



Weekly News

3 May 2024

Auctions for 10 GW H₂-ready gas capacity in Germany to start before year-end

First auctions for Germany's planned 10 GW of hydrogen-ready gas power plants will be held before the end of this year, economy minister Robert Habeck announced. Details of the government's power plant strategy, aimed at incentivising the construction of 4 GW of H₂-ready plants with a capacity 2.5 GW each, are meant to be adopted by the Cabinet by summer.

Hydrogen-ready gas power plants are hailed as a clean and dispatchable power source to balance the growing supply of intermittent wind and solar power to the grid as Germany phased out nuclear power and is gradually exiting coal. The ruling coalition has set a target to boost the share of renewables from 50% to 80% of electricity produced by 2035.

Through the capacity auction, the government intends to support both the investment for building the plants and also their subsequent operation. The price difference between hydrogen and natural gas will be subsidised for a maximum of 800 hours per year.

LEAG's build-out plan hinges on tender criteria

Eastern Germany's largest lignite mine and power plant operator LEAG is preparing to build a 870 MW hydrogen-ready gas power plant. Construction could start in early 2025, with the plant to be



built on the site of the former coking plant in the southern part of the Schwarze Pumpe industrial park, though FID hinges on specific tender criteria in the government's power plant strategy.

Following financial close, construction of LEAG's 780 MW gas power plant would take around six years to build and could be commissioned and connected to the grid by 2030. The chosen site offers "optimal starting conditions," the utility claims, referring to an existing access to the natural gas grid and the 380 kV high voltage network of the regional grid operator 50 Hertz.

Since February, preparatory work is underway on the construction site. "We focus on dismantling the founding structure of the East

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Total to complete first phase of associated gas project in Iraq in 2025

TotalEnergies, the rebranded French oil major Total, wants to complete the first project phase of recovering flared gas produced at Iraqi oil fields and use it for power generation by the end of 2025. Out of 300 million cubic feet of gas planned, some 50 bcf will come from making use of associated gas, CEO Patrick Pouyanne said.

Last July, TotalEnergies signed a \$27 billion oil, gas and renewables deal in Iraq last week that offers faster, less risky payback through greater revenue sharing. Of each barrel of oil produced, 25% will go as royalty to the Iraqi state, while the remaining 75% will be shareholders' revenues, reimbursing them for capital and upstream costs.

CEO Pouyanne disclosed revenues from the Artawi oil field will be used to finance the recovery of associated gas, 600 mcf/d gas processing and a 1 GW solar power project. The aim is to supply southern Iraq with sufficient electricity to avoid rolling blackouts.



Focus on ending wasteful gas flaring

The deal that includes four oil, gas and renewables projects as well as efforts to recover flared gas at oilfields was first agreed back in 2011, and meant

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Photomontage of LEAG's planned gas power plant at Schwarze

and West coking plants that once existed there. We excavate around 30,000 tons of concrete at depths of up to four meters, which are then processed on the site for fur-

ther use," said LEAG project manager Axel Fehlt. Simultaneously, Fehlt and his team are in talks with potential industrial partners for the construction and have to make advance payments in the planning and approval procedures. Still, the prerequisite for starting to build the H2-ready gas and steam turbine plant from 2025 is the urgently expected political determination on the tender criteria and an agreement on state support by the EU. "Only on this basis can an investment decision be made," LEAG stressed.

Rival RWE waiting in the wings

RWE is already evaluating plans to build 3 GW of hydrogen-ready gas power plant capacity but CEO Markus Krebber criticised the government's hydrogen strategy still lacks vital details – particularly as time is really pressing now. "So far we only know the key points. Coordination with Brussels is still pending," he commented.

"As we need the capacity quickly, it must be ensured that it is actually built," Krebber stressed, adding RWE wants to realise H2-ready plants would "mainly" at the sites of its existing coal-fired power plants. "We are working on developments at sites not only in North Rhine-Westphalia, but also outside," he specified, noting RWE wants to build at least 3 GW by the end of 2030. ■

EPA considers scrapping H2 proposal from power plant pollution rules

US Environmental Protection Agency (EPA) has finalised two rules to tackle emission in the power sector, with the first one mandating all existing coal-fired plants that operate beyond 2039 to capture 90% of CO2 emissions. New combined-cycle gas power units will have to adhere to the same limit, so the EPA is effectively mandating the installation of carbon capture technology.

Coal power units scheduled to retire by 2039 are subject to less strict standards but still have to capture some emission, while coal plants that are set to be phased out by 2032 are unaffected. The second rule tightens the EPA's mercury and air toxics standards, pushing up the standards for toxic metals by 67% and lowering the limit for mercury for existing lignite-fired power units by 70%.

In May, the EPA had announced to also limit the emissions from existing gas-fired

power station. But after stark warning from the industry and grid operators that this regulation could incur power shortages, the EPC conceded to tackle the issue in a separate rulemaking at a later date.

"Finalizing these rules today is a huge step forward in our whole agency's approach to safeguard and public health by mitigating the harmful effects of power plant and industrial air pollution," EPA administrator Michael Regan commented.

Fierce criticism was voice from utilities and the energy-intensive industry. Rich Nolan, CEO of the National Mining

Association, claimed that through the latest rules, "the EPA is systematically dismantling the reliability of the U.S. electric grid." He accused the Biden administration of "ignoring our energy reality and forcing the closure of well-operating coal plants that repeatedly come to the rescue during times of peak demand." ■



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to herald investment of \$10 billion over the following four years. Various energy deals were even expected to amount to a total investment of up to \$27 billion. But a spat over the ownership structure of the Gas Growth Integration Project (GGIP), set up to tap Iraq's resources, had threatened to derail the cooperation altogether.

Iraq finally agreed to reduce its stake in GGIP to 30%, less than the 40% it had wanted initially but still more than the 25% initially conceded by the French oil and gas

group. Total now has a 45% stake in the project, while QatarEnergy joined as a third partner with 25%.

Infrastructure developments under the GGIP focus on avoiding wasteful flaring of associated gas from several oil fields and use that gas to run power stations instead, helping to avert frequent fuel shortages and blackouts. Contracts also stipulate treating seawater and inject it into oil reservoirs to boost upstream production, avoiding the use of scarce fresh water. ■

Ayala affiliate looks for partner for 1.1 GW Batangas gas power project

ENEX Energy, an affiliate of the Philippine conglomerate Ayala Corp, is seeking an additional partner to develop the 1,100 MW Batangas Clean Energy project. A joint venture between ENEX and Blackstone's Gen X Energy awaits a 'competitive selection process' to secure a firm power purchase agreement with Meralco, with the PPA deemed essential to get project financing.

Securing firm purchase agreements for a substantial part of the electricity output from the Batangas gas power project is a precondition for project partners to obtain debt financing from commercial banks. Time is pressing as construction is meant to commence this year for the plant to start operations by 2025.

Situated in the Batangas Bay area, close to Metro Manila, the power project would be fuelled by LNG from a nearby regasification plant and clean-burning hydrogen, once

available. Enex has been trying to advance the project though Batangas Clean Energy Inc (BCE), a 50:50 joint venture with Singapore-based Gen X Energy. Yet, costs to develop the CCGT amount to an estimated 60 billion Philippine Pesos (US\$1.08 billion), with a substantial part meant to be covered by debt.

Seeking additional partner

Now, ENEX seems to be scouting for an additional partner, possibly with enough cash at hand to get parts of the project financed through equity. "We ... continue to explore bringing in the right partner or sponsor," ENEX chairman Eric Francia said, without elaborating on the specific stake ENEX is looking to divest.

The current project partners had been strug-

gling to raise necessary capital and offtakers to sign firm sales and purchase agreements (SPAs). "We are not yet in financial close. We would like the project to win a long-term contract," Francia said earlier, admitting: "It is very risky to invest in a merchant, uncontracted gas power plant."

Funding is meant to come from various parties, he said, "notwithstanding the fact that ACEN will not be the source of construction equity." In terms of electricity offtake, he underlined the gas-fired power plant would need a contract with "a reasonable pass-through mechanism" to shield against the volatility of fuel prices.

The Philippines' Department of Energy (DoE) has ranked the 1,100 MW Batangas Clean Energy venture as an "energy project of national significance" due to its substantial nameplate capacity as it could cover up to 10% of demand in the Luzon power grid.

Electricity traders and energy suppliers in Luzon will be closely monitoring whether the plant is likely to come into operation in the third quarter of 2026, as planned. Any delays could cause power shortages during peak hours and push up the cost of electricity on the spot market. ■



Render of Batangas Clean Energy Inc.

Enel's missed targets trigger step-up of sustainability-linked bonds

Enel's failure to meet one of its sustainability performance targets (SPTs) has triggered a 25bp step-up in related bonds, Fitch Ratings pointed out. Scepticism grows towards sustainability-linked bonds (SLBs), while financial costs associated with the coupon step-up are also "substantial." The Italian utility had issued five bonds that include a target to reduce Scope 1 emissions intensity from power generation in 2024.

"The fact that the target was missed demonstrates that it was ambitious in the first place," analyst conceded, noting this "creates a reference point that other issuers who wish to demonstrate notable sustainability goals could mimic."

Fitch said it reviews Enel's ESG framework ratings covering affected bonds to determine implications for the utility's wider rating, which in turn greatly affects

its conditions to raise debt finance. The SLB bonds had been agreed to by commercial banks in the belief Enel would cut its emission from coal- and gas-fired power generation, as promised. However, delays with retrofits for post-combustion carbon capture or hydrogen co-firing as well as scarcity of clean-burning fuels have contributed to the missed targets.

Critics of sustainability-linked bonds in recent months had lambasted their shortcomings in materiality and level of ambition. Others noted the target observation date for some SLBs is set close to the bond's maturity, which means the penalty incurred by the step-up mechanism in the event of a missed target does not present a material incentive to meet the target.

Enel has an outsized role in the SLB market, being both a pioneer in issuing labelled debt in this format and the largest, most prolific, corporate issuer globally. "It will continue to face scrutiny as deadlines to meet other targets fall due," Fitch analysts commented. They referred to Enel having issued a sustainability-linked debt, linked to targeted emissions reduction with an observation date set for 2025. ■



Energy storage helps lower power prices, reduces need for gas

Storage participation in the German wholesale power market could lower prices by €1/MWh between 2030 and 2050. By storing excess renewable energy, utilities can avoid having to build an additional 9 GW of new gas-fired power plants, a study commissioned by Fluence finds – though only grid-forming storage can provide inertia and system strength.

If no batteries get added and the missing capacity is not replaced by additional new gas plants, the wholesale prices would rise by €4/MWh, modelling by Frontier Economics finds. Battery-based energy storage in Germany is expected to increase fortyfold by 2030, reaching 57 GWh with a connected capacity of 15 GW.

Storing surplus wind and solar power on a large scale would ease pressure to invest in new gas fired power plants. Germany needs to develop approximately 26 GW of new gas-fired power plants by 2030 – but without deploying storage as forecast in the model, at least an addition 9 GW of new

gas-fired power capacity would be needed.

Storage build-out needs no gov' funding

"Grid-scale storage systems can be built without government funding and can reduce the need for construction of new hydrogen-ready gas power plants as well as their fuel usage," said Dr. Christoph Gatzen, Director at Frontier Economics. Ensuring investment security for storage and green generation assets, in his view, "should be a priority for policymakers."

By 2050, the capacity of large-scale batteries installed to store surplus renewable energy in Germany could reach 60 GW / 271 GWh.

Rapid build-out is driven by rising demand for flexibility services to help balance the grid and falling costs of storage technology.

Dr. Gatzen

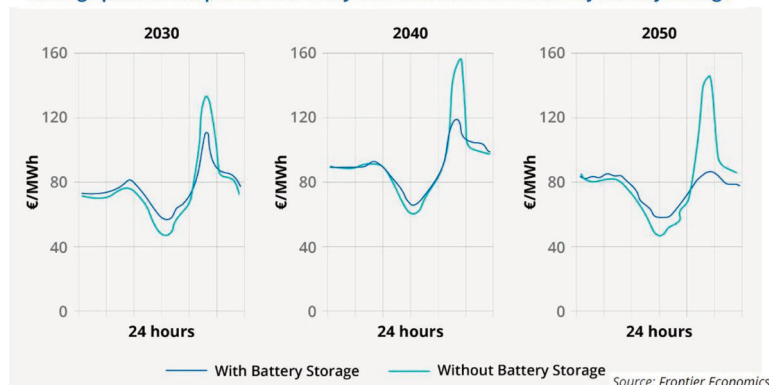
views large-scale batteries as system critical for the energy transition: "Without the flexibility provided by storage, the country will face higher economic costs caused by increasing gas imports and expensive curtailment of renewable generation," he explained.

Potential for €12bn in added economic value

Using storage to shift the availability of electricity from times of surplus generation to times of electricity shortages can generate a macro-economic value of around €12 billion by 2050. Frontier Economics estimated that value based on savings from the wholesale markets alone and noted it would increase further benefits of storage for load balancing and flexible power supply on intra-day markets are factored in.

"Using large-scale storage instead of gas-fired power plants could limit CO2 emissions by 6.2 million tonnes by 2030 and lower wholesale electricity price by €1/MWh on average between 2030 and 2050," Gatzen pointed out, adding: "If no energy storage is built and the missing capacity is not replaced by additional new gas plants, the wholesale prices would rise by €4/MWh." ■

Average price development over a day with and without stationary battery storage



Gas peakers vital to meet India's 8% higher power demand this summer

Fitch Ratings expects India's electricity demand to rise by 8% year-on-year in the second half of this year, spurred by industrial growth and above normal summer temperatures. Higher dispatch of gas peaking power stations is deemed vital to meet demand, particularly as the government aims for 500 GW of non-fossil capacity to reduce emissions by 1 billion tonnes by 2030.

Intermittent wind and solar power capacity is accounting for a fast-growing share of India's power mix as the government strives to lower the emissions intensity of GDP by 45% and commits to net-zero by 2070. To reach this goal, non-fossil power sources will have to rise from currently under 44% to over 65% by the end of the decade.

IGX launched dedicated gas contracts

To address flexible demand, the Indian Gas Exchange (IGX) has launched natural gas contracts for power generators with three delivery options: The exchange offers weekly, fortnightly and monthly gas delivery as well as a fixed gas price for the duration of the contract, with delivery points includ-

ing the Dahej and Hazira LNG terminals.

The flexible contracts seek to ease trading with flexible delivery options that allow utilities to consume the entire quantity on any day during the contractual period. The IGX will also take steps to add more LNG terminals as delivery points, based on demand. The new contract "should be able to help run gas-based power plants by sourcing gas from IGX at competitive prices," said Ghanshyam Prasad, chair of the Central Electricity Authority (CEA).

Gas-burn in the Indian power sector is expected to soar substantially this year, with overall electricity demand having



NTPC's Jhanor Gandhar gas power station

reached 241 GW last year and expected to hit 255 GW this summer. According to Rakesh Mendiratta, CEO of IGX, forward power prices already touch Rs 10/kWh for most of the summer period, hence gas prices of less than \$10/MMBtu will help boost gas use in the power sector. ■

JERA and IHI start world's first 20% ammonia co-firing trial

Demonstration testing has kicked off for the world's first 20% ammonia co-firing test at the utility-scale Hekinan power plant in Japan. Plant operator JERA secured 40,000 tons of grey ammonia from Mitsui for the trial, which is scheduled to run through June 2024 as IHI investigates the impact of ammonia combustion on boiler heat absorption and exhaust gases.

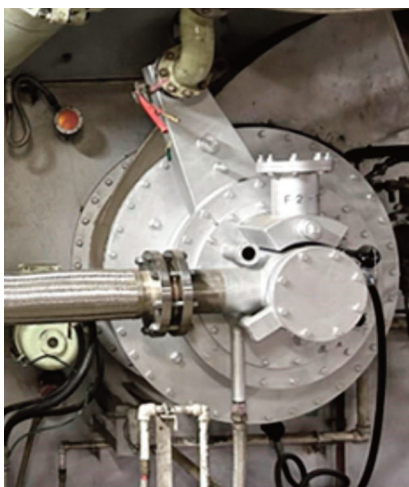
With an installed capacity of 4,100 MW, Hekinan is the largest coal-fired power station in Japan, consisting of three 700 MW units and two 1,000 MW units. Co-firing tests focus on Unit 4, commissioned in 2001 and equipped with a turbine and generator from Toshiba and a boiler from IHI. Starting from last year IHI has developed a test burner at Hekinan Unit 4 based on the results of small-volume testing of fuel ammonia at Unit 5.

The trial had been initially planned to start to by March 26, but JERA pushed back this date until the start of May as it needed more time to test run the related equipment. Now, ammonia co-firing tests will scrutinise overall plant characteristics and potential operability issues, and look on the impact on boilers and ancillary equipment.

Aiming for full NH₃-capable gas turbine by 2030

Going forward, IHI wants apply the knowledge gained from the demonstration at Hekinan Unit 4 for developing technology for 50% or more ammonia co-firing as well as burners for 100% ammonia combustion.

In January, IHI teamed up with GE Ver-



Test burner and fuel tank at Hekinan Unit 4

nova to develop a new gas turbine combustor capable of using ammonia (NH₃) as a viable fuel option for power generation compatible with GE Vernova's 6F.03, 7F and 9F gas turbines. IHI and Petronas affiliate Gentari Hydrogen earlier agreed to commercialise IM270 – a small-scale, fully ammonia-fuelled turbine – by 2026.

Ammonia (NH₃), a derivative from hydrogen (H₂), emits no carbon dioxide (CO₂) when burnt but the fuel as an inherently lower flammability which makes it harder to combust than natural gas. Moreover, critics

warn that that nitrous oxide (N₂O) is susceptible to form during NH₃ combustion, which has a greenhouse warming effect around 300 times that of CO₂.

IHI has been piloting its ammonia combustion technology in Japan. Tests at a new combustor on the 2,000-kilowatt-class gas turbine at IHI Yokohama Works, achieved a greenhouse gas reduction rate of over 99%, even when the ammonia fuel ratio is at 70~100%, and IHI already verified the output of 2,000 kW (2 MW) when mono-firing liquid ammonia. ■

Mitsubishi and NGK strive to purify hydrogen after ammonia

To facilitate high-volume of hydrogen via ammonia, Mitsubishi Heavy Industries (MHI) and NGK Insulators are developing a system to purify hydrogen after the ammonia cracking process. 'Membrane separation' hereby acts as a filter which only allows pure hydrogen to pass, whilst nitrogen and residue ammonia gets blocked so that end-users, notably power generators can co-fired high purity hydrogen.

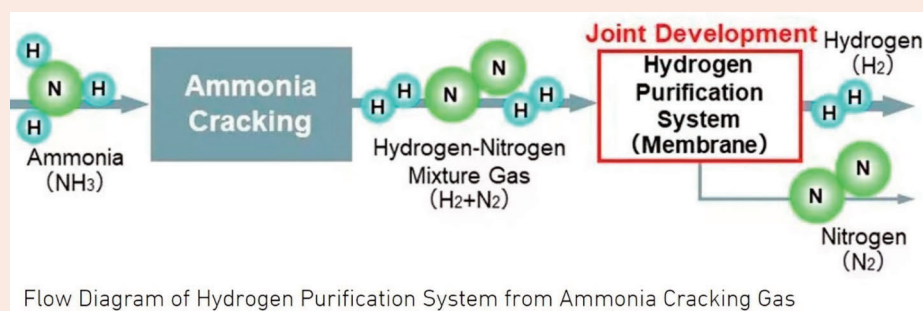
Purity requirements need to be observed when using hydrogen in fuel cells as well as for combusting it in hydrogen-ready gas turbines. Otherwise, both the lifespan of the equipment and its operational efficiency are adversely affected.

Vowing to build an "optimal system for purifying hydrogen," MHI will contribute its expertise delivering ammonia plants while NGK will contribute its knowledge of sub-

nano ceramic membrane technology and unique film deposition. Both partners aim for early commercialization of the membrane separation technology as demand for clean fuels is picking up.

Ammonia, in particular, is attracting attention as a carrier to safely store and transport clean-burning hydrogen. Efforts to set up supply chains are underway worldwide, notable in Europe while Japanese companies are pursuing a 'Fuel Ammonia Supply Chain Establishment' project.

By commercialising a membrane separation hydrogen purification system, MHI and NGK want to help build ammonia and hydrogen supply chains as power generators are mandated to decarbonise further. The research project also aligns with MHI Group's goal of achieving carbon neutrality by 2040. ■



Mitsubishi Power starts operation of third unit at Thai power plant

Mitsubishi Power, part of Mitsubishi Heavy Industries, has completed construction and commenced operations for the third M701JAC unit out of four at a gas-fired power plant in Rayong province in Thailand. Situated some 130 km south-east of Bangkok, the plant is a joint venture between Gulf Energy Development PCL, Thailand's largest independent power producer, and Mitsui & Co.

The overall Rayong project consists of two GTCC power plants, each comprising four gas turbine units, steam turbines, heat recovery steam generators, and generators. All eight units are anticipated to be fully operational by fall 2024.

The recent start-up of Unit 3 marks Mitsubishi's timely delivery of seven out of eight M701JAC units across two ultra-large-scale 2,650 MW combined-cycle power plants in Rayong and Chonburi, with a collective output of 5,300MW. The four

M701JAC units installed at the Gulf Sriracha power plant, along with the two units in Rayong Province, are currently operating smoothly and have exceeded 75,000 actual operating hours (AOH).

Committed to help meet Thailand's energy demand, Mitsubishi Power has also begun operations of one of two M701JAC gas turbines in a 1,400 MW gas-fired power plant by Hin Kong Power Company, a special purpose company jointly established by RATCH Group and Gulf Energy Development. Completion and full operation of the second unit is scheduled for January 2025.

"Having been part of Thailand's energy story for more than five decades, we are honoured that our robust GTCC solutions have helped to enhance the reliability and efficiency of Thailand's energy infrastructure," commented Akira Takahashi, managing director of Mitsubishi Power (Thailand). ■



Rayong combined-cycle plant on Thailand's east coast

JERA annual profits to halve on lower revenues from power generation

Japan's largest LNG importer and power generator JERA is anticipating profit for the fiscal year ending March 2025 will halve down to 200 billion yen (\$ 1.3 billion) as less revenue comes in from its overseas power generation business. The time lag in the fuel price adjustment mechanism, however, works in its favour.

Power producers tend to purchase thermal coal and natural gas for decades in advance, with the latter often linked to Brent oil prices. And as oil prices have come down from recent highs, the price of natural gas is easing – albeit with a time lag of three to six months, dependant on contractual arrangement.

JERA, owned by Tokyo Electric Power and Chubu Electric Power, reaped 399.6 billion yen (\$2.55 billion) in profit for the year

ended March 31, versus tiny profits of 17.8Bln yen (\$113.6 million) in the 2022-2023 fiscal year amid Japan's fuel price adjustment and time lag system.

In fact, net profits increased mainly due to the time lag in fuel price adjustment system, as it shifted from losses to gains, the utility explained. In addition, there was also an improvement of profit-loss on valuation of contracts for coals etc., despite the impact on the fuel procurement price, the impact of fuel inventory unit prices and the decrease in profit from the fuel business.

"Profit excluding time lag was 148.7 billion yen (\$949 million)," said JERA disclosed which prides itself to owns the entire supply chains for fuel and thermal power generation, from the fuel upstream to transportation and storage) to power generation and wholesaling. ■



Aksa to build 500 MW plant in Kazakhstan

Aksa Enerji, the largest listed power producer in Turkey, has signed an agreement with the Kazakh government to build a combined-cycle gas power plant with a capacity of 500 MW, a filing with Borsa Istanbul reads. Award of the order comes amid Aksa's efforts to convert a cogeneration plant from coal to gas to help Kazakhstan decarbonise.

Timeline for construction and start-up as well as the location of the CCGT has not been disclosed, nor any details on financing.

In early March, Aksa Enerji obtained a loan for modernising the two gas-fired power stations in Uzbekistan. Bayern LB agreed to contribute debt financing for Aksa's works on the 230 MW Tashkent and 270 MW Bukhara gas-fired power stations, with the upgrade envisaged to enhance the plant's capacity by around 50 MW.

For the repowering of a 240 MW combined heat and power (CHP) project in Kyzylorda, Kazakhstan, meanwhile, Aksa has ordered two GE 6F.03 gas turbines and is striving to get the converted plant operational in 2025. The ageing energy infrastructure of the Central Asian nation heavily relies on coal, so the flexible CHP will balance renewables to help Kazakhstan decarbonise.

Kazakhstan is making progress to improve grid stability and is committed to modernize its power infrastructure as part of the government's long-term objective to reach net-zero carbon emissions by 2060. Aksa Enerji vice chairman Korkut Ozturkmen vowed the Turkish utility is "dedicated to support Kazakhstan's energy transition through transforming its coal baseload to lower carbon footprint technologies." ■



Aksa-built power plant

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