

WORLD POWER SYSTEMS REVIEW

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DABS: Uzbekistan resumes electricity supply to Afghanistan

Afghanistan Breshna Shirkat (DABS) company announced on Sunday that technical issues preventing electricity imports from Uzbekistan and Turkmenistan have been resolved. This development has allowed the restoration of normal electricity supply to affected provinces, according to a statement made by the company on the X platform.

DABS reported that electricity is now being supplied as usual to the provinces of Balkh, Samangan, Parwan, Panjshir, Kapisa, Kabul, Nangarhar, Laghman, Paktia, Logar, Khost, Maidan Wardak, Ghazni, and Baghlan. It is worth noting that earlier today, electricity imports from Uzbekistan were interrupted due to technical problems, while supplies from Turkmenistan were halted because of storms. This caused a reduction in electricity imports to Balkh, Kabul, and nearby areas, DABS added.

UZ. DAILY

<http://www.uzdaily.uz/>

18 December 2024

Germany's 'Dunkelflaute' is causing an energy crisis in Europe

A new German compound noun is currently gaining traction in international news: Dunkelflaute. It describes weather that is cloudy and windless — in other words, the kind of conditions that highlight the vulnerabilities of renewable power production. Germany is currently experiencing a prolonged spell with stark consequences for itself and its European neighbours. The Dunkelflaute began to make headlines last week when the shortages in renewable electricity production caused a spike of wholesale prices. At times a megawatt hour cost up to €1000 — the highest level recorded in 18 years.

In theory, Germany's energy system is designed to be flexible since solar and wind energy fluctuate so much. Between May and August this year, Germany produced a quarter of its electricity through solar energy. But in November it was only 4.3%. In theory, increasing wind in the autumn and winter months is supposed to pick up the shortfall. But when the worst-case scenario happens and a Dunkelflaute hits in the winter months when energy consumption is at its highest, fossil fuels are supposed to step in.

Since the war in Ukraine has seen Germany's access to cheap gas from Russia cut, Europe's largest economy relies on the dirtiest fossil fuel of them all. In November over 30% of Germany's electricity was produced burning coal — a fuel Germany wants to phase out by 2038 at the latest. By contrast, Britain shut its last coal-fired power station this year. Falling back on gas is also tricky since Germany no longer gets it on tap from Russia and had to replace it with more expensive alternatives, mostly from Norway and the US. In early November, Germany's gas reserves were still 98% full. Within weeks, they have dropped to 85%. Now even oil had to be burnt at maximum capacity for electricity production.

Still, Germany's fossil fuel plants haven't delivered enough, and imports were ramped up from neighbouring countries like France and Poland. Data from November showed that nearly a fifth of imported electricity was made from fossil fuels and another 18% from nuclear energy. The latter seems particularly bizarre since Germany switched its last nuclear reactors off last year. For context: at their peak in the early 2000s, German nuclear plants produced a third of the electricity the country needed.

In order to facilitate its ideologically driven withdrawal from nuclear energy and meet domestic climate targets on paper, Germany has increasingly banked on importing energy from other countries even if its neighbours produce this in ways Berlin frowns upon. France produces 70% of its electricity from nuclear energy and Poland generates three quarters from fossil fuels, the vast majority from coal.

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Other countries are increasingly concerned about what it means if Europe's most populous country with its rapacious industry keeps importing more electricity than it exports. This is especially an issue during Dunkelflaute moments since Germany now proudly produces the majority of its electricity through wildly fluctuating renewables.

Norway is particularly affected. Last year, Germany received 43% of its gas from the Scandinavian country. It's also one of the biggest source countries for electricity imports to Germany. As a result of the spike in German demand, energy prices in Norway have shot up too. On Thursday, the Norwegian energy minister Terje Aasland didn't mince his words when he told the Financial Times that "it's an absolutely shit situation". Renegotiating energy relations with Europe is now set to become an election issue — "a crunch moment for EU-Norway relations," as one EU ambassador in Oslo put it. Sweden, which is also affected by the price hikes, was even more explicit about who and what is to blame. The Swedish energy minister Ebba Busch told the newspaper Aftonbladet that "Germany's energy system isn't right". On X she added: "it is a result of decommissioned nuclear power. When it's not windy, we get high electricity prices". If Germany was able to produce more electricity for the European network, she argued, prices would stay lower for all of us.

It's time for Germany to wake up to the reality that cheap, clean and reliable energy doesn't become a reality by occupying the moral high ground. With snap elections scheduled for February 2025, now is an ideal moment to rethink past mistakes on energy, particularly the nuclear exit. If the next government in Berlin carries on in the same vein as its predecessors, Germany risks not only the stability of its energy supply but also that of its relations with its European neighbours.

UnHerd

<http://unherd.com>

18 December 2024

UK's National Grid to invest up to \$44 bln in transmission business

Britain's National Grid, opens new tab said on Wednesday it would invest up to 35 billion pounds (\$44.45 billion) over the five years to March 2031 as per its business plan for its transmission business.

The company, which runs Britain's energy systems and operates electricity and gas businesses in New York and Massachusetts, said investments include more than 11 billion pounds towards maintaining and upgrading existing transmission networks, and construction works for three Accelerated Strategic Transmission Investment (ASTI) projects in the UK. The ASTI projects form a key part of National Grid's plan to build new electricity network infrastructure required to reduce the UK's reliance on fossil fuels by connecting 50 Gigawatt of offshore wind by 2030. Britain has a target to largely decarbonise its power sector by 2030, which will mean reducing its reliance on gas-fired power plants and rapidly increasing its renewable power capacity. National Grid said around 24 billion pounds would be allotted to pipeline investments.

Reuters

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

18 December 2024

'Explosive' demand growth puts more than half of North America at risk of blackouts: NERC

More than half of North America faces a risk of energy shortfalls in the next five to 10 years as data centers and electrification drive electricity demand higher and generator retirements threaten resource adequacy, the North American Electric Reliability Corp. said in a 10-year outlook published Tuesday.

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Summer demand is forecast to rise by more than 122 GW in the next decade, adding 15.7% to current system peaks, according to the reliability watchdog's 2024 Long-Term Reliability Assessment, or LTRA. NERC said its 10-year summer peak demand forecast has grown by more than 50% within the last year.

Federal policies are needed to support energy production, manufacturing and infrastructure, National Rural Electric Cooperative Association CEO Jim Matheson said in a statement. Grid officials have been sounding the alarm around system reliability for years and the most recent LTRA "continues painting a grim picture of our nation's energy future and growing threats to reliable electricity," he said.

NERC has previously warned about the pace of generator retirements and the changing resource mix, but now says the situation is becoming more urgent as demand forecasts surge and resource additions slow.

The LTRA recognizes confirmed generator retirements of 52 GW by 2029 and 78 GW over the 10-year assessment period. However, announced retirements by generators that have not begun the formal deactivation processes drive the total expected retirements to 115 GW by 2034. Those retirements are largely being replaced by variable generation, NERC said.

Peak reserve margins fall below the levels required by jurisdictional resource adequacy requirements in the next 10 years "in almost every assessment area, signaling an accelerating need for more resources," according to the report. However, "in the face of these pressures ... we've observed in this year's LTRA that the resource additions are slower than the industry projected," Mark Olson, NERC's manager of reliability assessments, said in a Tuesday call with reporters. "The overall resource capacity on the system has grown slightly since the last LTRA, but it is significantly less than what the LTRA had projected the system would be growing to, and that creates concerns."

The Midcontinent Independent System Operator faces a high risk beginning next year, with energy shortfalls in some areas possible during normal peak conditions. "Resource additions are not keeping up with generator retirements and demand growth," the LTRA noted.

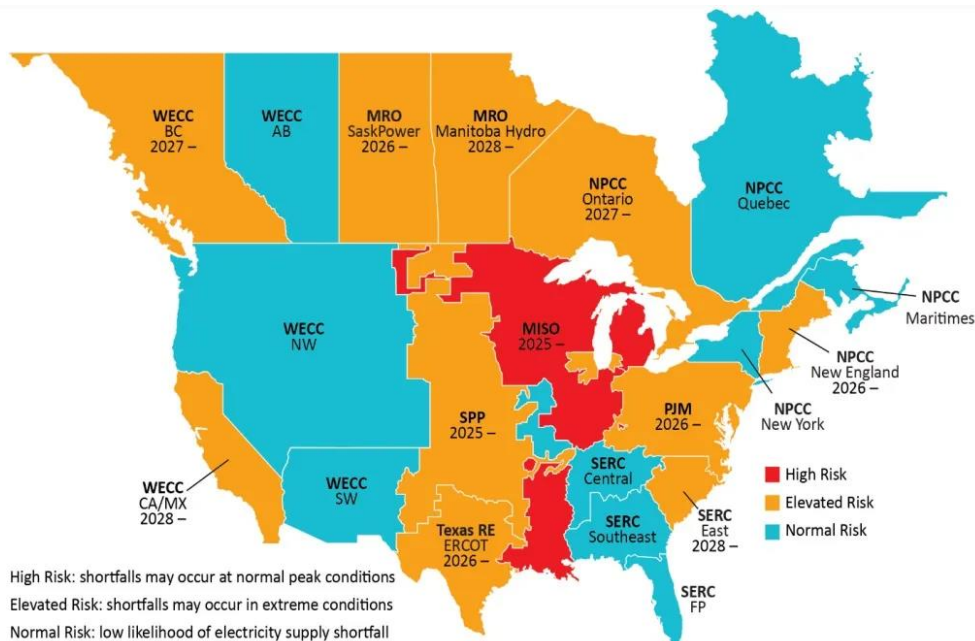


Figure 1: Risk Area Summary 2025–2029

The Southwest Power Pool and New England region face an elevated risk, with energy shortfalls possible under extreme conditions beginning in 2025 and 2026,

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respectively. There are natural gas supply risks in each area, and SPP also faces potential shortfalls if wind generation falls below expectations. In November, NERC warned that it is concerned about the potential for freezing temperatures to impact delivery of natural gas to power plants this winter.

PJM Interconnection faces elevated risks beginning in 2026. “Resource additions are not keeping up with generator retirements and demand growth,” the LTRA said. “Winter seasons replace summer as the higher-risk periods due to generator performance and fuel supply issues.” In the Electric Reliability Council of Texas footprint, “surging load growth is driving resource adequacy concerns as the share of dispatchable resources in the mix struggles to keep pace,” NERC said. “Extreme winter weather has the potential to cause the most severe load-loss events.”

“We’re seeing demand growth like we haven’t seen in decades,” said John Moura, NERC’s director of reliability assessment and planning analysis. “Simply put, our infrastructure is not being built fast enough to keep up with the rising demand. So we’re here at a moment where collaboration, urgency and foresight are really non-negotiable.”

The “explosive” demand growth is being driven by new data centers, building and transportation electrification and other large commercial and industrial loads, such as new manufacturing facilities and hydrogen fuel plants, NERC said. The Electric Power Supply Association, which represents merchant generators, called for policies that support competitive markets in order to meet the rising demand.

“Relying on the integrated resource planning used by utilities and the business model of the last century is no way to meet the moment,” EPSCA President and CEO Todd Snitchler said in a statement. “Competitive markets remain the best vehicle to ensure reliability during this transformational period.” America’s Power, which represents various industries involved in coal-fired power generation, said its analysis indicates utilities plan to retire almost 60,000 MW of coal capacity by the end of 2029 — and the retirements will happen alongside a 128,000 MW rise in demand.

“Fortunately, utilities are already postponing the retirement of power plants in some regions of the country, but utilities in other regions need to follow this trend,” America’s Power President and CEO Michelle Bloodworth said. “With electricity demand exploding due to electrification, data centers, and industrial growth, something has to give, or we will damage our economy and leave Americans without electricity.” The National Mining Association, which represents coal producers, said “the grid reliability math isn’t adding up.”

“An increasingly dangerous situation will be untenable without a sharp change in policy,” NMA President and CEO Rich Nolan said in a statement. “Surging electricity demand is colliding with an unworkable regulatory agenda that is producing self-imposed scarcity, undermining affordability and reliability.” NMA called on the incoming Trump administration to pursue a regulatory agenda that “addresses this unfolding electricity supply crisis.” NRECA’s Matheson sent a letter to Trump on Dec. 4 supporting policies that “prioritize investment in American energy production, manufacturing and infrastructure ... We urge you to take a coordinated approach which ensures that energy projects can be built efficiently, effectively, and at reasonable cost.” Trump said he wants to expedite federal permits and environmental reviews for construction projects worth more than \$1 billion. Many infrastructure megaprojects — in particular energy projects — fall in that price range.

NERC’s long-term assessment “points directly to the need for a pro-energy policy agenda that prioritizes reliability and affordability,” Matheson said in a statement. “We urge President Trump and congressional leaders to prioritize reliability right out of the gate next year before it’s too late.”

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

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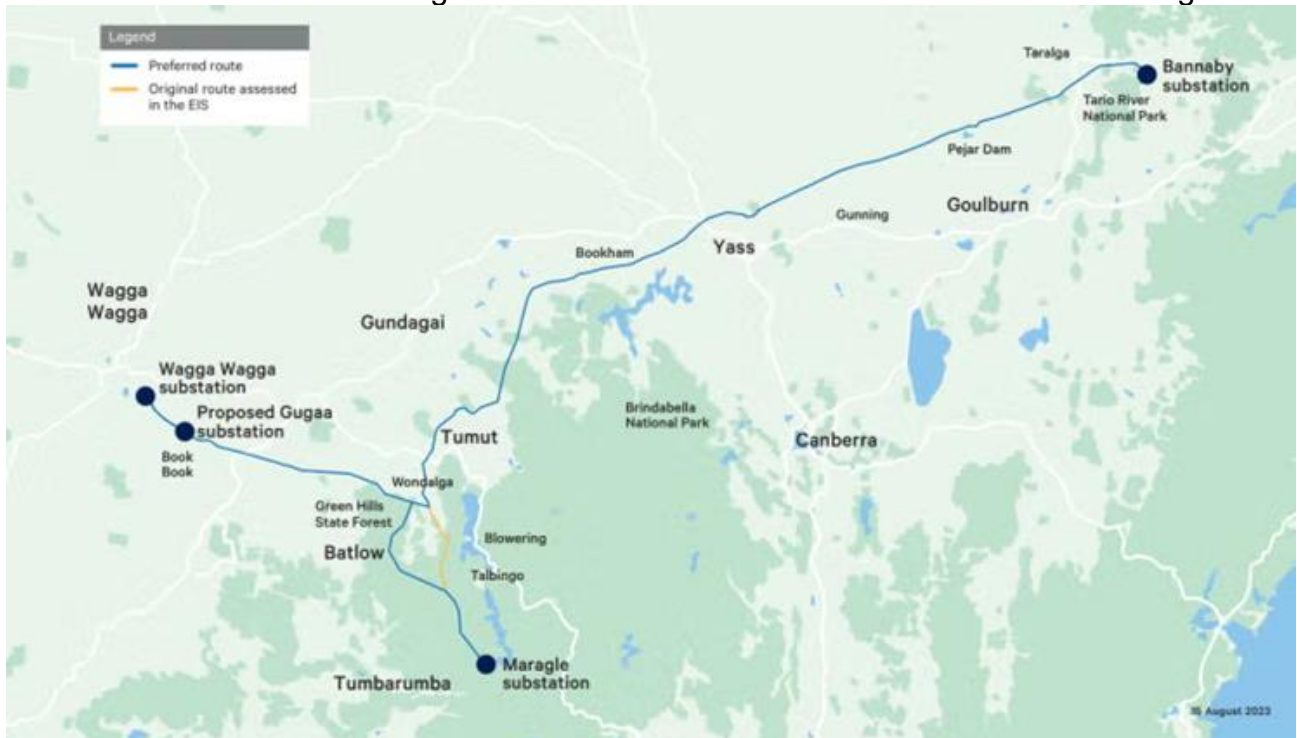
New transmission project approved in NSW to connect Snowy 2.0 to the grid

The \$4.89 billion HumeLink transmission project, a critical component in connecting the Snowy 2.0 expansion to Australia's electricity grid, has received final approvals. Construction is set to begin early next year, following the Final Investment Decision (FID) by Transgrid's Board.

HumeLink will deliver 365km of 500-kilovolt high-voltage transmission lines across New South Wales, linking Wagga Wagga, Bannaby, and Maragle. Once operational, it will unlock 3GW of renewable energy, including 2200MW of on-demand power from Snowy 2.0 – enough energy storage to power three million homes for a week. The project is expected to provide more than \$1 billion in net benefits to Australian consumers while playing a pivotal role in enabling the Snowy Hydro Scheme to integrate more renewable energy into the grid.

The Clean Energy Finance Corporation (CEFC) is backing the project with approximately \$450 million in concessional-loan financing and \$1 billion in subordinated notes. Transgrid security holders are contributing \$1.5 billion, following their earlier \$690 million investment in the VNI West project. Transgrid Group CEO Brett Redman emphasized the importance of Snowy 2.0 to the project's success. "HumeLink will reinforce the southern NSW electricity grid and enable the integration of new renewable generation, particularly from Snowy 2.0, which is a cornerstone of Australia's renewable energy transition," he said.

Redman added: "Bringing this energy online will benefit millions of Australians on the eastern seaboard by providing access to cheaper renewable energy. HumeLink and VNI West are essential to achieving the Australian and NSW Governments' net zero targets."



Following detailed design and preparatory work, major construction is expected to commence in early 2025, with completion slated for late 2027. HumeLink will generate 1,600 construction jobs and more than 60 ongoing roles, while creating significant opportunities for regional and national suppliers. The project includes over \$11 million in community investments to deliver lasting benefits, including local employment, training, and skills development. Most of the new transmission lines will be built within existing corridors to reduce environmental impacts, and strict conditions are in place to protect ecosystems.

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Minister for the Environment and Water Tanya Plibersek reinforced the government's commitment to renewable energy. "Labor is getting on with the job of transforming Australia into a renewable energy superpower. I've approved almost 70 renewable energy projects – enough to power more than seven million Australian homes," she said. "HumeLink is vital to unlocking Snowy 2.0 and boosting renewables in the grid. Australians have a choice between an energy transition that's already driving down prices or Peter Dutton's risky and expensive nuclear plan," Plibersek added.

Water Power Magazine

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

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Five new pan-European energy projects

Since its origin in 1984 the EU's framework programmes have funnelled close to €200 billion (US\$210 billion) into thousands of research and development projects across multiple fields. In its current guise Horizon Europe (FP9), which started in 2021, is set to deliver half as much again – €95.5 billion (\$104.5 billion) – by 2027, with new projects continuing to launch.

Here are five new energy sector projects that were initiated during 2024.

- ECLIPSE project to develop a reference framework for energy applications

The project ECLIPSE is proposed to implement and demonstrate an open source European reference framework for energy consumer applications across the EU. With this, consumers should be provided with simple, useful and easy-to-use information on energy savings and other benefits, such as CO2 reduction and other economic and social incentives.

- Project AI-EFFECT to establish energy sector AI use cases

The AI-EFFECT project is proposed to develop and validate multiple use cases of AI in the energy sector, including multi-energy systems, congestion management, energy efficiency and DER integration. A key aim also is to establish a European AI test and experimentation facility, virtually connecting existing European computer and lab facilities through a digital platform.

- ECS4DRES project to advance monitoring and control of DERs in Europe

The ECS4DRES project is aimed to strengthen the reliability, safety and resilience of distributed renewable energy systems with the development of advanced monitoring and control technologies. The project is also planned to deliver the underlying interoperable and low latency communication systems along with algorithms, AI tools and methods.

- EasyDC-FOS project to develop next gen HVDC cables

The EasyDC-FOS project is focused on the development of a new generation of high voltage direct current (HVDC) cables. The new cables are planned to operate at voltages above 525kV and be paired with an intelligent monitoring system based on fibre optics with integration in a cyber-secure digital environment.

Smart Energy

<http://www.smart-energy.com/>

20 December 2024

Robots Deployed for Ice Removal on Sichuan Power Grid for the First Time at Heights of Over 100 Meters

Recently, in Daqing Township, Xichang City, Liangshan Yi Autonomous Prefecture, the State Grid Sichuan Ultra-High Voltage Company innovatively used an ice-removal robot to successfully clear ice from the overhead ground wires of the Jinping-Sunan ±800 kV

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UHVDC transmission project. This marks the first time that Sichuan's power grid has employed a combination of "drones and ice-removal robots" to complete de-icing operations on UHV projects.

The ice-removal robot is a multi-functional de-icing device specifically developed for transmission lines. It operates by being suspended above the power lines via a heavy-lift drone, and it clears ice from conductors ranging in diameter from 50 to 300 square millimeters using methods such as cutting, impact, and rolling. This advanced robot features remote control capabilities, can perform de-icing on both conductors and ground wires, and transmits images in real-time. It efficiently navigates icy conductors, maintaining stability while de-icing, traversing slopes, overcoming obstacles, and applying brakes when necessary. The ice-removal robot effectively addresses the challenge of clearing ice from overhead ground wires, which has traditionally been difficult to manage.

China News
<http://sc.cri.cn/>

20 December 2024

World's highest-altitude solar power plant goes into operation

The state-owned Chinese company China Huadian Corp. has fully launched the second stage of the Caipeng solar power plant (SPP) in the Tibet Autonomous Region in northwestern China. The second stage includes 170,000 photovoltaic panels with a total capacity of 100 MW located at an altitude of 5,228 meters. The first stage of this project, which totaled 50 MW, was completed in December 2023. The new SPP has become the highest-altitude SPP in the world, taking the mantle from the power plant located at an altitude of 4,700 m, built in Tibet by Jietion Solar in 2020.

A distinguishing feature of the project is the use of bifacial solar panels with tunnel oxide passivated contact (TOPCon), which use the reflectivity of snow to increase the efficiency of power generation. The temperature coefficient of these panels is a mere 0.3%: with an increase in temperature by 1 degree Celsius, the power of TOPCon PV modules drops by just 0.3%, while for most solar panels this coefficient exceeds 0.4%. The new power plant is equipped with 20 MW accumulators capable of storing 80 MWh at the same time, which is equivalent to the daily consumption of 200 households. In many ways, the project represents the convenience of using solar panels to supply energy to remote areas. In Russia, combined solar-diesel generators are used for this purpose: diesel generators supply power in the morning and evening hours, while solar panels generate electricity during the day, sending the excess to accumulators, from which remote villages are supplied at night. In recent years, Rosseti has launched a number of these generators in the Tomsk Region and the Trans-Baikal Territory.

Global Energy
<http://globalenergyprize.org/>

20 December 2024

Abydos solar plant opens in Egypt

AMEA Power, a renewable energy company, has announced the commissioning of the 500MW Abydos Solar PV Plant in Egypt. The plant is the country's largest solar project yet. The project was inaugurated at a ceremony attended by the Minister of Electricity and Renewable Energy, His Excellency Mahmoud Esmat and chairman of AMEA Power, Hussain Al Nowais.

Financed by the International Finance Corporation (IFC), Dutch Entrepreneurial Development Bank (FMO), and Japan International Cooperation Agency (JICA), the Abydos Solar PV Plant will generate around 1,500GWh of clean energy annually which is enough to

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power approximately 300,000 households. According to AMEA Power, the plant has been completed within just 18 months, with more than 3,000 personnel contributing to its construction.

“I am proud to announce that the 500MW Abydos Solar PV Plant is now fully operational – a landmark achievement that highlights the dedication of our team, the strength of collaboration, and the importance of empowering local communities,” remarked Al Nowais. “This milestone demonstrates AMEA Power’s technical excellence and sets a new standard for renewable energy projects. The solar power plant is a significant step in Egypt’s renewable energy strategy, supporting the goal of achieving 42% of energy generation from renewables by 2030. Together, we are driving progress toward a sustainable future.”

Technical Review

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

21 December 2024

France adds first nuclear reactor in 25 years to grid

France connected the Flamanville 3 nuclear reactor to its grid on Saturday morning, state-run operator EDF said, in the first addition to the country's nuclear power network in 25 years. The reactor, which began operating in September ahead of the grid connection, is going online 12 years later than originally planned and at a cost of around 13 billion euros - four times the original budget.

"EDF teams have achieved the first connection of the Flamanville EPR to the national grid at 11:48am (1048 GMT). The reactor is now generating electricity," EDF said in a statement. The Flamanville 3 European Pressurised Reactor is France's largest at 1.6 gigawatts (GW) and one of the world's biggest, along with China's 1.75 GW Taishan reactor, which is based on a similar design, and Finland's Olkiluoto.

It is the first to be connected to the grid since Civaux 2 in 1999 but is being brought into service at a time of sluggish consumption, with France exporting a record amount of electricity this year.

EDF is planning to build another six new reactors to fulfil a 2022 pledge made by President Emmanuel Macron as part of the country's energy transition plans, although questions remain around the funding and timeline of the new projects.

Reuters

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

23 December 2024

Commonwealth Fusion Systems to site first fusion plant in Virginia

Commonwealth Fusion Systems has selected the James River Industrial Park in Chesterfield County, Virginia to site its planned world first grid-scale fusion power plant. The proposed site near to Virginia’s capital Richmond was selected after a search globally and is currently owned by Dominion Energy Virginia.

As part of the effort, CFS has reached an agreement with Dominion Energy Virginia to provide non-financial collaboration, including development and technical expertise as well as leasing rights for the proposed site. “This is a historic moment. In the early 2030s, all eyes will be on the Richmond region and more specifically Chesterfield County, Virginia, as the birthplace of commercial fusion energy,” promises Bob Mumgaard, CEO and co-founder of Commonwealth Fusion Systems.

“Virginia emerged as a strong partner as they look to implement innovative solutions for both reliable electricity and clean forms of power. We are pleased to collaborate with Dominion Energy.” CFS intends to independently finance, build, own and operate the grid-

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scale fusion plant, known as ARC, with a generation capacity of around 400MW. Currently CFS is completing development of its demonstration fusion machine, SPARC, at its headquarters in Devens, Massachusetts.

SPARC, a tokamak with high temperature superconducting magnets, is expected to produce its first plasma in 2026 and net fusion energy shortly after to demonstrate a commercially relevant design that will produce more power than consumed. With the core technology refined in SPARC, the way should be paved for ARC, which is expected to deliver power to the grid in the early 2030s. Edward H. Baine, President of Dominion Energy Virginia, describes CFS as the clear industry leader in advancing the energy potential of fusion. "Our customers' growing needs for reliable, carbon-free power benefits from as diverse a menu of power generation options as possible, and in that spirit, we are delighted to assist CFS in their efforts."

Part of SPARC's 'secret sauce' is the in-house developed high temperature superconducting magnets, which enable stronger magnetic fields and a more compact and thus lower cost design. In November CFS announced successful testing of its central solenoid model coil, which paired with similar tests with the toroidal model field coil in 2021, validates the two types of magnets needed for SPARC.

CFS also has validated its high temperature superconducting cable technology, named PIT VIPER, with internal electrical insulation to minimise heating when rapidly ramping current in an magnet. In the tests, the electrical current was ramped up to 50,000A, the maximum planned for SPARC, which was used to create a 5.7T magnetic field, about 100,000 times the strength of the Earth's magnetic field. Following the first ARC, CFS anticipates building potentially thousands more, with each about the size of a big-box store with about the same site needs.

Power Engineering Int
<http://www.powerengineeringint.com/>