

# **WORLD POWER SYSTEMS REVIEW**

**1 June 2024**

**15 May 2024**

## **China switches on first large-scale sodium-ion battery**

China Southern Power Grid Energy Storage, the energy storage division of China Southern Power Grid, has commissioned a 10 MWh sodium-ion battery storage station in Nanning, southwestern China. The company said the facility is the first large-scale project of its kind in China, and the first phase of a 100 MWh global project.

"China has put into operation the first large-scale storage station with sodium-ion batteries, marking a new era for low-cost batteries for large-scale use," said China Southern Power Grid in a statement. The 10 MWh sodium ion battery energy storage station features 210 Ah sodium ion battery cells that can be charged to 90% in 12 minutes, according to the company. The system consists of 22,000 cells.

"Compared with lithium-ion batteries, the raw material reserves of sodium-ion batteries are abundant, easy to extract, low cost and have better performance at low temperatures, so they have obvious advantages for large scale energy storage," the company stated. "With these batteries, storage cost can be reduced by 20% to 30%, and the cost per kilowatt-hour of electricity may be reduced to CNY 0.2 (\$0.0276)."

*Pv-magazine*

<http://www.pv-magazine.com/>

**15 May 2024**

## **AEP Ohio puts forth a data center power grid resource plan**

As data center providers look to build out new sites, unprecedented demands on the power grid are being created. A recent International Energy Agency (IEA) report forecast that data centers' total electricity consumption could reach more than 1,000 TWh in 2026.

However, AEP Ohio is not waiting for the problem to escalate. They are taking a proactive stance to address the issue. The electric utility filed a proposal with the Public Utilities Commission of Ohio in docket 24-508-EL-ATA that would create a new rate category for data center customers and cryptocurrency mining/mobile data center operations. Under the proposed rate structure, new data centers with loads greater than 25 megawatts (MW) and cryptocurrency mining operations/mobile data centers with loads greater than 1 MW would have to agree to meet specific requirements. This ensures that the right facilities are built at the right time, benefiting both AEP Ohio and the data center customers.

Marc Reitter, president and chief operating officer of AEP Ohio, said, "AEP Ohio is seeing unprecedented demand from data center customers, especially in the Central Ohio area." He emphasized that the structure will provide certainty to AEP Ohio and its customers, who need to develop long-term plans and offer data center and cryptocurrency mining customers a clear understanding of their obligations as customers. "While we see no concerns serving current or new residential and existing commercial or industrial customers, we need to ensure that the right long-term investments are made to the electric grid," Reitter said. "We need accurate plans and solid commitments from large data center customers so the right facilities are built at the right time."

*Light Wave*

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

**16 May 2024**

## **Biden-Harris Administration Announces \$71 Million Investment to Advance American Solar Manufacturing and Development**

As part of President Biden's Investing in America agenda, the U.S. Department of Energy (DOE) today announced a \$71 million investment, including \$16 million from the

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President's Bipartisan Infrastructure Law, in research, development, and demonstration projects to grow the network of domestic manufacturers across the U.S. solar energy supply chain. The selected projects will address gaps in the domestic solar manufacturing capacity for supply chain including equipment, silicon ingots and wafers, and both silicon and thin-film solar cell manufacturing. The projects will also open new markets for solar technologies such as dual-use photovoltaic (PV) applications, including building-integrated PV and agrivoltaics. These efforts complement and strengthen the Biden-Harris Administration's goal to rapidly deploy clean energy to help achieve net-zero emissions by 2050. These efforts advance the Biden-Harris Administration's Justice40 initiative, which set a goal that 40% of overall benefits from certain federal climate and clean energy investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution.

"The Biden-Harris Administration is committed to building an American-made solar supply chain that boosts innovation, drives down costs for families, and delivers jobs across the nation," said U.S. Secretary of Energy Jennifer M. Granholm. "Thanks to historic funding and actions from the President's clean energy agenda, we're able to deploy more solar power – the cheapest form of energy – to millions more Americans with panels stamped made in the U.S.A."

DOE selected three projects for the Silicon Solar Manufacturing and Dual-Use Photovoltaics Incubator funding program which will support the development of technologies to bring silicon wafer and cell manufacturing onshore. This investment will enable new solar companies to prove out their technologies with the goal of becoming eligible to apply for capital to scale-up manufacturing, accelerating their path to commercialization. Seven additional projects will advance dual-use PV technologies to harness their potential to electrify buildings, decarbonize the transportation sector, and reduce land-use conflicts.

Thin-film PV technologies, such as cadmium telluride (CdTe), and perovskites have potential advantages over the current dominant silicon technology, such as less energy-intensive manufacturing, lower manufacturing costs, simpler supply chains, and greater lifetime energy yield. Of the eight projects DOE selected for the Advancing U.S. Thin-Film Solar Photovoltaics funding program, four will address opportunities to improve efficiency, reduce costs, and bolster the supply chain for CdTe systems. DOE's Solar Photovoltaics Supply Chain Review identified CdTe as an opportunity to expand domestic production of solar panels. Improving the ability to use and recover materials efficiently when building and recycling panels is a promising approach to strengthen domestic CdTe PV competitiveness. Four other projects will prove out innovative tandem PV devices that pair established PV technologies like silicon and copper indium gallium diselenide (CIGS) with perovskites, an up-and-coming thin-film PV technology that is nearing market readiness and could be manufactured in the United States. One project leverages the United States' trade partnership with Canada to increase the supply of tellurium in the United States.

**DOE**

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

**17 May 2024**

## **Norsk Kjernekraft focuses on off-grid SMR projects**

The company noted that estimates of future energy demand in Norway vary from 50 TWh to 233 TWh. However, it says the introduction of artificial intelligence (AI) makes existing forecasts about power requirements invalid. "Basically, the need for data processing and data storage, unlike everything else, is unlimited. Artificial intelligence accelerates this need exponentially in reality, this means that there is no longer a limitation in power demand."

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Norsk Kjernekraft said that when hydropower was developed in Norway, industry was established where the hydropower plants were. However, with small modular reactors (SMRs), power production can now take place where the industry is located. "Because nuclear power, like hydropower, lasts for 100 years (with two upgrades after 60 and 80 years respectively), it gives the opportunity to recreate what hydropower has done for Norway. After the power plants have been paid off, they supply cheap electricity for a further 70-80 years - as hydropower has done."

In addition to generating electricity, nuclear power produces a lot of heat. High-temperature steam can be used for heat-intensive industries, such as for the production of steel and aluminium. It can also be used for carbon capture, as well as the production of hydrogen, ammonia and e-fuels. The residual heat can be used for district heating. According to Norsk Kjernekraft, all this reduces the need for electricity, and thereby also the need for grid development.

Building SMR power plants off-grid increases the value of the electricity because the rental of grid capacity is avoided, the company says. "In this way, the project economy for the nuclear power plants is improved, which is particularly important for the first power plants, which will be more expensive than the next ones. At the same time, the industry will receive guaranteed power supplies, which is of great value to a number of industry players."

By building the SMR power plant off-grid and in connection with heat-intensive industry, Norsk Kjernekraft says this ensures good project economics, while municipalities can build industry and jobs and ensure economic growth for future generations. Renewable power production can then be channeled towards other needs in Norway.

As an example, the company says Norway is attractive for data centers because it has a cool climate and is considered a 'safe' country. However, it says there will be no will to build many data centers if the power is to be supplied from land-intensive renewables. "With nuclear power, this problem is avoided. In addition, the nuclear power plant creates many jobs, both directly for the operation of the power plant, and indirectly for the industry that is being built."

Earlier this year, Google began construction of a data centre in the municipality of Skien - its first data centre in Norway - which is scheduled to begin operating in 2026. Google has said it wants 840 MW of electricity for the data centre over the next two decades. Norway's Energy Minister Terje Aasland has stated that Skien municipality must provide the power itself. The acting mayor has said the municipality will consider nuclear power.

Norsk Kjernekraft says it could build three or four SMRs of 300 MWe capacity each in connection with the data centre to deliver 900-1200 MWe of electricity (7.5-10 TWh annually). This, it says, is sufficient to meet the needs of the data centre as well as, for example, a green electrolysis factory for hydrogen as well as providing heat to industry in the area.

"Off-grid SMR will be used where it makes sense from a holistic point of view," the company said. "Regular connection to the network will still be considered where it makes sense, for example where extensive network infrastructure already exists or is planned. Hybrid solutions are also relevant."

Norsk Kjernekraft aims to build, own and operate SMR power plants in Norway in collaboration with power-intensive industry. It says it will prepare licence applications in accordance with national regulations and international standards. It will follow the International Atomic Energy Agency's approach for milestones, and focus on what creates value in the early phase. Financing will take place in collaboration with capital-strong industry and solid financial players.

The company entered into an agreement of intent last year on the investigation of nuclear power with several municipalities. In November, it submitted a proposal to the

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Ministry of Oil and Energy for an assessment into the construction of a power plant based on multiple SMRs in the municipalities of Aure and Heim. A corresponding report is in the process of being finalised for Vardø municipality. It is also investigating the construction of an SMR power plant at Halden. Last month, Norsk Kjernekraft said it had decided to initiate work on the impact assessment of a plot of land in Øygarden municipality, west of Bergen, to assess the possibility of establishing a nuclear power plant comprising up to five SMRs.

*World Nuclear News*

<http://www.world-nuclear-news.org/>

**20 May 2024**

## **Venezuela cracks down on bitcoin miners amid grid concerns**

The Venezuelan government will disconnect “all cryptocurrency miners” from the national electricity grid as part of a new control plan, the national Ministry of Electrical Energy (MPPE) announced on Friday. The MPPE shared in a statement on X that the crackdown is attributed to the government’s concerns regarding the stability of the grid. However, mining operations using off-grid power capacity do not appear to be targeted. This move follows the seizure of over 2,300 Antminer S19J Pro units last week in Maracay, located in north-central Venezuela. The bust, as reported by Últimas Noticias, is said to be linked to the Anti-Corruption Operation initiated by the government in March 2023.

The anti-graft campaign previously led to the arrest of Joselit Ramírez, the former president of state oil and gas company PDVSA and former national superintendent of crypto assets (Sunacrip). This operation led to the suspension of Sunacrip. It created additional regulatory uncertainty around cryptocurrencies in the country and prompted reports of large-scale bitcoin miners shutting down their operations.

Officials allege that PDVSA and Sunacrip were involved in embezzling between \$3 to \$20 billion from unregistered oil sales. The accusation comes amid PDVSA reportedly planning to increase the usage of USDT in its crude and fuel exports as the U.S. reimposed oil sanctions on the country. In September 2023, President Nicolás Maduro extended the reorganization of Sunacrip to March 15, 2024. However, that period has recently been extended for another six months. Venezuela has a history of electrical blackouts dating at least to 2010, with escalations in 2019.

*The Miner Mag*

<http://theminermag.com/>

**20 May 2024**

## **PJM Advances to Next Phase of New Interconnection Process**

PJM announced today the completion of Phase I System Impact Studies for 306 proposed generation projects as part of Transition Cycle #1 of PJM’s new interconnection process.

Project developers now have 30 days to decide whether to proceed with their new service requests into the next study phase of Transition Cycle #1, which will begin June 20. The projects that are part of this transition cycle are expected to clear PJM’s study process and be ready for construction by mid-2025. Separately, another 306 projects have previously qualified for an Expedited Process, or “fast lane,” with Final Agreements to be issued throughout 2024.

“This is another critical milestone for PJM’s widely supported interconnection process reform,” said Aftab Khan, Executive Vice President – Operations, Planning and Security. “New service requests for generation resources are moving through our process as designed and promised, with more than 200,000 MW of projects to be studied over the next two years to help states advance their energy policy goals.”

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The Phase 1 Study process will help developers evaluate whether their projects are economically viable. The Phase I Study results for the Transition Cycle #1 projects have been posted to a new webpage. The results posted include an overall report for this cluster of projects, as well as individual studies for each project. Similar to PJM's legacy Service Request Status page, projects can be filtered by fuel type and location, but now additional details about each project can be expanded into pop-up mini-dashboard windows. The new page also highlights PJM's move away from a queue-based study process to its current cycle-based process.

The legacy serial-study based page continues to provide information about projects that were part of PJM's legacy interconnection queue.

## **New Interconnection Process To Continue With Start of Cycle #2 in June**

The cutoff date for Transition Cycle #2 applications is also expected to be announced June 20, with an anticipated deadline of December 16. In total, PJM expects to process about 72,000 MW in projects by mid-2025 and 230,000 MW over the next three years; over 90% of those projects are renewable or storage. PJM's interconnection process reform, widely supported by stakeholders, was approved by the Federal Energy Regulatory Commission in November 2022 and went into effect in July 2023. The reforms, developed in collaboration with stakeholders, provide an efficient and timely process for handling New Service Requests by, among other changes, transitioning from a "first-come, first-served" queue approach to a "first-ready, first-served" cycle approach.

PJM continues to provide updates on study progress at the monthly public meetings of the Interconnection Process Subcommittee. Since the new interconnection process was implemented in July, 734 projects were eligible to be evaluated in the first step. Of those, 118 either dropped out of the process or did not post sufficient readiness requirements by the due date, clearing the queue of projects that were less certain to be developed but still requiring the same time and resources from PJM. The remaining projects fell into either the Expedited Process or Transition Cycle #1 as outlined above.

***Insidelines PJM***

***<http://insidelines.pjm.com/>***

**20 May 2024**

## **US Appeals Court Won't Pause EPA Power Plant Emissions Rule for Now**

A federal appeals court on Friday refused to temporarily pause a landmark rule issued by the U.S. Environmental Protection Agency requiring sweeping reductions in carbon emissions from existing coal-fired power plants and new natural gas plants. The U.S. Court of Appeals for the District of Columbia Circuit rejected a request filed by 25 Republican attorneys general for an administrative stay, which would have put the rule, which goes into effect in July, on hold while the court considers whether to impose a longer stay order.

The rule, a key part of Democratic President Joe Biden's broader climate agenda, mandates that many new gas and existing coal plants reduce their greenhouse gas emissions by 90% by 2032. It has been challenged in multiple lawsuits by 27 Republican attorneys general from states including West Virginia, Indiana, Ohio and Kansas, as well as electric utility, mining and coal industry trade groups. Only 25 of the attorneys general had asked for an administrative stay, although the lawsuits have all been consolidated.

The court didn't explain its Friday decision, but gave the EPA until mid-June to respond to the challengers' requests for a longer pause on the rule while the court considers the merits of the case. A spokesperson for the National Rural Electric Cooperative Association, a utility industry group that challenged the rule, said in a statement that the group looks forward to the court's decision on their request for a lengthier stay.

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Spokespeople for the other challengers and the EPA did not immediately respond to requests for comment.

The rule could force the U.S. power industry - a sector responsible for nearly a quarter of the country's greenhouse gas pollution - to install billions of dollars' worth of emissions control technologies or shut down the dirtiest facilities running on coal. The EPA said in the rule that the strict emissions reductions are feasible if power plants install carbon capture and sequestration (CCS) technologies, which capture emissions before they are released into the atmosphere. But the challengers have claimed that technology has not been meaningfully deployed in the real world, and would be too costly to install.

They have also claimed the rule exceeds the EPA's authority under the Clean Air Act, and would radically transform the nation's energy grid without explicit congressional permission to do so. The EPA, however, has said it believes CCS is viable and cost-effective, and is well within the agency's authority under the law. On Thursday, a group of 21 Democrat-led states including New York, California and Arizona, and five Democratic-led cities including Chicago and Denver, asked to defend the rule in court alongside the EPA. They said they have a significant interest in defending the rule since it will benefit them by helping to mitigate the costly and even deadly impacts of climate change.

They said that while their overall goals align with those of the EPA in the litigation, their specific interests in protecting their state lands and citizens are different from the EPA's interests as a pollution regulator. The lead case is *West Virginia et al. v. U.S. Environmental Protection Agency*, in the U.S. Circuit Court of Appeals for the District of Columbia Circuit, case No. 24-1120.

*Reuters*

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

**21 May 2024**

## **AEMO: Urgent investment needed for electricity reliability**

AEMO has today published an update to the 2023 Electricity Statement of Opportunities (ESOO) report, the 10-year reliability outlook for the National Electricity Market (NEM). The update was triggered due to material changes impacting reliability risks since the 2023 ESOO was published last August, including new commissioning dates for Project EnergyConnect, and mothballed gas and diesel generators in South Australia.

The addition of approximately 4.6 gigawatts (GW) of new generation and storage projects that have sufficiently advanced was also considered in this ESOO update. AEMO CEO Daniel Westerman said the report's findings again call for timely investment in projects to generate, store and share electricity to manage reliability risks driven by retiring coal plants. "Australia's energy transition is well underway," Mr Westerman said. "Industry and governments are responding to the reliability risks from retiring coal by investing in new infrastructure to ensure a reliable and secure electricity supply going forward. "The urgency for the timely delivery of transmission, generation and storage, and use of consumer electricity resources to support the grid, remains to meet consumers' energy needs," he said.

Today's report forecasts varying reliability gaps in all mainland regions of the NEM over the ESOO outlook period in the ESOO central scenario, which only considers existing, committed<sup>1</sup> and anticipated projects<sup>2</sup>. However, this assessment does not include federal or

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<sup>1</sup> Committed projects meet all five of AEMO's commitment criteria (land, contracts, planning, finance and construction) but have not yet met the requirements of their first commissioning hold point.

<sup>2</sup> Anticipated projects have made progress towards at least three of AEMO's commitment criteria and have provided AEMO confirmation or update of project status in the last six months.

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state government energy programs or approximately 280 GW of proposed generation and storage projects in the development pipeline, 4.5 times today's NEM capacity. Compared to the 2023 ESOO central scenario, reliability risks have increased in New South Wales and Victoria from 2024-25 to 2027-28 and increased in South Australia in 2026-27. Due to newly considered generation and storage developments, reliability risks are forecast lower than the 2023 ESOO central scenario towards the end of the horizon in all mainland regions.

"While new generation and storage capacity continues to increase, project development and commissioning delays are impacting reliability throughout the horizon," Mr Westerman said. "Reliability improves when considering actionable transmission projects<sup>3</sup> – those listed to proceed as soon as possible in the Draft 2024 Integrated System Plan – and when forecast grid support from consumer energy resources are applied. "Adding new generation and storage projects through federal and state government programs<sup>4</sup> then shows that reliability risks have the potential to be managed within relevant standards over most of the next 10-year horizon," he said.

As a result of the reliability gaps forecast, AEMO will tender for Interim Reliability Reserves in New South Wales and Victoria to minimise reliability risks should low reserve conditions emerge over summer 2024-25. For the first time, AEMO's reliability report includes new information on generation and storage locations which have the potential to improve regional reliability risks. With further transmission development, including VNI West and HumeLink, this analysis shows the locations in each mainland region that can provide the most reliability benefit through new generation and storage development.

The next ESOO will be published in August 2024 in accordance with the National Electricity Rules requirements, using further information from developers and market participant surveys, which feed into the Generation Information and Transmission Augmentation Information files.

**AEMO**

<http://www.aemo.com.au/>

**21 May 2024**

## **European consumers and industry to benefit from clean, secure and stable energy supplies with key market reforms now adopted**

The Commission welcomes today's adoption of important electricity and gas market reforms and the new regulatory framework to boost the development of hydrogen and other decarbonised gases. These reforms highlight Europe's determination to pursue the clean energy transition while enhancing security of supply and consumer protection and building on the lessons learnt from the energy crisis.

Future-proof energy markets will stimulate investments in clean energy and facilitate lower and more stable prices which are key to make European industry more competitive on the global stage. With the adoption of the revised electricity market design and the decarbonised gas and hydrogen package, the EU has further tools to reach its energy and climate targets under the European Green Deal. The updated gas market framework gives Member States the possibility to stop or limit imports of both piped gas and LNG from Russia and Belarus, in line with the REPowerEU objectives.

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<sup>3</sup> HumeLink, New England Renewable Energy Zone (REZ) Link Part 1, Hunter Transmission Project, Gladstone Grid Reinforcement, Victoria – New South Wales Interconnector West (VNI West), Marinus Link, and Queensland SuperGrid South.

<sup>4</sup> Including the first stage tender of the Capacity Investment Scheme in South Australia and Victoria, Queensland Energy and Jobs Plan, New South Wales Infrastructure Investment Objectives (IIO) Report and the Victorian Renewable Energy Target Auction 2 scheme.

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The electricity market reform gives consumers a wider choice of contracts and clearer information before signing contracts. They will have the option to lock in secure, long-term prices as well as to have dynamic pricing contracts to take advantage of price variability to use electricity when it is cheaper. Member States will have to establish suppliers of last resort so that no consumer ends up without electricity. Vulnerable consumers and the energy poor will be protected from disconnection and Member States will be able to extend regulated retail prices to households and SMEs in case of a crisis. On top of consumer protection, energy sharing is also strengthened. As an example, tenants will be able to share surplus rooftop solar power with a neighbour.

The reform will also help European businesses stay competitive by giving them access to more predictable energy costs. It creates the conditions for both suppliers and consumers to benefit from the expanded use of longer-term market instruments such as Power Purchase Agreements, two-way Contracts for Difference and forward contracts. This will provide investment certainty to both power producers and industrial consumers. Overall, both households and companies will be able to benefit from the lower costs of renewables, whose integration and availability will also be boosted by the new provisions on grid congestion, trading deadlines, demand response and storage, as well as EU-level auctions.

Finally, to ensure EU consumers will benefit from competitive markets with transparent price-setting, the Agency for the Cooperation of Energy Regulators (ACER) and national regulators will have enhanced ability to monitor energy market integrity and transparency. The new framework for the gas market will facilitate the uptake of renewable and low-carbon gases while ensuring security and affordability of energy for all European citizens. The reform of the gas market ensures that decarbonised gases and hydrogen can flow across Europe. In particular, the reforms will lead to the creation of a market for hydrogen, which will be key to curb emissions in hard-to-abate sectors such as heavy industries and transport. The Commission will also pilot a five-year project to bring together demand and supply of hydrogen to enhance market development and transparency under the European Hydrogen Bank.

Consumers will be better protected against supply and price risks. They will be empowered to take an active role in the market and to select cleaner supplies and contracts. Practically speaking, they will be able to switch suppliers more easily, use effective price comparison tools, get accurate, fair and transparent billing information, and have better access to data and new smart technologies. Following today's adoption, the revised legislation will now be published in the Official Journal of the Union and its provisions will enter into force according to specific timelines.

**EU**

<http://ec.europa.eu/>

**21 May 2024**

## **Is Vietnam trying to manage Foxconn's power demand?**

It seems Vietnam's success as a manufacturing base may be challenging its ability to power growth. Some reports are suggesting that Vietnamese officials have called on Apple supplier Foxconn to reduce power use by 30% at its assembly plants in the north of the country, an area that suffered power outages last year.

Foxconn is the world's largest contract electronics manufacturer; it is said to have half a dozen plants in northern Vietnam. While there does not appear to be a formal government acknowledgment of such a request, the Reuters news service cites sources saying that it went to multiple manufacturers. That said, this is not being presented as a requirement but as a precautionary measure. Last summer apparently saw a power shortage that led to US\$1.4 billion dollars in lost output. Indeed, the Reuters' source says that government has



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asked coal-fired power plants to delay maintenance to meet higher electricity demand in the hottest months.

Weather conditions are less challenging than in 2023 but authorities have boosted imports of coal and encouraged energy-saving to avoid shortages. Of course, Vietnam is heavily reliant on foreign investment – but the country is also seen as a useful alternative for overseas companies from industries such as semiconductor manufacturing given the perceived risk of investing in China at the moment. However, power could still be an issue. The prime minister has already promised nervous foreign investors that power shortages will not happen again.

*Developing Telecoms*  
<http://developingtelecoms.com/>

**24 May 2024**

## **First Network Code on Cybersecurity for the electricity sector published today**

Today, the European Union published the first-ever EU Network Code on Cybersecurity for the electricity sector. The publication is an important step to improve the cyber resilience of critical EU energy infrastructure and services. The new Network Code on Cybersecurity has been developed in response to the growing digitalisation and interconnection of national power systems. It provides a common standard to ensure the security and reliability of the interconnected system.

The Network Code will support a high, common-level of cybersecurity for cross-border electricity flows in Europe by setting common rules to perform cybersecurity risk assessments, report cyber-attacks, threats and vulnerabilities, and establishing cybersecurity risk management. It also includes recommendations for supply chain security. The publication of the network code on cybersecurity marks an important milestone for the completion of the internal energy market and the achievement of the European Union's energy objectives, both at the level of transmission and distribution electricity grids. The network code was indeed mandated by EU law under the Electricity Regulation (EU) 2019/943 and in the 2022 EU Action Plan to digitalise the energy system.

The drafting of the network code was achieved thanks to the excellent collaboration between the European Network of Transmission System Operators (ENTSO-E) and the European Distribution System Operators Entity (DSO Entity). ENTSO-E and DSO Entity also greatly value the close communication and open collaboration with the European Commission and ACER, who supported a consistent effort towards the delivery of the Network code. We also thank the European Union agency for Cybersecurity for the continuous and active support. In the coming months, ENTSO-E and DSO Entity will continue their collaboration and work on the different documents that will guide the implementation of the Network Code.

*ENTSO-E*  
<http://www.entsoe.eu/>

**24 May 2024**

## **Bladeless wind energy innovation aims to compete with rooftop solar**

A new bladeless wind energy unit, patented by Aeromine Technologies, has secured \$9 million in Series A funding to accelerate the roll-out of its innovative technology. The scalable, "motionless" wind energy unit can produce 50% more energy than rooftop solar at the same cost, said the company.

Aeromine's technology is primarily designed for installation on the edge of a large rooftop like an apartment building, a big box store, a factory or a warehouse, facing the predominant wind direction. The technology leverages aerodynamics like airfoils in a race

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car to capture and amplify each building's airflow. The unit requires about 10% of the space required by solar panels and generates round-the-clock energy, as long as the wind is blowing. Veriten, an energy research, investing, and strategy firm led the funding round, with participation from Thornton Tomasetti. The company said it has received nearly 11,000 inquiries from more than 6,500 companies and currently has a pipeline of 400 qualified projects. Its customers are primarily in industrial, logistics, automotive, commercial, and government sectors.

Aeromine said that, unlike conventional wind turbines that are noisy, visually intrusive and dangerous to migratory birds, the patented system is visually motionless and virtually silent. And unlike large centralized onshore and offshore wind farms, the space-efficient systems are mounted on roofs, bringing power closer to where it is needed, and lessening the need for expensive long-distance transmission infrastructure.

"Distributed power is a key and increasingly strategic element to an evolving 'all the above' energy mix," said Maynard Holt, founder & chief executive officer of Veriten. "We believe that distributed power innovation will play a vital role in helping companies fulfill their need for reliable, reasonably priced electricity and desire for low-impact power. Each unit weighs just over 1,000 lbs., can withstand winds of 120 mph, and can be upgraded to hurricane-resistant models that withstand winds up to 158 mph. The Aeromine generator system is a state-of-the-art rotor/stator system with a 5-kW permanent magnet generator.

A typical installation would connect 10 units or more, adding 50 kW of capacity to a roof. A ten-unit 50 kW system's electricity generation varies widely. Aeromine said a roof height of 16 feet and 4.5 meters per second average wind speed would produce about 20,000 kWh per year, while the same 10-unit system on a 50-foot-high roof with 8 meters per second average wind speed would produce over 150,000 kWh per year.

Aeromine told pv magazine USA that "pricing is in line with comparatively rated rooftop commercial solar power systems." The company expects to introduce a commercial solution into the European and North American markets in 2025. "Aeromine's proprietary technology brings the performance of wind energy to the onsite generation market, mitigating legacy constraints posed by spinning wind turbines," said Aeromine chief executive officer David Asarnow.

*Pv-magazine*

<http://www.pv-magazine.com/>

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ENTSO-E

<http://www.entsoe.eu/>

29 May 2024

## Over 713,000 customers without power in Texas, other states from storms

Over 713,000 homes and businesses in Texas, Kentucky and other states were without power on Tuesday as storms continued to batter the region since the long Memorial Day holiday weekend. That is down from more than 939,000 customer outages earlier on Tuesday. Tornado-spawning thunderstorms that swept the Southern Plains and the Ozark Mountains killed at least 21 people across four U.S. states over the long Memorial Day weekend.

Texas power company Oncor, a unit of California-based energy company Sempra Energy, opens new tab, has the most outages with over 397,000 customers without power in the Dallas-Fort Worth area. Oncor said it was assessing damages, making repairs and restoring outages caused by storms producing hail, rain and destructive winds, including wind gusts as high as 95 miles per hour (153 km per hour) in the Dallas-Fort Worth area and surrounding areas. "The damages caused to our facilities is extensive and restoration will likely take multiple days," Oncor added on its website. Major outages by state:

State	Outages
Texas	636,907
Kentucky	33,172
Arkansas	25,807
Missouri	9,106
California	8,514
Total Out	713,506

Reuters

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

30 May 2024

## EPRI: US data center electricity demand could double by 2030, driven by artificial intelligence

Internet queries utilizing artificial intelligence require about 10x the electricity of traditional internet searches, according to analysis by the Electric Power Research Institute.

# **WORLD POWER SYSTEMS REVIEW**

**1 June 2024**

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Data centers could consume 9% of the United States' electricity generation by 2030 — double the amount consumed today, according to a study released Wednesday by the Electric Power Research Institute.

The growth is being driven by increased computing power associated with artificial intelligence. AI queries “require approximately ten times the electricity of traditional internet searches and the generation of original music, photos, and videos requires much more,” EPRI said.

U.S. data center load is expected to grow to nearly 21 GW this year, up from 19 GW in 2023, according to a Federal Energy Regulatory Commission report this month. Data center electricity demand across the U.S. is expected to climb to 35 GW by the end of this decade, according to the FERC report.

A traditional Google search uses about 0.3 Wh while a query using ChatGPT — the chatbot developed by OpenAI — requires about 2.9 Wh, according to EPRI's “Powering Intelligence: Analyzing Artificial Intelligence and Data Center Energy Consumption” report.

EPRI's study examines four scenarios of potential data center electricity consumption growth, with varying estimates of public uptake of AI and data center energy efficiency gains. Under the scenarios, U.S. data center power consumption ranges from 4.6% to 9.1% of the country's generation by 2030.

“The data center boom requires closer collaboration between large data center owners and developers, utilities, government, and other stakeholders to ensure that we can power the needs of AI while maintaining reliable, affordable power to all customers,” EPRI Vice President of Electrification and Sustainable Energy Strategy David Porter said in a statement.

EPRI's analysis also looked at data center load impacts regionally. About 80% of U.S. data center load last year was concentrated in 15 states, led by Virginia and Texas.

The size of new data centers is growing, leading to challenges, EPRI noted.

“Connection lead times of one to two years, demands for highly reliable power, and requests for power from new, non-emitting generation sources can create local and regional electric supply challenges,” the report found.

However, those challenges can be mitigated through improved energy efficiency and flexibility, improvements to demand modeling tools and close coordination between utilities and data centers, EPRI said.

*Utility Dive*

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

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## **India's peak power demand hits a record 250 GW**

India's peak electricity demand set a new record as surging temperatures add to what's already the fastest growth in consumption in any major economy. The nation reported maximum demand of 246 gigawatts on May 29, according to data published Thursday by state-run Grid Controller of India Ltd. That tops a previous high of 243.3 gigawatts reached last September.

Some power shortfalls have been reported across the country during evening periods — when solar generation isn't available — though day-time demand has so far been met, according to the operator. The surging consumption has forced the government to revive output at gas-fired power stations, boosting demand for the fuel by as much as 12% from a year earlier, according to Kamal Kishore Chatiwal, managing director at Indraprastha Gas Ltd. “More and more gas-based generation capacities are coming on stream,” Chatiwal told Bloomberg Television in an interview on Thursday. Some plants, which were not competitive

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earlier, have started generating, said the executive, whose company is the sole distributor of gas for homes, industries and automobiles in Delhi.

Faced with accelerating electricity demand as the economy expands and adds more energy-hungry industries, India's government has ordered a fresh wave of coal-fired power plant capacity. That's a decision that could jeopardize Prime Minister Narendra Modi's targets to curb emissions in the world's third-largest polluter. Sales of power-intensive appliances like air conditioners during a scorching heat season have added to pressure on the energy system. Soaring temperatures in Delhi on Wednesday sent the capital's peak electricity demand to an all-time high. Abnormal heat is to expected continue in many regions in June, according to the India Meteorological Department.

*Bloomberg*

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

**30 May 2024**

## **Uzbekistan to Build Its First Big Battery**

Uzbekistan is in line for its first grid-scale battery energy storage project as it seeks to stabilize and strengthen its existing electricity grids and ramp up the uptake of renewable energy.

Nur Bukhara Solar PV LLC FE, a project company owned by Masdar, will deliver the 63 MW battery energy storage system alongside a 250 MW solar plant in the Alat district of the Bukhara region of south-central Uzbekistan. The project company has signed a 25-year power purchase agreement with the National Electric Grid of Uzbekistan and a 10-year operation term for the storage system.

The hybrid project has been billed as Central Asia's first renewable energy initiative with an integrated BESS component. Upon completion, the project is expected to generate more than 585 GWh of renewable energy per year, expanding reliable electricity access to approximately 75,000 households. The World Bank Group, the Government of Uzbekistan, and Masdar have signed a financial package for the construction and operation of the project. It includes a \$53 million loan from the International Finance Corporation (IFC) and loans for up to \$106 million from the Asian Development Bank (ADB), Dutch Entrepreneurial Development Bank, and Japan International Cooperation Agency.

The package also includes granted concessional senior loans of \$20 million each from the Canada-IFC Blended Climate Finance Program and ADB-managed Leading Asia's Private Sector Infrastructure Fund, while The World Bank is providing a guarantee of up to \$12 million to support the government's payment obligations under the project. IFC will also provide interest rate swaps for the entire debt amount, which it says will allow the project to effectively manage interest rate risks.

"Our growing partnership with Uzbekistan in renewables is bringing clean and sustainable energy to the population at competitive prices," said Wiebke Schloemer, IFC Director for Türkiye and Central Asia. "The new solar plant with a battery energy storage system will not just boost the uptake of renewable energy in the country, but also help stabilize and strengthen existing electricity grids and aid the global fight against climate change." Uzbekistan is at the forefront of promoting renewable energy in the region, aiming to generate a quarter of its power from clean energy sources by 2030.

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