme heat waves can increasingly impact grid reliability," said SDG&E Director of Advanced Clean Technology Fernando Valero. "By expanding our energy storage portfolio, we are helping our region and critical community facilities become more resilient."

SDG&E was an early adopter of battery energy storage in the western United States. "We're excited to make an impact with SDG&E on these four microgrid projects in addition to the Pala-Gomez Creek energy storage project announced earlier this year," said Tom Cornell, senior VP, energy storage solutions at Mitsubishi Power Americas. The projects were approved by the California Public Utilities Commission on June 23.

Emerald storage solutions include an integrated plant controller, which is an energy management system (EMS) and supervisory control and data acquisition (SCADA) system with real-time BESS operation and a monitoring/supervisory control platform. These features help ensure that critical public service facilities are getting continuous power supply during peak demand and unexpected outages. In May 2022, Mitsubishi Power was awarded cybersecurity certification IEC 62443 ML2 for the Security Development Lifecycle Process (SDL), which validates that all products developed for its Emerald storage.



Wärtsilä re-powers Senegal's largest gold mine to boost production

Senegal's largest gold mine will boost its output thanks to 18 MW extension of the mine's onsite power plant, carried out by Wärtsilä. The upgrade allows the owner of the gold mine, Endeavour Mining to fully integrate the entire power gen capacity at the site while ensuring flexible supply of electricity to all machinery to meet production schedules.

Located in the Kedougou region, eastern Senegal, the Sabodala-Massawa mine is the country's largest producing gold mine. Endeavour said its planned mine expansion will transform Sabodala-Massawa into a "top-tier gold asset with incremental production."

To this end, Wärtsilä has been contracted to deliver the power plant upgrade under a complete engineering, procurement and construction (EPC) contract. The order was placed by Sabodala Gold Operations and it has been booked in Wärtsilä's order intake in the third quarter, the Finnish company said. The project is set to be completed and commissioned before the end of 2023.

The onsite power plant is not being connected to the grid, which means the captive plant needs to be able to provide a reliable supply of electricity at all times. "No power equals no production," said Marc Thiriet, Energy Business Director, Africa West, Wärtsilä.



View into the Sabodala-Massawa gold mine

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