



Turkey's Botaş aims to launch Saros FSRU before end of January

Botaş, Turkey's state-owned oil and gas supplier, is preparing to launch a floating LNG import unit in Saros Bay by the end of this month. Once operational, it will be Botaş' second FSRU next to the one at Dortyol and Turkey's third as the country aims to become an international gas hub, focussed on supplying southeast Europe.

To that end, Botaş just signed a long-term deal with Bulgargaz which gives the Bulgarian gas company access to Turkey's gas network and LNG import terminals. The agreement allows Bulgaria to transport about 1.5 Bcm of gas a year and Bulgargaz already made plans to book regas slots for about 1 Bcm/y at Turkish LNG terminals in a bid to replace halted Russian gas supplies.

Currently, Bulgaria meets about a third of its annual gas demand by importing 1 Bcm from Azerbaijan and imports much of the rest through Greece. The deal with Botaş may well make Turkey the main transshipment hub for gas supply to Bulgaria and its eastern European neighbours, which all used to heavily depend on supply from Russia's Gazprom.

Arrival of the FSRU in Saros Bay, at Turkey's north-eastern shore, is imminent with local media reporting the chartered FSRU would be



Vasant 1, originally built by Hyundai Heavy for LNG imports to India

the 180,000-cbm Vasant 1, originally built in 2020 by Hyundai Heavy for Swan Energy's delayed Jafrabad LNG import facility in India. Before setting sail for Turkey, Vasant has loaded a cargo at the Idku LNG terminal in Egypt, according to shipping data.

Gazprom eyes sales to Europe via Turkey

Turkey's aspiration to become a regional gas hub has been fuelled by Gazprom's proposal to use the country as an intermediary for

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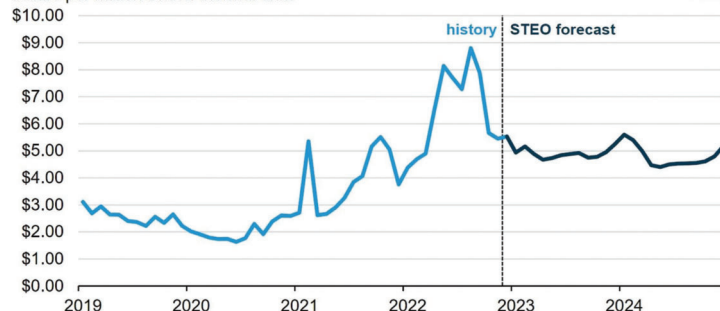
Henry Hub spot gas price to stay around \$4.90/MMBtu through 2024

The Henry Hub spot price is forecast to stay \$1.50/MMBtu below the 2022 average at around \$4.90/MMBtu this year and in 2024 as growing dry gas production outpaces domestic demand. Resuming exports from Freeport LNG will push up prices temporarily in the first quarter, but they soon retreat thereafter amid a 2% rise in gas production towards 101 Bcf/d.

The restart of Freeport LNG, announced for late January, will add about 2 Bcf/d to overall US gas demand while a forecast return of colder winter weather in early February would push up gas use for space heating in the residential and commercial sectors, the US Energy Information Administration (EIA) stated in its January Short-Term Energy Outlook (STEO).

But gas prices are expected to decline in the second quarter once winter weather subsides and to stay relatively flat for the rest of the year as dry

Monthly Henry Hub natural gas spot price (Jan 2019–Dec 2024)
dollars per million British thermal units



Data source: U.S. Energy Information Administration, Short-Term Energy Outlook (STEO)

gas production exceeds LNG exports. Overall US gas production is forecast between 100 Bcf/d and 101 Bcf/d in 2023, up 2% year on year while

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selling Russian gas to Europe. While most gas buyers in the EU do not want to enter direct contracts with Gazprom, buying free volumes on the spot market in Turkey would be politically acceptable.

Playing big, the President Vladimir Putin had offered to move the lost volumes from the Nord Streams along the bottom of the Baltic Sea to Turkey and the Black Sea region. It would take at least three years to

build a new gas interconnector, but there is plenty of spare capacity in the existing TurkStream pipeline.

With Gazprom having lowered deliveries to Europe by 43.4% in 2022, flows through TurkStream are well below its 31.5 Bcm of annual capacity and some 60% of the pipeline's capacity is understood to be unused.

The little gas volumes supplied via Turk-

Stream currently just benefit Turkey as well as Serbia and Hungary. Setting up a gas hub in Turkey would allow Moscow to mask its gas and reconnect indirectly with its long-standing European buyers. Putin had earlier proposed to deliver gas directly to Germany via the undamaged Nord Stream-2 pipeline, but the German government refused, noting Russia was "no longer a trustworthy supplier."

Low-carbon spending to rise by \$60 billion in 2023, led by H2 and CCUS

Significantly higher funding for hydrogen and carbon capture, utilization and storage (CCUS) will boost overall spending on low-carbon energy projects by \$60 billion this year, 10% more than in 2022, Rystad Energy finds. But spending slows after rising 20% in recent years because inflation-spooked developers tighten their purse strings as construction costs continue to soar.

Green energy investment had risen 21% in 2022 to overtake related oil and gas spending for the first time, analysts pointed out. But inflationary pressures hamper growth this year, largely because low-carbon investments are more short-cycled than fossil fuel industries and therefore more price-sensitive.

"The weaker-than-expected growth is not a reason to panic. Rampant inflation typically triggers fiscal restraint across industries, and spending will likely bounce back in the coming years. The outlook for hydrogen and CCUS is especially rosy as technology advances, and the large-scale feasibility of these solutions improves," said Audun Martinsen, Rystad's head of supply chain research.

Hydrogen and CCUS could grow 149% and 136%, respectively, with Rystad anticipating total hydrogen spending will ap-

proach \$7.8 billion in 2023, while CCUS investments will total about \$7.4 billion.

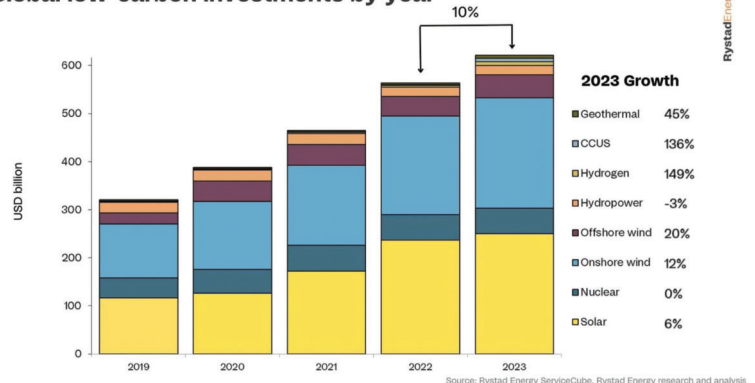
In contrast, the hydropower market is likely to shrink while nuclear investments are seen stay flat over the course of 2022.

Onshore wind spending is projected to rise by 12% to about \$230 billion and onshore wind investments could jump 20% to \$48 billion, analysts suggested.

Which industries will benefit the most?

Looking at individual industry segments, operations and maintenance firms are expected to achieve the highest revenue growth – 16% this year. These companies are more exposed to the overall installed operational capacity, which will grow this

Global low-carbon investments by year



year at a similar pace to 2022, with last year's additions entering their first full year of operations, analysts explained.

Logistics and vessel companies are estimated to take in 15% more this year, while spending in the equipment, materials, engineering, and construction sectors are seen rising by about 9% annually.

Geothermal drilling and CO2 injection will likely make the new and relatively tiny market of low-carbon, well-related services climb 33% this year, though overall investment still only total about \$3.7 billion.

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gas-burn from the power sector is bound to decline as more wind and solar photovoltaic capacity gets added.

With no new US LNG export terminal set start operation this year, there will be no outlet for growing domestic gas production which puts downward pressure on prices.

Following a seasonal increase in the first quarter of 2024, gas prices are expected to drop below 2023-levels as dry gas produc-

tion continues to rise to more than 102 Bcf/d on average. On the demand side, domestic gas use will likely fall further but this will be partly offset by rising exports. Monthly LNG shipments are seen surpassing 13 Bcf/d by the end of 2024 and keep rising in 2025 as new liquefaction projects like Golden Pass, Corpus Christi Stage II and Plaquemines create an additional outlet for growing supply.

Norway's gas exports to Europe up 3.3% in 2022, replace Russian supply

Exports of Norwegian pipeline gas to Europe increased 3.3% to 116.9 Bcm in 2022 as the TSO Gassco helped replace reduced deliveries from Russia. The biggest rise in exports was to Germany which received nearly 54.8 Bcm of gas, 11% more year-on-year, with deliveries near winter levels all year through, said Gassco CEO Frode Leversund.

“The year 2022 has, in all clarity, demonstrated how important Norwegian natural gas is and will be as a reliable energy source to Europe,” he said, specifying supply did not retreat during the summer months as normal as buyers in Germany were rushing to refill their gas storages prior to the winter, while direct LNG imports were not

yet feasible at the time. The recent opening of two floating LNG import terminals in Wilhelmshafen and Lubmin now helps German importers to further diversify supply, though pipeline gas from Norway will continue to outcompete LNG on cost.

“Demand for more renewable and cleaner energy, at the expense of coal, has rendered European countries more vulnerable. The war in Ukraine has led to an increase in the demand for stable and reliable deliveries of natural gas, and the production of Norwegian gas is vital for meeting the EU's energy needs,” Leversund said.

Supply to the UK, in contrast, fell by 11.7% to 29.9 Bcm in 2022 down from 31.6 Bcm a year earlier as capacities were not fully utilised given suppliers sought to send gas east, Gassco

explained. And given the new delivery point in Denmark is now in full operation, this eastward skew is likely to continue in 2023.

High upstream activity

Drilling activity remained high on the Norwegian continental shelf, thanks to a fiscal relief package adopted by the Parliament in Oslo in June 2021 which made oil and gas production profitable also at times of low prices and during the corona pandemic, he explained. This support, in Leversund's view, can make Europe to “expect stable deliveries of Norwegian gas for the foreseeable future.”

The opening of the Baltic Pipe in September helps Poland and Denmark to diversify supplies. Access to Norwegian gas may thus contribute to an annual emission cut of 70 million tonnes of CO₂, Gassco reckons, provided gas replaces coal for power generation. ■



Receiving terminal for Norwegian gas at Emden, Germany.

Cold snap forces UK's National Grid to ready three coal power plants

The UK's power grid operator has mandated three coal-fired units to be ready to produce electricity on Monday as cold winter weather coincided with falling wind power output and very little sunshine. Two coal-fired power units at Drax in Yorkshire and one at West Burton in Lincolnshire were warmed up as National Grid strives to avoid power shortages.

National Grid said its forecast show electricity supply margins will be “tighter than normal on Monday evening.” The three coal-fired units were hence instructed to be available to increase electricity supplies, should it be necessary during peak evening hours.

But the grid operator underlined this not guarantee the plants will actually be used – they are just an “additional contingency.”

Weather has a critical influence on the UK's energy mix: About a week ago, when winds of up to 82 miles per hour battered the North East, wind turbines were supplying 57.6% of the country's electricity needs, with gas just 9.3%. On Sunday, in contrast, the storm had calmed and wind power accounted for just 25% meaning gas-fired plants had to pick up the slack and produce a considerably higher 44% – supplemented by stand-by coal-fired plants as of Monday morning.

National Grid's order to reactivate coal power units is striking, given that the three plants at Drax and West Burton were initially

meant to be permanently decommissioned by now. High gas prices due to the global energy crunch has derailed plans for a coal power exit, not only in the UK but also in Germany.

Coal exit put in question

Gazprom's halt in deliveries makes burning coal for power generation in Germany necessary until 2030, at least, consulting firm McKinsey has found in its 2022 “Energy Transition Index.” Coal peaking plants will have to continue to replace gas peakers, analysts suggest, as the Europe-wide decision to end Russian gas imports has caused a nuclear renaissance in several countries and a rush to renewables in others.

Accelerating a coal exit will “not be achievable” in Germany, policymakers in the country's eastern states stress as it would

risk high electricity costs and de-industrialisation. A ‘coal exit law’, adopted in July 2020, sets out a pathway for exiting coal-fired power plants through 2038 but the incoming SPD and Green Party-led government has promised to end coal-burn earlier. But the Kremlin's war in Ukraine and subsequent gas supply crisis had forced Berlin to allow some already decommissioned coal power plants to be reactivated and fired up again. ■



Drax coal power unit

Clean energy tech market worth \$650 billion a year by 2030; IEA says

The global market for mass-manufactured clean energy technologies will be worth around \$650 billion per year by 2030 – more than three times today's level – if countries worldwide fully enact their energy and climate pledges, the International Energy Agency (IEA) forecasts. But the high concentration of resources and manufacturing poses risks to global supply chains.

If everything announced as of today gets built, the investment flowing into manufacturing clean energy technologies would provide two thirds of what is needed in a pathway to net-zero emissions," the IEA executive director Fatih Birol said, suggesting related manufacturing jobs could more than double to 14 million, up from currently six million.

However, high geographic concentrations of resource mining and processing as well as manufacturing has caused huge dependencies: For solar panels, wind, EV batteries, electrolyzers and heat pumps, the three largest producer countries account for at least 70% of manufacturing capacity for each technology – with China dominant in all of them.

Mining of critical minerals, meanwhile, is also concentrated in a small number of countries. For example, the Democratic Republic of Congo produces over 70% of

the world's cobalt, and just three countries – Australia, Chile and China – account for more than 90% of global lithium production, the IEA report specifies.

Tight supply chains

Prices for clean energy technology prices has soared due to tight supply chains in recent years, making countries' clean energy transitions more difficult and costly. Increasing prices for cobalt, lithium and nickel led to the first ever rise in EV battery prices, which jumped by nearly 10% globally in 2022. The cost of wind turbines outside China has also been rising after years of declines, and similar trends can be seen in solar PV.

"The world would benefit from more diversified clean technology supply chains," Dr Birol stressed. "As we have seen with Europe's reliance on Russian gas, when you depend too much on one company, one country or one trade route – you risk

paying a heavy price if there is disruption," he warned.

Waiting for supportive policies

Short lead-times of just 1-3 years to bring manufacturing facilities online mean that the project pipeline could expand rapidly once favourable policies are in place. The Inflation Reduction Act in the United States is a clear example of this, but there is also the Fit for 55 package and REPowerEU plan in the European Union, or Japan's Green Transformation programme, analysts commented.

According to the IEA report, only 25% of the announced manufacturing projects globally for solar PV are under construction or beginning construction imminently. The number is around 35% for EV batteries and less than 10% for electrolyzers as energy project developers and investors are watching closely for the policies that can give them a competitive edge. ■

US wind and solar to lower coal and gas generation through 2025

Rising wind and solar power supply will reduce US fossil generation this year and in 2024, the US Energy Information Administration (EIA) forecasts. With new projects coming online, wind and solar output will rise 2% to 16% of total generation, while the share of coal falls 2% to 18% and the one of gas dwindles 1% to 38%.

Falling construction costs, particularly for solar photovoltaic, have nearly tripled the installed capacity of solar PV over the past five years to reach about 74 GW at the end of 2022. Wind power, meanwhile, has grown by more than 60% since 2017 to about 143 GW of capacity.

Capacity-weighted construction costs for

solar PV fell 8% compared with 2019-figures, while average construction costs for both wind turbines and gas-fired generators increased by 8% for wind and 4% for natural gas over the same period, latest data in the EIA's Annual Electric Generator Report shows. The average combined-cycle generator construction cost increased by 22% to

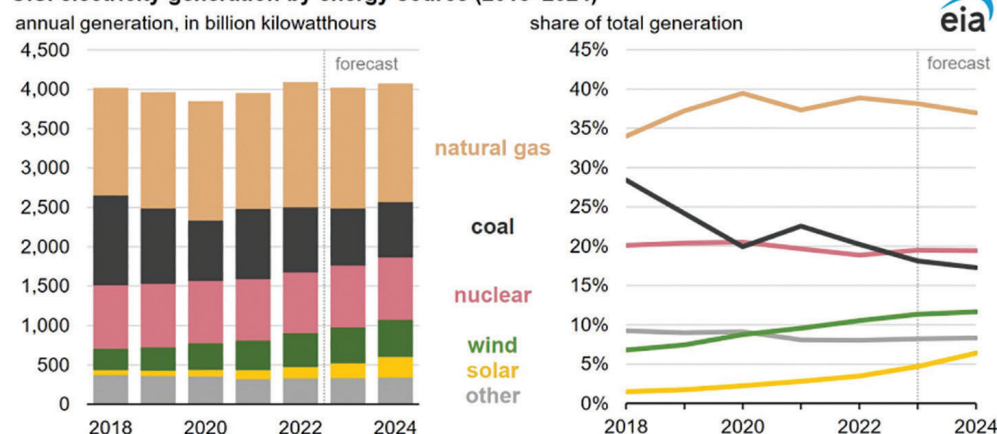
\$1,155 per kilowatt (kW) while costs across all solar panel types fell 8% to \$1,655 per kW, primarily due to falling cost for cadmium telluride tracking panels.

Massive solar PV build-out

Looking ahead, the EIA anticipates the extension of investment tax credits (ITC) and production tax credits (PTC) through 2050 for renewables will boost the contribution of solar PV by another 63 GW, or 84%, by the end of 2024. Due to this massive solar-build out, the share of solar power is forecast to rise from 3% of U.S. generation last year to 5% in 2023 and 6% in 2024.

Much of the growth in solar capacity is in Texas and California, where natural gas has been the primary source of electricity. But cheap solar power increasingly displaces gas generation while more carbon-intensive coal plants are scheduled for early retirement. ■

U.S. electricity generation by energy source (2018–2024)



Bord Gáis to spend €250 million on two gas-fired power plants

Ireland's Bord Gáis Energy and its parent, Britain's Centrica, have agreed to spend €250 million to build two gas-fired power stations in Dublin and Athlone. Both plants will generate 200 MW of electricity combined – enough to meet demand of 100,000 homes all year round, once complete by the end of 2024.

In addition to Bord Gáis' existing Whitegate power station, the construction of these two new plants will help balance the rising build-out of renewables on the system. Clearance works are already underway on the sites in Athlone, Roscommon and Profile Park, Dublin, while a construction and design tender is underway.

Though the two new plants are classified as 'unabated fossil fuel development,' Bord Gáis aims for up to 80% of its power generation to originate from renewable sources by 2030. To balance the renewables build-out, the operator plans to add some 2 GW flexible gas-fired capacity such as the plants at Dublin and Athlone.

"This new gas-fired capacity will be flexi-

ble enough to balance the grid as we expand solar energy and onshore and offshore wind. This capacity will be more efficient than our older, heavy oil and coal-fired power stations," said Bord Gáis managing director Dave Kirwan.

Ireland produces most of its electricity from gas and imports up to 75% of its annual gas demand, though the government is committed to source 80% of the country's electricity from renewables by 2030. To that end, the energy ministry recently granted

planning permission for seven large offshore wind farms and supports the construction of energy storage units. ■



Bord Gáis Whitegate power station

Centrica to turn Knapton Generating Station into green energy hub

Britain's Centrica will turn the former gas-fired Knapton Generating Station in North Yorkshire into a green energy hub. A 56 MW battery will be installed shortly and engineers explore how Knapton could be used for off-grid hydrogen production and solar energy, in line with Centrica's aim to create a 900 MW portfolio of solar and battery assets by 2026.

The four-acre of the former 42 MW Knapton Generating Station was bought from Third Energy under a multi-million pound deal. "We're quickly acquiring a portfolio of assets that can play an important role in facilitating a net zero future for the UK," said Greg McKenna, managing director of Centrica Business Solutions.

Making old fossil fuel assets sustainable

Knapton Generating Station had been producing electricity using gas from the Vale of Pickering fields for 25 years, but gas production ended in 2019 and the Knapton site has subsequently been cleared off all gas

processing equipment. The turbine of the power station was taken offline in 2020 and the overall plant dismantled in 2021.

"Taking an old fossil fuel asset and revitalising it to help advance the decarbonisation of the grid not only feels the right thing to do from a sustainability point of view, but aligns with our strategy," McKenna said, suggesting more similar projects are on the drawing board.

For starters, the battery at the site near Malton will utilise some of the 41.5 MW export capability of the existing grid connection. Centrica anticipates the 56 MW battery would be able to power around 14,000 homes for two hours.

Third Energy will retain the ownership of the 12 well-sites and associated gas pipeline network at the Knapton site. The company had already tried to realise a combination of solar energy, combined heat and power (CHP), battery storage and hydrogen but the site's new owner Centrica now wants to focus on producing off-grid hydrogen and energy storage. ■



Demolition works at the Knapton site

NEWS NUDGES

Aggreko to convert EDF coal power plant to biomass

Modular power provider Aggreko has won a tender by EDF La Réunion to provide mobile gensets to convert the Bois-Rouge power plant from coal to biomass. Converting the 108 MW plant to fast-ramp biomass engines is meant to reseed the renewables share on the island from 35% to 51%.

Lakeland clears McIntosh site for recip engines

Contractors of Lakeland Electric have imploded the retired Units 1, 2, 3 at the McIntosh power plant in Florida to make space for a reciprocating engine power plant, supplied by MAN Energy Solutions. A 260-foot stack and a 90-foot selective catalytic reduction (SCR) unit were brought down, with a controlled demolition of the boiler scheduled for March.

Amprion's grid-balancing costs soar to €3.5 billion

German TSO have faced soaring costs to balance the power grid amid French nuclear outages and rising renewables contribution amid high gas prices. Amprion, Germany's largest TSO, said the costs to manage the grid jumped to nearly €3.5 billion in 2022, up from €2.3 billion a year earlier though CEO Hans-Jürgen Brink reckons accelerating the grid expansion and a new market design could curb these costs significantly.

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