

# **WORLD POWER SYSTEMS REVIEW**

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## **18 MW Offshore Wind Turbine Launches in China**

The H260-18MW has a rotor diameter of 260 metres and an individual capacity of 18 MW, making it the largest and the most powerful wind turbine currently on the market or under development.

The model took the top spot from MingYang's MySE 16.0-242 wind turbine and the 16 MW model jointly developed by China Three Gorges Corporation and Goldwind Technology. According to CSSC, 80 per cent of the turbine's components have been sourced from within the group, including the major components such as the blades, the gearbox, and the generator. This localised approach has been implemented in order to avoid possible supply chain bottlenecks, the company said.

The H260-18MW has a sweep area of 53,000 square metres, equivalent to around seven standard football pitches. At full wind speed, 44.8 kilowatt-hours of electricity can be generated per revolution, and a single unit will be able to produce more than 74 million kilowatt-hours of clean electricity per year, which can meet the annual electricity consumption of 40,000 households, the company said. A 1 GW wind farm would feature 13 per cent less wind turbines if the H260-18MW units were used instead of a 16 MW model, according to CSSC.

[Offshorewind.biz](http://www.offshorewind.biz)

[http://www.offshorewind.biz/](http://www.offshorewind.biz)

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## **Turbine collapses at Dutch wind farm**

A turbine at a Vattenfall-operated wind farm in the Netherlands has collapsed.

Local fire services attended the incident at the 18MW Eemmeerdiijk wind farm, which saw the upper portion of the unit break off. "On January 4, close to eleven in the morning, one of the turbines of wind farm Eemmeerdiijk collapsed," Vattenfall spokesperson Robert Portier told renews.

"Blades, nacelle and the top part of the mast broke off and landed on grassland, the service road and the slope of the adjacent dike. No one was hurt and there was no danger for traffic using the road on the dike. "Yesterday, Vattenfall started removal of the debris, which will be stored for further investigation. All other turbines have been stopped and have been set in safe position."

The wind farm utilises 55-metre-tall two-bladed turbines with a rating of 0.8MW. These were supplied by no-longer trading company OEM NedWind. According to local Dutch newspaper NL Times, a weather warning was in effect on Wednesday 4 January due to strong winds.

[Renews.biz](http://renews.biz)

<http://renews.biz/>

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## **Hwange Power Station expansion project, Zimbabwe's largest power station**

According to Zhemu Soda, energy and power development minister, Zimbabwe is scheduled to commission the first new 300MW generation unit at Hwange Thermal Power Plant this month. The unit would boost the output of the country's largest thermal power station by a total of 600 megawatts.

Engineers from China and Zimbabwe are completing final testing before commissioning according to Soda. He said that work on the protection system, is now being finalized by the engineers. The protection system would allow the evacuation of electricity

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from the unit to the grid. Soda added that the power plant's testing had been carried out and was successful. All that is left for them to do is test the protection system that allows the delivery of electricity to the transmission system.

The commissioning of the first 300MW generation unit was initially scheduled to take place in December. It is said that the commissioning was postponed due to the Chinese engineers' delayed arrival. The engineers just came into the country in mid-December, when they were initially expected in November. The minister added that there was also a delay in their comprehension of all the systems. He also said that they are currently expecting them to conclude the test in the next three weeks. According to him, the plant will be operational by the end of this month. The unit is projected to have a 300 MW output.

Additionally, unit 8, which is currently under construction will have a similar capacity. It is expected to be operational by the end of March. Following the commissioning of the two units, ZESA aims to begin extensive rehabilitation of the power station's existing units in order to restore their capacity to 930 MW, which is expected to alleviate Zimbabwe's electricity shortages.

Hwange power station is located at Hwange in the Matabeleland North Province of western Zimbabwe. With an installed capacity of 920 MW, the facility is the biggest power plant in the South African country. Owned and operated by the national electricity company Zimbabwe Electricity Supply Authority (ZESA) has been operational since 1983. Hwange power station was built in two stages and consists of 4 units of 120 MW each and 2 units of 220 MW each. Construction of the first stage units began in 1973, which were commissioned from 1983 to 1986, and was followed by second stage units in 1987.

Due to deterioration, the plant was only capable of generating 327MW. This necessitated a rehabilitation and expansion project in a bid to increase the facility's capacity. The project attained National Project Status in 2011. It is being implemented by ZESA through its special purpose vehicle Hwange Electricity Supply Company (HESCO). The authority is collaborating with the Engineering, Procurement Construction (EPC) contractor, Sinohydro Pvt Limited of China.

The at least US\$ 1.5bn expansion project involves the installation of two additional coal-fired units (units 7 and 8) of 300MW capacity each. The main equipment for these units is provided by China's state-owned electricity equipment manufacturer Dongfang Electric Corporation. The project is being undertaken concurrently with the upgrading and rehabilitation of the Deka pumping station. The station will supply the water required at HPS for the installation and commissioning of the two new power generation units.

Scheduled for completion in 2022, the Hwange power station expansion project will increase the plant's capacity to 1,520MW.

*Construction Review Online*  
<http://constructionreviewonline.com/>

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## **Julius Nyerere Hydropower Station project timeline all you need to know**

Julius Nyerere Hydropower Project in Tanzania has advanced to the next phase of development. This comes a short while after President Samia Suluhu Hassan presided over the opening of the diversion channel that would direct water into the dam.

The volume of water diverted into the reservoir, which is required for the generation of electricity, makes the diversion important. Energy Minister January Makamba stated that the dam is 78% complete. He disclosed this while he was speaking on the construction site.

The largest hydropower project in the region's opening of the diversion channel, according to Mr. Makamba, is an important step toward starting to fill the dam with water and produce electricity. According to him, the dam, which will be used to generate water for

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the project, measures roughly 916 km<sup>2</sup>. Given its massive size, he continued, it will be more of a lake than a dam. He claimed that the Egyptian contractors, Elsewedy Electric Ltd. and Arab Contractors, have already been paid Tsh 4.5 trillion (\$1.92 billion) by the Tanzanian government. President Samia's opening of the diversion channel marks a huge milestone forward in the project's implementation. The remaining step is to switch on the turbines so that power generation can begin later.



Julius Nyerere Hydropower Station; the largest in the East African Community (EAC) is a US \$2.9bn project being constructed across the Rufiji River in eastern Tanzania. The station is expected to have an installed capacity of 2,115MW and will produce 5,920GWh of power annually. The power generated will be evacuated via a new 400kV high voltage power line to a substation where the power will be integrated into the national electricity grid.

The 134 metres (440 ft) arched, concrete dam is expected to create a reservoir lake, 100 kilometres (62 mi), in length, measuring 1,200 square kilometres (460 sq mi), with 34,000,000,000 cubic metres (1.2×10<sup>12</sup> cu ft) of water. The project is owned and will be managed by the government owned Tanzania Electric Supply Company (TANESCO). It is expected to enhance access to affordable electricity which will propel economic growth as well as attract investment in the country. It will also transform the country through generation and supply of reliable electricity for both domestic and industrial use.

The government of Ethiopia is advising the Tanzanian government on the implementation of this project. Construction of the fourth largest power station in Africa is expected to be completed in 2022.

The Julius Nyerere Hydropower Station project has received criticism from environmental experts because the location of the gorge is in the middle of the Selous Game Reserve World Heritage Site. Conservationists are opposed to this project saying it threatens the endangered animal species in the area especially the black rhinoceros and elephants.

*Construction Review Online*  
<http://constructionreviewonline.com/>

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## **Egypt signs deal for construction of 1,000-MW worth of Solar and Wind Power**

Renewable energy company AMEA Power Ltd. has announced the financial close for the two major clean energy projects in Egypt, making way for construction to begin. The two projects, the 500MW Abydos solar plant located 600km south of Cairo in Aswan governorate and the 500MW Amunet wind farm 318 km south of Cairo in the Red Sea governorate will

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be built, owned and operated by the fully owned subsidiaries of the United Arab Emirates-based AMEA Power—Abydos Solar Power Co. and Amunet Wind Power Co.

Although AMEA Power could not confirm when the projects would break ground, the company expects to bring the solar photovoltaic (PV) plant online in the first quarter of 2025 and the wind farm in the second quarter of 2025. Completion of these two projects would increase AMEA Power's clean energy projects in Egypt to 2 GW. The projects are driven partly by the declining costs for renewable power technologies.

"These landmark projects reflect the long-term commitment, ambition and growth of AMEA Power," says Hussain Al Nowais, chairman of AMEA Power. IFC's regional director for North Africa and Horn of Africa Cheick-Oumar Sylla says the two renewable projects "highlight the private sector's essential role helping to deliver clean, affordable power, especially at a time of growing challenges from climate change and pressures on the environment.

"Egypt has ambitious renewable energy goals, and we are proud to support AMEA's expansion into Africa as well as its partnership with Egypt to accelerate the country's renewable energy transition," adds Sylla. Financing for the Abydos PV plant has been provided by World Bank Group's International Finance Corp. (IFC), Dutch Entrepreneurial Development Bank, Japan International Corp. Agency (JICA). The wind farm project developer is a partnership with Japan-based investment giant Sumitomo Corp. Funding has been provided by Japan Bank for International Cooperation, IFC, Standard Chartered Bank and Commercial International Bank.

Sumitomo Mitsui Banking Corporation and Sumitomo Mitsui Trust Bank are participating in the project as co-lenders under the Nippon Export & Investment Insurance. The financing covers construction of transmission infrastructure, technical assistance to support Egypt's renewable energy expansion program as well as the development and construction of the solar photovoltaic and wind plants. In December 2019, Egypt Electricity Transmission Co. signed power purchase agreements with the two AMEA Power subsidiaries while the nation's New & Renewable Energy Authority finalized agreements for development of the two clean energy facilities. Currently, Egypt's renewable energy installed capacity is estimated at 3.7 GW including 2.8 GW of hydropower and around 0.9 GW of solar and wind power providing an estimated 6,000 jobs to date. Egypt had set renewable energy targets of 20% of its electricity mix by 2022 and 42% by 2035.

*Engineering News-Record*  
<http://www.enr.com/>

**7 January 2023**

## **Laos launches 500 kV transmission line and plans to connect to Cambodia**

Yunnan Energy Investment (HK) Co Ltd has launched a 500 kV transmission line in the southern Lao province of Champasak and connected to a substation in Khong district on the Cambodian border. Coming to Cambodia soon too. This is according to Laos' Vientiane Time newspaper, published on January 5, 2023.

Mr Chanthaboun Soukaloun, Managing Director of Electricite du Laos (EDL), said the 500-kilovolt transmission line and substation project was the first of its kind in Laos, with a budget of more than \$ 150 million. United States by Yunnan Energy Investment (HK) Co Ltd. The transmission line project is more than 200 kilometers long, running through Khong district of Champasak province and Sanam Say district, and Phu Vong district of Attapeu province, Laos. It should be noted that this project has become an important achievement in the context of Laos' strategy to export electricity to neighboring countries, especially Cambodia. Laos currently has several hydropower projects built as part of the government's strategy to turn its country into an ASEAN energy bloc. As of 2020, Laos has 82 power



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sources with a combined capacity of about 10,000 megawatts. Of that, 80.4% of the total energy comes from hydropower and 18.6% from coal-fired power plants.

*Construction Property*

<http://construction-property.com/>

## **Reforms outlined for Britain's capacity market to secure a clean energy future**

UK government outlines important proposals to reform Great Britain's Capacity Market, ensuring it is fit for a net zero future while ensuring the security of our electricity supply. Reforming Britain's Capacity Market to secure a clean energy future.

- Consultation launched to reform GB's Capacity Market, the government's main mechanism for ensuring security of electricity supply
- proposals will improve the robustness of the energy supply and provide greater incentive for investment in low carbon technologies central to homegrown energy
- this consultation is a step in the government's long term plan to enhance energy security and deliver a net zero power system

Improved energy security and a more secure transition to net zero are set to be delivered through the UK government's significant proposals to reform Great Britain's Capacity Market (CM). The Capacity Market is the scheme that sits at the heart of the government's strategy for ensuring security of electricity supply in Great Britain, using competitive auctions to make sure there is enough reliable capacity to meet Great Britain's peak electricity demands, safeguarding against the possibility of future blackouts.

Since its introduction in 2014, the landscape in which the Capacity Market operates has shifted with renewable energy now making up a significant proportion of our electricity generation system. To ensure the Capacity Market is fit for the future, the government is today publishing action plans to ensure the scheme keeps pace with this transition to cleaner energy sources and technologies – often cheaper than fossil fuel counterparts - and can support the delivery of a decarbonised power system by 2035, without compromising security of supply.

This includes consulting on new contracts for low carbon technologies to incentivise their participation in CM auctions, creating new timelines and requirements for oil and gas generators to reduce emissions from 2034, such as through implementing carbon capture and hydrogen to decarbonise and reducing running hours, and strengthening the scheme's ability deliver security of supply in times of electricity system stress.

Through competitive auctions between technologies such as batteries and gas-fired generators, the Capacity Market secures the capacity needed to cope with future demand peaks at least cost to consumers. Innovative technologies, such as batteries, are playing an increasingly important role in keeping the lights on across Great Britain. New technologies, such as Carbon Capture, Utilisation and Storage (CCUS) and hydrogen power and storage, are expected to come online over the coming decade, as the UK continues to lead the world in decarbonising. To accommodate this, the government is setting out today the following proposals to reform Great Britain's Capacity Market.

Incentivising greener, flexible technologies to compete in CM auctions by offering multi-year contracts for low carbon flexible capacity, such as smart 'demand side response' technologies and smaller-scale electricity storage, supporting the move towards delivering secure, clean and affordable British energy in the long term.

Ensuring a clear pathway for carbon intensive forms of capacity as the UK transitions to net zero and the capacity mix of the CM diversifies, by sending a clear signal to oil and gas generators about the timelines and requirements for emissions reduction in the 2030s and seeking evidence on mitigating any barriers this capacity may face in decarbonising.

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Underpinning these efforts with a proposed new lower emissions limit in the Capacity Market which will kick in for new build plants from 1 October 2034, meaning all new oil and gas plants receiving long term agreements through the CM will be obliged to lower emissions, through decarbonising their capacity by introducing carbon capture, hydrogen and other low carbon methods into their generation and by reducing running hours.

Taking steps to strengthen the scheme's ability to deliver security of supply by reforming the CM's approach to performance testing to ensure confidence as early as possible in the winter that capacity is available and strengthening the non-delivery penalty regime to send a clear signal that capacity must deliver in times of electricity system stress.

Today's announcement forms part of the government's work to reduce the UK's exposure to volatile global gas markets and energy costs for consumers in the long term as part of the Review of Electricity Market Arrangements (REMA). The government continues to seek views on a wide range of energy reform options, with an update on REMA expected early this year.

Following the consultation period, the government will outline the final plans for reform and implementation. Capacity market auctions held to date have secured the majority of Britain's capacity needs to meet forecast peak demand out to 2025 to 2026.

There are 4 key delivery partners within the CM: The Department for Business, Energy and Industrial Strategy (BEIS) who have overall ownership of the CM, Ofgem who ensure the market arrangements are working, the National Grid Electricity System Operator (NGESO) who advise on targets and requirements and oversee agreement management, and the Electricity Settlements Company (ESC) who oversee the payment process.

Summary of the government proposes

Strengthening security of supply

- Strengthening the non-delivery penalty regime to send a clear signal that capacity must deliver in times of electricity system stress.
- Reforming the CM's approach to performance testing to ensure we can be confident as early as possible in the winter that capacity is available and ready to deliver.
- Reforming the way that connection capacity is assessed in the CM, to ensure a higher degree of accuracy in assessing how much power a generator, battery or demand side response unit can provide to the network.
- Enabling plants that have been mothballed can enter the CM and provide capacity, with additional safeguards in place to ensure these plants are capable of delivering capacity.

Aligning the CM with net zero

- Introducing a new lower emissions intensity limit in the CM from 1 October 2034 for future agreements – this will send a clear signal to new build carbon intensive capacity to lower emissions either by decarbonising or reducing running hours. Agreements under the existing rules stand unchanged.
- Reviewing the CM's capital expenditure thresholds to ensure that eligibility criteria for accessing multi-year CM agreements remains fit for purpose as the capacity mix of the CM decarbonises.
- Incentivising increased participation in the CM from low carbon flexible capacity by enabling low carbon capacity with low capital expenditure to access multi-year agreements of 3 years without being required to meet capital expenditure thresholds.
- Seeking stakeholder views on barriers to decarbonisation during existing long-term CM agreements, including whether to create managed exit pathways to enable capacity to transfer to new agreements or alternative support mechanisms to decarbonise.

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- Evaluating the role government energy policy has in supporting projects with long build times and the relationship between the CM and wider government support for large-scale long-duration electricity storage (LLES).

Additional improvements to the CM

- Reducing administrative burdens for government and capacity providers wherever possible, and clarifying the mechanics of how auctions clear.

- Amending the existing route for certain projects to exit the CM to become eligible to bid in a Contracts for Difference allocation round so that the process works in practice.

- Introducing a phased approach to emissions verification to ensure administrative processes run smoothly in upcoming auction rounds.

The government will consider responses to this consultation and aims to publish a response in Spring 2023.

**GOV.UK**

<http://www.gov.uk/>

**9 January 2023**

## **Governor Hochul Announces Approval of Siting Permits for Three Major Solar Energy Facilities**

Governor Kathy Hochul today announced the New York State Office of Renewable Energy issued three siting permits that will deliver enough clean energy to power over 69,000 New York homes for at least 20 years. Today's announcement, when coupled with eight previously permitted facilities by the Office, marks the approval of 11 projects, totaling nearly 1.8 gigawatts since 2021. This marks the most rapid pace of renewable energy project approvals in state history. Including projects sited through the State Board on Electric Generation Siting and the Environment, New York has approved a total of 20 new renewable energy projects since 2021.

"Accelerating the development of renewable energy is a top priority to ensure we reach our climate goals, create jobs, and spur economic development across the state," Governor Hochul said. "We're cementing our position as a national leader in climate action, and these investments will help create a clean and healthy New York where future generations can thrive."

While meeting and exceeding all statutory deadlines, the New York State Office of Renewable Energy (ORES or the Office) decisions have demonstrated the effectiveness and efficacy of the permitting process for large-scale renewable energy projects in New York State as a model for addressing the most pressing existential crisis of our time - the threat of global climate change. Upon completion of extensive, transparent, and robust reviews of all 11 applications that included consideration of nearly 1,500 public and municipal comments, a majority of these energy facilities were approved within six months of applications being deemed complete.

Today's milestone underscores New York's leadership in the fight on climate change by accelerating the most ambitious state-led clean energy agenda in the nation, while also considering the protection of the environment and all pertinent social, economic, and environmental factors in the decisions to permit these facilities in a timely and cost-effective manner. Office of Renewable Energy Siting Executive Director Houtan Moaveni said, "The success of the § 94-c siting process is attributed to staff at ORES and its partner State agencies, as well as all involved stakeholders including local officials, community members, environmental groups, labor unions and the clean energy industry dedicated to building a cleaner, more resilient New York. This process stands as a regulatory model to make the

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clean energy transition happen efficiently and effectively to meet our carbon-emission reduction targets, while ensuring robust protection of our natural resources and consideration of all pertinent social, economic, and environmental factors."

Three siting permits, totaling approximately 309 MW of renewable energy capacity are:

- Homer Solar Energy Center (90 MW Solar Electric Generating Facility in the Towns of Homer, Cortlandville, and Solon, Cortland County);
- Tracy Solar (119 MW Solar Electric Generating Facility in the Towns of Orleans and Clayton, Jefferson County); and
- Riverside Solar (100 MW Solar Electric Generating Facility located in the Towns of Lyme and Brownville, Jefferson County).

These projects are expected to provide nearly \$20 million in the first 20 years to the host counties, towns, and school districts in the form of payment-in-lieu of taxes (PILOT) and host community agreements to invest in infrastructure, additional services, and resources for residents in the communities hosting each facility. Further, these projects are expected to spur over \$458 million in capital investment and create over 460 short- and long-term jobs in development, construction, and facility operations and maintenance. Once operational, these projects will add 542,000 megawatts of new renewable capacity annually, and are expected to generate enough clean energy to power more than 69,000 homes each year and reduce carbon emissions by more than 356,000 metric tons annually, the equivalent to taking over 76,000 cars off the road every year.

*The official website of New York State*  
<http://www.governor.ny.gov/>

**11 January 2023**

## **South African power cuts worsen as Eskom extends worst-ever outages**

South African power cuts worsened on Wednesday as struggling state utility Eskom said it would extend its worst-ever outages until further notice. The "Stage 6" power cuts mean six to eight hours a day without power for most South Africans and require up to 6,000 megawatts (MW) of capacity to be shed from the national grid. They are a major source of public frustration with the governing African National Congress party, whose support among voters is sliding, and a brake on economic growth in Africa's most industrialised nation. They are a major source of public frustration with the governing African National Congress party, whose support among voters is sliding, and a brake on economic growth in Africa's most industrialised nation.

Eskom has a nominal generation capacity of roughly 46,000 MW, but on Wednesday more than 23,000 MW of that was offline because of breakdowns or planned repairs. Eskom said in a statement that 11 of its generators had suffered breakdowns since Tuesday morning. The beleaguered utility supplies the vast majority of South Africa's electricity, relying mainly on an ageing fleet of coal-fired power stations that are unreliable and prone to faults.

*Reuters*  
<http://www.reuters.com/>

**11 January 2023**

## **Sun Cable enters voluntary administration – Strong development progress and portfolio provides opportunity for refreshed alignment between company and investor objectives**

Sun Cable Pty Ltd ("Company") has made the difficult decision to enter voluntary administration. The voluntary administration process will now unlock a path forward for the



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Company to access additional capital for continued development of its marquee project, the Australia-Asia PowerLink (AAPowerLink) and progress the next stage of its development portfolio in a strong market.

Christopher Hill, David McGrath and John Park of FTI Consulting have been appointed as voluntary administrators of the Company. The administrators have not been appointed to any of the Company's subsidiaries. The Administrators intend to work with the Company's management team and key stakeholders to determine appropriate next steps for the business. This will likely involve a process to seek expressions of interest for either a recapitalisation or sale of the business.

The appointment followed the absence of alignment with the objectives of all shareholders. Whilst funding proposals were provided, consensus on the future direction and funding structure of the company could not be achieved. Sun Cable continues to represent an outstanding strategic opportunity to operationally deliver the largest renewable energy project in the world, with the AAPowerLink project to supply power to the Northern Territory and Singapore, commencing late this decade. Sun Cable currently has a portfolio of a further 11 GW of proposed projects, which is equivalent to over 3 times that of the AAPowerLink.

Major milestones in the development of the AAPowerLink, include:

October 2022: Announced that Sun Cable is 50% over-subscribed for offtake interest in Singapore, having received Letters of Intent for ~2.5GW, versus planned supply of ~1.75GW.

November 2022: Identification in the Northern Territory of offtakers with around 30GW of renewable electricity demand, resulting in scope for further projects to be developed to serve this demand.

Government & regulatory approvals:

- 2019: Major Project Status from the Northern Territory Government
- 2020: Major Project Status from the Australian Government
- 2021: Placed on the National Infrastructure Priority List in Australia and deemed 'Investment Ready' by Infrastructure Australia
- September 2021: Indonesia announces preliminary route approval for the subsea cable.
- 2022: The Solar Project (Australia-Asia PowerLink) (Special Provisions) Act 2022 enacted, providing strong regulatory guidance and facilitation for the project in the Northern Territory.

*Sun Cable*

<http://suncable.energy/>

**12 January 2023**

## **Energy Crunch Turns Sweden Into Europe's Biggest Power Exporter**

Europe's energy crisis upended power trading last year, driving Sweden to become the region's top exporter after extensive outages in France's nuclear reactor fleet.

Sweden sent 33 terawatt-hours to other nations in 2022, making it the No. 1 exporter for the first time, according to Entso-E data analyzed by Rystad Energy AS. The UK flipped to being a net power exporter for the first time, and was joined by Spain and the Netherlands.

Power trading in Europe was roiled as Moscow squeezed gas supplies to the region and the struggles to repair France's aging nuclear plants turned the nation into the second-biggest importer. That crunch was eased by interconnectors that link national electricity grids, providing a safeguard against power outages.

*Bloomberg*

<http://www.bloomberg.com/>

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## **Changes to Swedish law proposed to enable nuclear new build**

A proposal to amend Sweden's legislation on nuclear power has been presented by Prime Minister Ulf Kristersson and Climate and Environment Minister Romina Pourmokhtari. The proposed changes would remove the current law limiting the number of reactors in operation to ten, as well as allowing reactors to be built on new plant sites, rather than just existing sites.

In October 2022, Sweden's incoming centre-right coalition government adopted a positive stance towards nuclear energy, with the Christian Democrats, the Liberals, the Moderates and the Sweden Democrats releasing their written agreement on policies - referred to as the Tidö Agreement. With regards to energy, the agreement said the energy policy goal is "changed from 100% renewable to 100% fossil-free". In the Tidö Agreement, it is assumed electricity demand of at least 300 TWh in 2045, double the current demand.

The parties called for the removal of prohibitions in the Environmental Code to allow new reactors in other locations than today and to have more than ten reactors in operation at the same time. The agreement said necessary regulations should be developed to create the conditions for the construction and operation of small modular reactors (SMRs) in Sweden. In addition, the permitting process for nuclear power plants must be shortened. The government has now formally proposed making amendments to the Environmental Code in order to achieve those aims.

The proposed legislative amendments will now be out for consultation for three months and the bill is expected to enter into force in March 2024. Sweden's six nuclear power reactors provide about 40% of its electricity. In 1980, the government decided to phase out nuclear power, but in June 2010 parliament voted to repeal this policy. The country's 1997 energy policy allowed ten reactors to operate longer than envisaged by the 1980 phase-out policy, but also resulted in the premature closure of the two-unit Barsebäck plant. In 2015, decisions were made to close four older reactors by 2020.

Ringhals 1 and 2 were closed at the end of 2020 and 2019, respectively - several years earlier than planned due to the economic impact of punitive taxes. In June 2022, Vattenfall announced it was initiating a pilot study to assess the conditions for proceeding with a decision to build at least two SMRs adjacent to the Ringhals plant. The study is expected to be completed by around late-2023 or early-2024.

"Sweden needs more electricity. Fossil-free, cheap electricity in the right place, at the right time. It is needed for the sake of jobs, competitiveness and the green transition," said Deputy Prime Minister and Minister for Energy, Business and Industry Ebba Busch. "Nuclear power is a necessary basis in the energy mix that builds the Swedish energy system strong again."

*World Nuclear News*  
<http://world-nuclear-news.org/>

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## **Kazakhstan slaps crypto miners with higher energy bills**

Cryptocurrency miners in Kazakhstan are paying more for their energy this year, as the government moves to encourage the use of renewables and curb the excessive electricity use that is contributing to shortages.

Under a new tax code that came into force on January 1, Astana introduced a sliding scale for a previously flat surcharge on energy use for cryptocurrency miners that first came into force last year. Last January, the miners began paying a surcharge of 1 tenge, worth

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about \$0.002, per kilowatt hour. A year on, some miners are paying up to 10 times more, NewTimes.kz reports.

The surcharge depends on the average price they pay to produce the coins over a given tax reporting period. The cheaper the electricity, the larger the surcharge. For example, if the producer pays 24 tenge, worth around \$0.05, or more per kilowatt hour, the surcharge remains at 1 tenge. If they pay 5-10 tenge, the surcharge will hit 10 tenge.

Cryptocurrency miners pay varying rates because they purchase spare capacity from power plants via auction. Those using renewables will continue to pay a flat rate of 1 tenge. President Kassym-Jomart Tokayev ordered the government to review the surcharge back in February 2022, when he said 1 tenge was a “pitifully small” amount for miners who are reaping large profits.

Crypto miners flocked to Kazakhstan from China in 2021 after Beijing banned operations there. Their power-hungry operations caused demand for electricity to balloon, leading to widespread blackouts. The government then started cracking down on illegal mining and increasing regulation over legal cryptocurrency operations. At that time, the sector was dominated by well-connected tycoons such as Bolat Nazarbayev, the brother of former President Nursultan Nazarbayev.

After the latter fell out of favor following violent turmoil in Kazakhstan last January, the government moved against Bolat Nazarbayev’s crypto-farms, which it implied were mining coins illegally. He “voluntarily” shut them down. Several other businessmen with links to the Nazarbayev family “voluntarily” closed their operations too. They included Kayrat Sharipbayev, who is believed to be the partner of Dariga Nazarbayeva, the ex-president’s eldest daughter.

Investigators said then that crypto mining presented a “threat to the country’s economic security”. The changes to electricity payments for crypto miners are the latest step by Astana to tackle that through greater regulation.

[Eurasianet.org](http://eurasianet.org/)  
<http://eurasianet.org/>

**12 January 2023**

## **PJM generators face up to \$2B in penalties for failing to run during December’s Winter Storm Elliott**

PJM was prepared for Winter Storm Elliott, which brought record-setting low temperatures to parts of the East Coast for a roughly three-day period starting on Dec. 23, according to Bielak. The grid operator issued a cold weather advisory for its Western region on Dec. 20, followed by a cold weather alert for the region a day later and another alert for its entire footprint on Dec. 23. PJM operates the grid from New Jersey to Illinois. Based on generator availability data it received from power plant operators, PJM thought it had a 29-GW reserve for Dec. 23, up from a typical 3-GW reserve, according to Bielak.

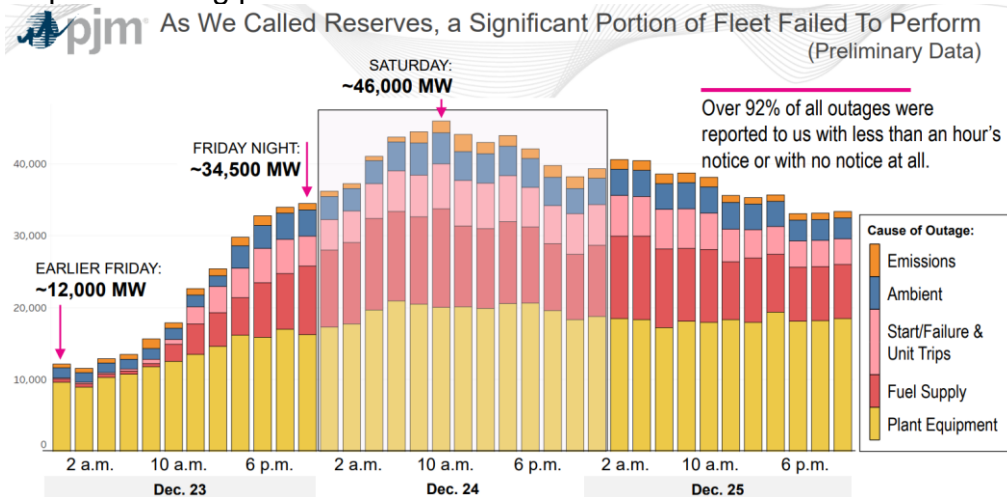
Electric use that day was about 10% higher than forecast and power plants failed to operate as expected, he said. Besides the 46 GW that failed to run on Christmas Eve, 6 GW of mainly gas-fired steam generation failed to come online when called on by PJM and the grid operator lacked electricity to refill pumped storage hydroelectric reservoirs overnight that would have normally provided power the following day, Bielak said. “Generation outages were unacceptably high and they occurred at the worst possible times for system operations,” Bielak said. “A large portion of our generation fleet failed to do what was required of them.”

More than 92% of the power plant outages were reported to PJM with less than an hour’s notice and in some cases no notice, according to Bielak. The grid operator avoided rolling power outages, partly by asking people to reduce their electricity use and through an

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emergency waiver from the Department of Energy that allowed some generating units to exceed their emissions limits, Bielak said. During the winter storm, PJM continued to import and export power. Exports peaked on Dec. 23 to support the Tennessee Valley Authority and other areas, but declined as PJM experienced power plant outages, Bielak said. PJM was a net importer during part of Christmas Eve.



PJM plans to release the results of its investigation into its operations during the winter storm in mid-April. Officials intend to meet with power plant operators to get more information about why there were so many plant outages. The power plant outage rate during the winter storm was higher than during the Polar Vortex in 2014, which led to the PJM's capacity performance framework, according to Mike Bryson, PJM senior vice president for system operations. PJM's capacity performance framework is designed to improve power plant performance by fining generators that fail to deliver electricity during emergencies and paying extra to those that exceed their power delivery requirements.

Power plant owners that fail to pay non-performance penalties will lose their PJM membership, officials said. PJM plans to release preliminary performance data in the first week of February. The penalties will be included in March bills. During the meeting, Bryson called for a tougher reliability standard for weatherizing power plants than the one pending at the Federal Energy Regulatory Commission. It should also be put in place sooner than planned, he said. The Natural Resources Defense Council called for market rule changes to improve power plant performance during extremely cold weather.

"History has proven again and again that gas is not as firm as it claims to be, and reliability will continue to suffer until that fact is accepted," Tom Rutigliano, NRDC senior advocate, said in a statement. PJM's year-round capacity market was designed to meet high demand during the hottest summer days, but is struggling to meet winter needs, according to Rutigliano. It should be split into seasonal markets that focus on each season's unique challenges, he said.

"FERC needs to take a serious look at how the industry is preparing for cold weather and find the political will to set binding winterization standards, including on natural gas supply," Rutigliano said. "PJM and FERC need to fix market structures that reward unreliable power plants." PJM Power Providers Group, a trade organization for generators, expects rule changes in response to Winter Storm Elliott, according to Glen Thomas, P3 president. "However, P3 fears events like this could become more frequent and severe if PJM and FERC do not support adjustments that ensure generators have pathways to be compensated for the costs and risks associated with providing the reliability that is envisioned by PJM's capacity design," Thomas said in an email.



**13 January 2023**

### **EU Approves €1.1 Billion Danish Scheme for Carbon Capture and Storage**

The European Commission has given its approval for a €1.1 billion scheme to support the roll-out of carbon capture and storage (CCS) technologies in Denmark. The aid will be awarded through a competitive tendering procedure open to companies active in any industrial sector, including the waste and energy sectors, with conclusion to take place this year. The maximum amount will be equal to €54.9 million per year, adjusted to inflation.

Under a 20-year contract, the beneficiary will capture and store an annual minimum of 0.4 million tonnes of CO<sub>2</sub> as from 2026. The aid will cover the difference between the estimated total costs of capturing and storing a tonne of CO<sub>2</sub> over the lifetime of the contract and the return expected by the beneficiary. According to the European Commission, Denmark committed to ensuring that the aid delivers overall CO<sub>2</sub> reductions and that it does not merely displace the emissions from one sector to another.

The measure is expected to increase investor confidence in CCS technology, reduce costs for future application of CCS technologies and facilitate the development of a commercial CCS market in Denmark. It is anticipated to enable the capture and storage of a minimum of 8 million tonnes of CO<sub>2</sub> over the total 20-year period, contributing to Denmark's efforts of reducing its greenhouse gas emissions by 70 per cent by 2030 compared to the 1990 level, as well as helping Denmark and the EU in meeting their objective of achieving climate neutrality by 2050.

"This €1.1 billion scheme will enable Denmark to capture and store a significant amount of CO<sub>2</sub>, preventing its release into the atmosphere," said Margrethe Vestager, Executive Vice-President in charge of competition policy. "It will help Denmark achieve its ambitious target of climate neutrality by 2050 at the latest, in line with the European Green Deal objectives, while ensuring that competition distortions are kept to the minimum."

The European Commission found that the scheme is necessary and appropriate to support the reduction of greenhouse gas emissions through the capture and storage of CO<sub>2</sub> in Denmark and that it has an "incentive effect" as potential beneficiaries would not carry out the investments and engage in a CCS project without the public support. The scheme will be subject to an ex-post evaluation, which will verify the effectiveness of the competitive bidding process, among other things. The Danish Energy Agency granted the first-ever permit for a CO<sub>2</sub> storage project in Denmark at the end of 2022, awarded to the Greensand Pilot Injection Project.

The permit allows up to 15,000 tonnes of CO<sub>2</sub> to be injected in the project's pilot phase, in the former Nini West oil field, and is valid for a period of four months, expiring on 1 April 2023.

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