



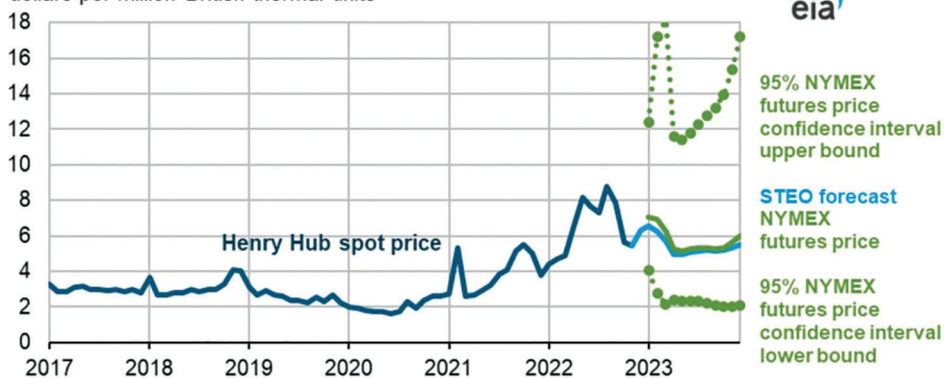
US gas prices to rise in Q1-2023 on winter demand and LNG exports

Natural gas prices in the US are forecast to increase to over \$6/MMBtu in the first quarter of 2023 due to higher winter demand and rising exports as Freeport LNG is seen ramping up to reach full capacity in March. Meanwhile, capacity constraints on gas pipeline could make New England power prices jump 35% to over \$200/MWh in January.

Henry Hub spot prices averaged \$5.50/MMBtu in November, but prices are bound to rise due to high domestic demand for space heating and power generation as well as growing demand for feedgas from liquefaction and export plants. Freeport LNG announced it will resume partial operations in mid-December, following an outage that began in June 2022, and will ramp up its liquefaction units over the following three months.

"Gas prices will begin declining after January as storage levels move closer to the previous five-year average, largely as a result of rising natural gas production," analysts at the US Energy Adminis-

Henry Hub natural gas price and NYMEX confidence intervals
dollars per million British thermal units



Data source: U.S. Energy Information Administration, Short-Term Energy Outlook, December 2022.

tration (EIA) said, but warned "the possibility of price volatility remains high."

US dry gas production tops 100 Bcf/d

More drilling activity in Haynesville and Permian Shale has pushed US dry gas production to over 100 billion cubic feet per day (Bcf/d) in October and November, exceeding pre-pandemic levels.

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Australia's gas intervention threatens power supply; Woodside warns

Woodside Energy, the leading Australian oil and gas company, has condemned the government's move to impose caps on coal and gas prices. "This unprecedented market intervention risks driving investment out of the system," Woodside COE Meg O'Neill warned, calling on the government to help the industry revert falling domestic gas supply for dispatchable power generators.

Prime Minister Anthony Albanese had proposed plans to cap gas prices at A\$12 per gigajoule and coal prices at A\$125 per tonne for one year with the aim to lower escalating energy bills of industry and household customers. If enacted, the cap would limit the rise in retail electricity prices to an estimated 23%, rather than a 36% surge anticipated without any state intervention.

The emergency price caps would only apply to new contracts, signed during the year when the measure is in place, the treasury specified. For



multi-year contracts, the treasury urged the industry to institute a "sensible pricing provision" which could give producers a "reasonable return on capital" beyond the mere production costs.

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Such substantial growth in supply could lower prices at Henry Hub to \$5.62 per million British thermal units (MMBtu) in the first half of 2023, down from around \$6.34/MMBtu in December.

Production could rise another 2% slightly in 2023, averaging 101 Bcf/d for the year – but this growth is hampered by pipeline constraints which limits the onward flow of gas to industry, power generators and liquefaction terminals. For the second half of next year, the EIA's latest

drilling productivity report shows that developers have scheduled more pipeline expansions which should help increase dry gas production further from already high levels.

"Although we continue to expect natural gas production in the Permian Basin to be limited early in 2023 by the lack of pipeline capacity to bring associated natural gas production to market, we expect that these constraints will be resolved earlier than we had previously assumed," EIA analysts ex-

plained. Debottlenecking of pipeline capacity could also lead to "slightly more crude oil production" than anticipated earlier.

Supply growth in the North American gas market could support 29 billion cubic feet per day (bcf/d) of production from 2022 to 2023, tripling its current size, Wood Mackenzie forecasts. Though producers still focus on capital discipline, investment in new fields increases with the market expansion is seen to be "equivalent to adding two new Permian basins." ■

Oil & gas sector profits stay high despite windfall taxes, Fitch says

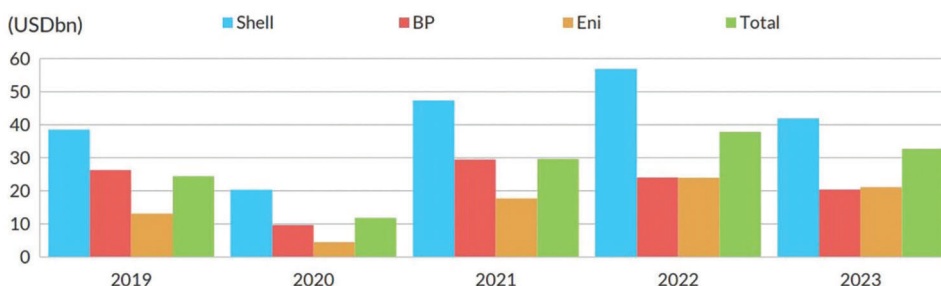
Earnings and profits in the oil and gas sector will remain high despite windfall taxes imposed in some countries and softening hydrocarbon prices in a slowing economy, Fitch Rating reckons. Shell, Eni, BP, and TotalEnergies are expected to have a strong post-dividend free cash flow in 2023, though Capex remains tight as companies stay focussed on cost control.

Large European oil and gas companies are set to perform strongly across both upstream and downstream segments in 2023, due to high prices and reduced supplies of refined products, especially diesel, from Russia. Chemicals operations, in contrast, are likely to be negatively affected by high gas prices.

Majors are raising dividends and buybacks over and above existing policies as they have not fully tracked record earnings in 2022, analysts commented. For example, Shell has increased 4Q22 dividends a share by 15% against the target 4% annual growth outlined in its policy and Eni has increased its initial €1.1 billion buyback for 2022 to €2.4 billion.

"Inflation [and windfall taxes in some

EMEA majors' funds from operation



Source: Fitch Ratings

countries] will bite but most companies have significantly reduced costs during the period of low oil prices, which will contribute to their cash flows. Overall, the sector per-

formance will remain broadly in line with that in 2022 and significantly stronger than in the mid-cycle," commented Fitch analyst Dmitry Marinchenko. ■

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But the upstream industry condemned the plan, regardless. Samantha McCulloch, CEO of the Australian Petroleum Production

& Exploration Association dismissed the powered provided to the state through the bill as "extraordinary," saying they would allow government "to control the entirety of the market and intervene in an essentially unlimited way."

The Woodside CEO, meanwhile, said she supports policies that aim to bring down cost of living pressures for Australian households, but the government's proposed market intervention, in her view, "will not meet this objective and could make matters worse." The policy to cap prices will not address falling domestic gas supply and the increasingly critical role of gas in providing dispatchable power to backup Australia's rapid renewables build-out. "These are the primary factors that are driving higher energy prices in the east coast gas market, rather than solely the

impact of the tragic war in Ukraine," O'Neill stressed.

"We need to unlock gas supply now," she said, specifying Woodside has been looking at options to increase supply, e.g. through more exploration spending and new LNG import terminals on the east coast. "No one wants to see energy shortages and gas rationing," she said in reference to the acute power shortages along Australia's east coast this summer. Electricity demand from industry rebounded sharply as the economy recovered from the pandemic, but the output from coal-fired power plants fell sharply over the summer due to plant outages and problems with coal delivery from mines in New South Wales. The Australian Energy Market Operator (AEMO) had to intervene and dedicate firm volumes of domestic gas to power generators. ■

Gas to Power Journal

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Uniper aims to feed first LNG into German gas grid on December 22

First flows of regasified LNG into the German gas grid are scheduled for December 22, when Uniper will start operations of a chartered floating storage and regas unit (FSRU) at the North Sea port of Wilhelmshaven. During its commissioning phase until mid-January, the FSRU will release between 15 and 155 gigawatt-hours (GWh) of gas per day.

Germany has been rushing to charter floating LNG import terminals to source non-Russian gas supplies for industry and power generation – but the cost for this new infrastructure is going through the roof: The government chartered five FSRUs which are estimated to cost €9.7 billion over the time from December 2022 until the end of 2038, the German economy ministry revealed. This price tag is three times higher than initially budgeted.

Wilhelmshaven is set to win the race for first LNG to Germany over RWE's rival venture at Brunsbüttel, where first LNG will not

arrive before the New Year.

Construction of the jetty at Wilhelmshaven was finished in mid-November – just 194 days after works started. In addition, a pipeline of around 30 kilometres length has been built to feed the regasified LNG into the German gas grid at the Etzel entry point. The pipeline will initially have a capacity of 10 bcm but will later be expanded to carry up to 28 bcm. That way it could accommodate supply from up to three FSRUs in the future.

Waiting for FSRU 'Hoegh Esperanza'

Now, Uniper is now waiting for first FSRU 'Hoegh Esperanza' which will have 170,000 cubic metres of LNG onboard as it reaches Wilhelmshaven. Following the completion of works in Damen's yard in Brest, France, the FSRU departed to Spain and took a cargo at the Sagunto LNG ter-

minal before setting sail to the German North Sea port, AIS shipping data shows.

'Hoegh Esperanza' is a modern, purpose-build FSRU, so it can cycle through its commissioning cargo, i.e. use cold LNG to cool down onshore fixtures and re-liquefy warmed up gas and boil-off onboard to reinject it into the gas grid.

Regular LNG shipments to Wilhelmshaven are set to follow in January, though Uniper fell short of disclosing where the gas will originate from. The United States is widely expected to supply the bulk of LNG to Germany, alongside cargoes from merchant liquefaction plants like Damietta and Angola LNG as well as re-routed spot cargo in the Atlantic Basin.

Starting from 2026, Germany will also receive Qatari LNG via a deal arranged with the help of the global oil giant ConocoPhillips. QatarEnergy agreed to ship 2 mtpa of liquefied gas over 15 years from its North Field expansion project via Ras Laffan to the an FSRU at Bunsbüttel, operated by Uniper's rival supplier RWE. ■



US dry gas production tops 100 Bcf/d despite pipeline constraints

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Supply growth in the North American gas market could support 29 billion cubic feet per day (bcf/d) of production from 2022 to 2033, tripling its current size, Wood Mackenzie forecasts. Though producers still focus on capital discipline, investment in new fields increases with the market expansion seen to be "equivalent to adding two new Permian basins."

The onset of new supply, combined with infrastructure bottlenecks will initially put

downward pressure on gas prices – until new LNG export facilities come online towards the end of the decade, creating an outlet to international demand centres.

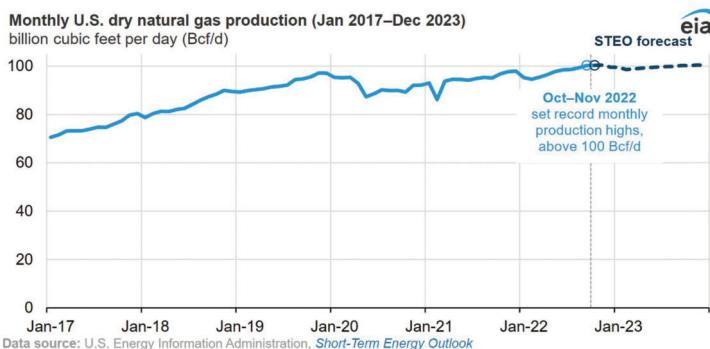
Abundant, low-cost resources

North America is home to estimated 2,750 trillion cubic feet (Tcf) of natural gas resources, of which around 1,700–2,000 Tcf could be produced at a cost between \$3 and \$4/MMBtu.

At stable production prices of around \$3/MMBtu, North American LNG exports are globally competitive and can provide reliable and affordable gas to European consumers at a cost below \$8/MMBtu – compared with re-

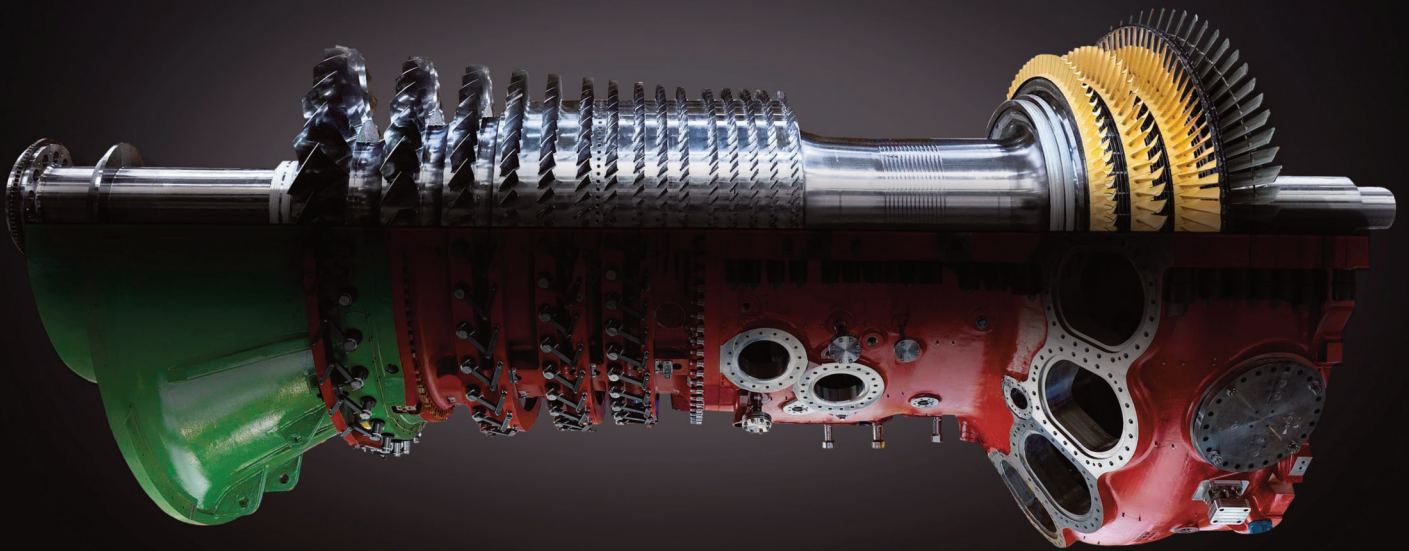
cent prices of \$40 to \$70/MMBtu, according to McKinsey calculations.

But gas prices at demand centres are highly volatile and often rise well above the \$3/MMBtu threshold due to pipeline constraints. Yet, if investment in new gas pipeline capacity is not forthcoming, the expansion of export capacity alone could result in a price increase of more than \$1/MMBtu for US and European consumers, analysts warn. ■



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Keadby 3 becomes UK's first CCS power plant to win planning consent

SSE Thermal and Equinor's Keadby 3 power station in the Humber has become the first power CCS project in the UK to receive planning permission. With 910 MW generating capacity, Keadby 3 would capture up to one and a half million tonnes of CO₂ a year – equal to 5% of the UK government's 2030 target.

The proposed plant in North Lincolnshire received a Development Consent Order, following an extensive period of consultation. Assuming success in the UK Government's Cluster Sequencing Process, project partners will take FID so that the power station could be operational as early as 2027.

"We are doing everything we can to ensure that Keadby 3 Carbon Capture Power Station is in the best position possible when the UK Government confirms the next steps around its plans to decarbonise industrial clusters," said Catherine Raw, managing director of SSE Thermal.

A Front-End Engineering Design (FEED) contract for the proposed plant was already awarded earlier this year to a consortium comprising Aker Solutions, Siemens Energy and Altrad Babcock, with Aker Carbon Capture will deliver the carbon capture technology.

Venturing into CCS, Equinor and SSE



Site of SSE's Keadby power stations

Thermal are also working on the Peterhead Carbon Capture Power Station in the north-east of Scotland. In addition, they are developing Keadby Hydrogen Power Station,

which could be the world's first large-scale 100% hydrogen-fuelled power stations, supported by Aldbrough hydrogen storage project. ■

LA City Council to hold second vote on Scattergood H2 conversion

Though Los Angeles' City Council has approved the \$800 million plan of converting the 850 MW Scattergood Generating Station to run on hydrogen, instead of natural gas, it needs a second vote this week when five new council members take their seats. A shift to green hydrogen would help the operator transition to 100% renewable energy by 2035.

Situated in the Playa del Rey area of Los Angeles, Scattergood has been a stable power source for California's largest metropolitan area. Without a significant generating resource at Scattergood, the city's power supply would be at risk.

"The easiest thing to do is to say, 'Climate change is a crisis,'" Council President Paul Krekorian said at a committee meeting. "It's a lot harder to figure out: How do we address climate change in a city of four million people and ensure that we can keep the lights on?"

Built in the late 1950s, Scattergood originally consisted of three steam turbine generators that burn natural gas in boilers. To meet air and water quality standards, Scattergood Unit 1's capacity was lowered, while Unit 3 was replaced by a more efficient combined-cycle generator. In addition, two smaller, simple cycle gas turbines were built. The new turbines, known as Units 4, 5, 6 and 7, have a total generating capability of 534 MW.

Critics argue the hydrogen volume required to fuel Scattergood would require more than 122 million gallons of water to power the plant and cost more than solar, wind or battery storage. Some council members said hydrogen projects are being propped up by oil and gas companies, which may be hoping to blend hydrogen into their operations.

Others are concerned that the \$800 million price tag to convert the plant might easily increase to \$ 1 billion – money that might be better spent on wind and solar power resources. ■



View of Scattergood Generating Station near LA

CPV spends \$3 billion on combined-cycle plant with CCS in Virginia

Competitive Power Ventures (CPV) will invest \$3 billion to build a combined-cycle gas power station with carbon capture technology in Doddridge County, West Virginia. The 1,800 MW Shay Energy Center will go into operation later this decade and power nearly 2 million homes and businesses, while benefitting from the expanded the 45Q federal tax credit for carbon capture.

In addition to federal legislation, known as the Inflation Reduction Act, the state of West Virginia passed key rules earlier this year to codify how carbon sequestration would work in the Mountain State. Peter Podurgiel, CVP's head of project development said Doddridge County had been "extremely professional and receptive to the Shay project."

The name of the project – CPV Shay Energy Center – pays homage to West Virginia's official state steam locomotive, the Shay No. 5, the operator said. By pairing efficient turbines with CCS, the Shay plant will provide a source of low-carbon, dispatchable power to facilitate the integration of CPV's growing renewable energy portfolio.

Following permitting and construction, which will include up to 2,000 skilled jobs at

peak, the project is meant to be in operation way before 2030, the operator said without specifying the timeline.

"CPV's decision to site this project in Doddridge County is a game changer," said Jennifer Wilt, director of the Doddridge County Economic Development Authority. "This investment will not only create a large number of jobs during construction but will also

support high-paying careers for a generation to come as this area becomes a key player in the country's decarbonization efforts." ■



CVP's Fairview Energy Center (1,050 MW)

Guyana gets CH4/Lindsayca to build 300 MW plant at a lower price

The government of Guyana has made CH4/Lindsayca agree to build a 300 MW gas-fired power plant and an NGL plant at a reduced price. The EPC contract was awarded at \$759 million – instead of \$898 million as initially agreed – after some components of the original bid were weeded out, with plants requested to be ready by December 2024.

During hard-fought negotiations, several aspects of the original bid were erased which brought down the price tag substantially. "The Lindsayca bid had provisions for a number of things that were not needed as part of the manufacturers requirement so those were removed," said Guyana's vice president Bharat Jagdeo.

The second-ranked bidder, PowerChina, had offered to build the plants for just \$704 billion – but they could not ensure to meet the December 2024 deadline. Failure to do so, would have resulted in huge penalties.

The government-owned power plant is meant to bring down the energy cost in Guyana. Electricity at the 300 MW combined-cycle power plant is expected to be produced at less than 5 ¢ per kilowatt-hour and would be sold at

15 ¢ per kWh – way below the 25-30 ¢ per kWh that Guyanese currently have to pay.

The natural gas liquid (NGL) plant, meanwhile, is hoped to turn Guyana from being an importer of cooking gas to and importer, allowing the state to reap some early return-on-investment. Esso Exploration and Production Guyana is managing the pipeline infrastructure to land the gas onshore from the Stabroek block to be fed into the NGL plant. ■



Render of the NGL plant in Guyana

NEWS NUDGES

ADB backs CCGT in Bangladesh

The Asian Development Bank (ADB) is considering to support a 548 MW combined-cycle gas power plant in Narayanganj on the outskirts of Dhaka. The plant would be fuelled by regasified LNG, though critics say the project lacks affordable gas supply and would delay Bangladesh's transition to grid-connected solar power plants which currently just account for 1% of the country's energy mix.

Siemens Energy halves Scope 1&2 emissions

Siemens Energy has reduced greenhouse gas emissions in its direct area of responsibility (Scope 1&2) by 21% this fiscal year and managed to halve emissions since the baseline year 2019 as it aims to be climate-neutral by 2030. Turning to wind and solar power greatly helped Siemens Energy to lower its greenhouse gas emissions: "Conventional contracts were replaced more quickly by new agreements or supplemented by guarantees of origin, where it was impossible to purchase renewable energy directly from the supplier," CEO Christian Bruch explained.

Dubai's H-Station power plant Phase 4 to start up in early 2023

Dubai Electricity and Water Authority (DEWA) is preparing for a start-up of Phase 4 of its H-Station power plant in Al Aweer in the first quarter of 2023. The 829 MW open-cycle gas power plant is being built at a total cost of 1.1 billion UAE dirhams (\$299.5 million) by a consortium of Siemens Energy and Elsewedy Power.

Phase 4 consists of three Siemens SGT5-4000F gas turbines, three SGen5-1200A generators and a control system as well as gas compressors from MAN and a gas treatment station from Petrogas. The unit is 93% complete and is currently undergoing pre-commissioning tests; once in full operation,

it will bring H-Station's total generating capacity to 2,825 MW.

The project achieved a 93% completion rate and is well on track enter full commercial operations early next year. Nasser Lootah, vice president of generation at DEWA noted project's work is progressing according to schedule, while maintaining the highest levels of health, safety, quality, and efficiency.

Testing and commissioning has started in the fourth quarter of this year to make sure the plant will be capable to run smoothly at temperatures of up to 50 degrees Celsius and 30% relative humidity.

Stable operation is vital as H-Station is one

of DEWA's key projects to meet the reserve margin criterion set for peak electricity demand in Dubai. Currently, DEWA has an installed power gen capacity of 14,317 MW and the company's CEO vowed to "provide a robust infrastructure that keeps pace with rapid developments in Dubai and the increasing demand for electricity and water in the Emirate."



H-Station Phase-4 is 93% complete

Wärtsilä hands over fast-ramp CHP to SachsenEnergie

A flexible combined heat and power plant (CHP), supplied and built by Wärtsilä, has been commissioned and handed over to SachsenEnergie for commercial operation. Running on eight Wärtsilä 31SG gas engines, the plant will supply both 94 MW of electricity and 84 MW of district heating for the city of Dresden in the eastern part of Germany.

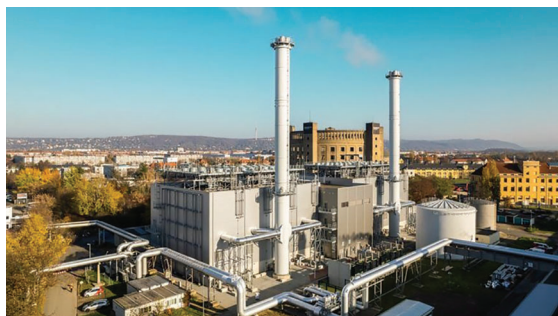
The engines of the highly automated plant can reach full output in five minutes from start-up and can synchronise with the grid in less than 30 seconds. This is important for SachsenEnergie, as it allows for the CHP to participate in grid balancing markets and facilitate greater integration of renewables into the system.

"After intensive testing and validation, we are confident that we can provide high efficiency for the winter while at the same time providing the necessary flexibility," commented Dr. Frank Brinkmann, CEO of SachsenEnergie.

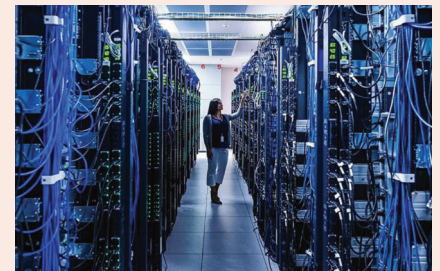
The power plant was delivered by Wärtsilä on an engineering, procurement, and construction basis, and the Finish manufacturer will also maintain the facility for ten years. Performance targets for the CHP will be determined on the basis on measured data, with Wärtsilä

guaranteeing these targets are met and maintained throughout the duration of the service accord.

The engine-driven CHP was built near SachsenEnergie's existing power plant at Dresden-Reick, commissioned in 1976 to provide district heating for some 3500 new-built homes. The original heat-driven power plant used to provide 266 MW of thermal energy and 2 MW of electricity and had been dispatched by DREWAG.



CHP in Dresden-Reick



Microsoft plans to build gas power station for data centre in Dublin

US software giant Microsoft is seeking permission to build a standby 170 MW gas-fired power station next to its new €900 million data centre in Dublin. The standby plant as well as 21 emergency gas gensets are needed to ensure uninterrupted power supply given that the data centre is situated in an area with constrained grid capacity.

The data centre will consist of two buildings, called Dub 14 and Dub 15, for which planning permission is in place to cover nearly 145,000 square feet each.

Ireland is home to some 70 data centres which consumed a larger amount of electricity than all rural homes last year. The TSO EirGrid anticipates that 28% of Ireland's electricity demand will come from large energy users such as data centres by 2031.

Keen to reign in demand, the Commission for Regulation of Utilities (CRU) in 2021 placed a moratorium of sorts on the building of new data centres. But the environment minister Eamon Ryan said last month the high electricity use of data centres would be a "short-lived problem" which will be alleviated by developing offshore wind at scale.



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A handwritten signature in black ink, likely belonging to Jill Evanko.

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