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Unlocking the potential of battery storage

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Danish multinational energy company Ørsted has recorded "solid" first quarter operational earnings, despite challenges in the offshore wind sector. *Page 9*

Technology Focus: Re-imagining nuclear

Cartridge-based molten salt reactors can help decarbonise industry and unlock clean, reliable power across Europe. *Page 15*

"One big beautiful" tax bill puts brakes on US clean energy

Abigail Ross Hopper says the bill will kill jobs and increase electricity costs

Clean energy groups voice dismay and clean energy stocks tumble, as the US government makes major revisions to the Biden-era US Inflation Reduction Act. **Junior Isles**

A bill passed in the US House of Representatives looks set to put the brakes on a clean energy boom in the United States that has been driven by subsidies provided in 2022 under the Inflation Reduction Act (IRA).

Last month Republican lawmakers narrowly passed what President Donald Trump has called "one big beautiful bill" to carry out his administration's plan to cut taxes and boost spending on the military and border enforcement. The bill would effectively end Biden-era tax credits for clean energy projects years sooner than planned, making them unusable for most companies.

Clean project developers and manufacturers that benefit from the subsidies said the rollback would shutter factories, kill jobs and increase electricity costs for US households. Energy analysts at the Rhodium Group said their preliminary review of the bill found the changes could raise household energy costs by as much as 7 per cent.

"If Congress does not change course, this legislation will upend an economic boom in this country that has delivered an historic American manufacturing renaissance, lower electric bills, hundreds of thousands of good-paying jobs, and tens of billions of dollars of investments primarily to states that voted for President Trump," Abigail Ross Hopper, President of the Solar Energy Industries Association, said in a statement.

Climate advocacy group Climate Power said cuts to the clean energy industry have led to 20 000 job losses in the US and threatened almost $70 billion in project investments. It said almost 100 projects had been cancelled, delayed or threatened since the November presidential election.

It warned that a further 40 000 clean energy jobs are now under threat, as they are attached to paused projects or linked to companies that were previously awarded federal grants or loans that the Trump administration now plans to cut.

While the industry was already anticipating the gradual phase-out of wind and solar tax credits, the new version of the bill accelerates this timeline, Raymond James analyst Pavel Molchanov told *Reuters*.

Under the new proposed timeline, solar or wind projects must begin construction within 60 days of the bill's

Continued on Page 2

US and Europe drive global power emissions higher in 2025, as China records biggest cuts

Global emissions from the power sector have remained largely flat due to higher fossil fuel power generation, despite China achieving its biggest cut to power emissions since 2020 so far this year. The disappointing news has been attributed to higher fossil fuel power generation in the United States and Europe.

The US and Europe emitted a combined 801 million tonnes of carbon dioxide (CO_2) from fossil fuel fuel-based power production during January to March, data from Ember shows.

The higher emissions from the US and Europe largely offset a 60 million t drop in fossil power emissions in China and means that global power sector pollution levels remain elevated despite reductions by the world's top polluter.

Power producers in both the US and Europe boosted generation from fossil fuels such as coal and natural gas during the opening months of 2025 compared to a year earlier.

In Europe, sustained low wind speeds reduced supplies of clean power has forced utilities to compensate, with 8 per cent more fossil fuel-fired output than during January to March of 2024.

Gas fired generation climbed by 8 per cent while coal fired output rose by 6 per cent during the first quarter of 2025 compared to the same months in 2024, according to Ember.

In the US, steadily rising power demand coupled with strong support for fossil fuels from the new administration of President Donald Trump spurred utilities to increase fossil fuel power output by 4 per cent during January to March from the year before.

However, sharply rising gas prices drove utilities to prioritise generation from cheaper-to-run coal plants, with coal fired output jumping by 23 per cent during January to March 2025 from the same months in 2024. Gas fired power output shrank 4 per cent. This will further drive overall power emissions, as US power firms produce far more CO_2 from coal fired power generation than from gas fired generation.

US generators are also set to increase fossil fuel fired power production to meet the summer peak power demand.

Meanwhile, emissions from China's power sector were at their lowest as overall power demand during the opening months of 2025 was impacted by a sluggish economy, which has been hampered by an ongoing construction sector credit crisis and more recently by the trade war with the US.

Lower output by industrial plants and factories in turn reduced demand for power by the commercial sector, and allowed utilities to reduce output from fossil fuels by 4 per cent during January to March from the same period in 2024.

Going forward, however, Ember believes China's manufacturers are likely to boost production following the 90-day trade truce with the US.

Higher factory activity will directly trigger more power demand, and will likely force Chinese power firms to lift output from fossil fuels to ensure adequate power supplies over the coming months the energy research group added.

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enactment and finish construction by year-end 2028. Otherwise, they will no longer be eligible for tax credits.

Diego Espinosa, Senior Research Analyst at Wood Mackenzie, said the bill introduces "additional stress" to its wind outlook. "While it encourages a focus on operational readiness and project completion, it also poses challenges for investments and complicates financing."

The bill rolls back a number of the IRA's programmes and provisions, such as the Greenhouse Gas Reduction Fund and funding to reduce air pollution. It would also remove the 30 per cent federal tax credit for taxpayers who install solar rooftop systems, posing a significant challenge to the industry.

Investors were surprised by the scale of changes to IRA-era clean energy incentives since the initial draft of the bill was released on May 12. Analysts at Jefferies equity research said that while the Senate would tinker with the House's proposals, the cuts that Republicans included in the updated text of their budget were "sledgehammer strikes" and the outcome was "worse than feared".

Clean energy stakeholders now turn their attention to the Senate, where the bill is headed before it is sent to the President, hoping it will reverse many of the proposed revisions to the IRA.

Share prices in US renewable companies plummeted following the vote. Sunrun led the slide, with shares falling nearly 41 per cent, SolarEdge Technologies (SEDG.O), fell nearly 26 per cent. JinkoSolar, dipped 4.7 per cent, while First Solar and Canadian Solar dropped 5.4 per cent and 6.4 per cent, respectively. Shares in NextEra Energy, the biggest US power group by market capitalisation and the country's largest developer of renewable energy, closed 6.4 per cent lower.

The fossil fuels lobby lauded the bill, with the American Petroleum Institute saying it would help "restore American energy dominance".

Wood Mackenzie noted that the biggest winner in the proposed House bill is carbon capture, utilisation and storage (CCUS), as the 45Q tax credit remains largely unchanged. Rohan Dighe, Research Analyst at Wood Mackenzie, said: "While the Ways and Means Committee's proposal does include two modifications to the 45Q carbon sequestration tax credit, its value and duration – attributes that make it one of the most attractive CCUS incentives in the world – remain intact."

Another small positive for the climate change lobby is that tax credits affecting the nuclear sector were exempted from the cuts.

Wood Mackenzie's Rohan Dighe says CCUS is the biggest winner

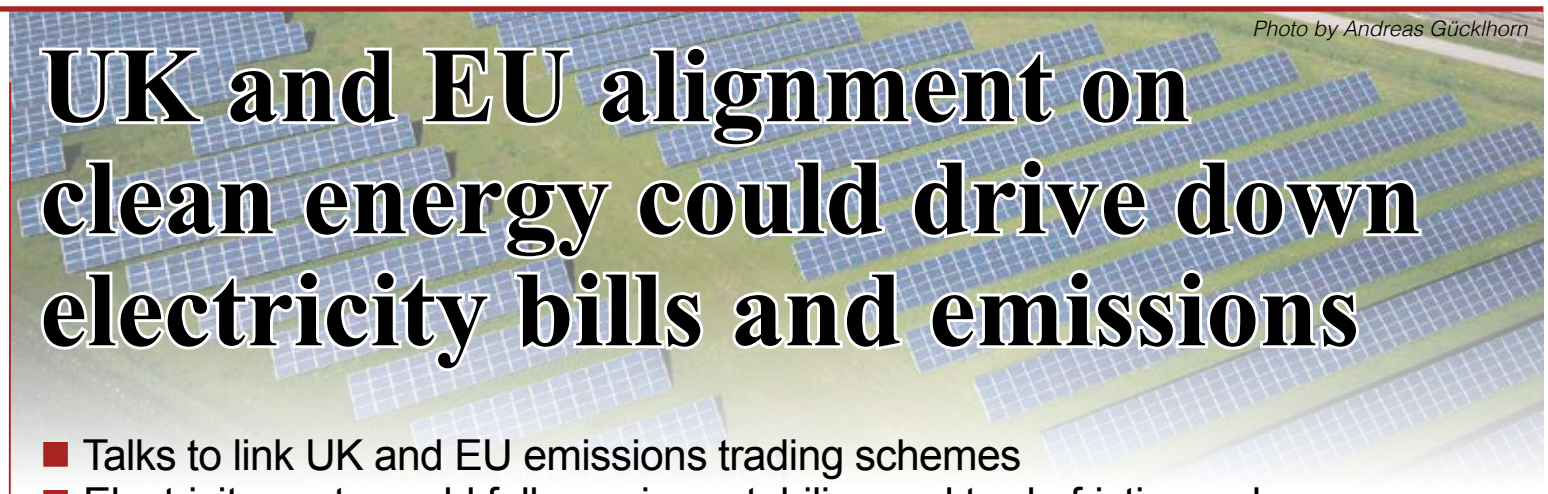

Photo by Andreas Gücklhorn

UK and EU alignment on clean energy could drive down electricity bills and emissions

- Talks to link UK and EU emissions trading schemes
- Electricity costs could fall as prices stabilise and trade friction reduces

Junior Isles

A UK–EU Agreement that includes a commitment to linking their respective Emissions Trading Schemes (ETS) could lower bills and support both the UK and EU in meeting their decarbonisation goals.

The agreement marks the start of negotiations to not only align their ETS' but also their commitment to work together to create more jobs in the clean energy sector.

The UK government said the agreement aims to maximise cooperation on renewable technologies, while supporting thousands of jobs and boosting growth in technologies including hydrogen and carbon capture use and storage.

Commenting on the announcement, RenewableUK's Executive Director of Policy, Ana Musat, said: "This is potentially great news for billpayers in the UK and across the rest of Europe, as it could drive down the cost of electricity in the years ahead by stabilising prices and reducing trade friction – including trading in clean electricity generated in the North Sea via interconnectors between countries.

"Crucially, it could remove the need for the EU's Carbon Border Adjustment Mechanism (CBAM) which is a tax on exports of electricity and goods from the UK and other countries into the EU.

The UK organisation representing the renewable energy sector said the UK and the EU share the same ambitions on decarbonisation to tackle climate change while reducing energy bills for consumers, "so aligning the Emissions Trading Schemes would be a natural next step" towards doing business more efficiently with each other.

Enhanced cooperation on carbon pricing would deliver clear benefits for businesses, reducing administrative burdens, lowering costs, easing trade friction, and supporting both the UK and EU in meeting their decarbonisation goals, say industry experts.

Rachel Solomon Williams, Executive Director at the Aldersgate Group, said: "The explicit recognition that [ETS] linkage should enable UK and EU goods to benefit from mutual exemptions from respective CBAMs, was heartening.

"This Agreement signals the beginning of formal negotiations on ETS linkage, and it is essential that the UK government maintains momentum. Timely progress is vital to provide the policy certainty that businesses and investors need. In particular, we call for urgent clarity on how these negotiations will intersect with compliance requirements under the EU CBAM. With the EU CBAM entering full implementation in 2026 and the UK's expected in 2027, businesses on both sides of the Channel need a stable policy framework to inform strategic investment decisions."

Aldersgate also welcomed broader commitments to deepen cooperation on electricity markets and expand regulatory dialogue on emerging low-carbon technologies.

"This government made a commitment to deliver growth underpinned by a modern industrial strategy and the decarbonisation of our energy systems, today's agreement marks a significant step forward," said Williams.

The UK and the EU also agreed to put the Trade and Co-operation Agreement's Energy chapter on a permanent footing and the government will also explore the possibility for the UK to participate in the EU's internal electricity market.

Ben Wilson, President of National Grid Ventures commented: "We strongly welcome this clear commitment to improve how we trade and collaborate on energy with Europe. Today is a positive step in the right direction to reduce trade barriers, reduce costs for UK and European consumers, and to maximise the benefits of secure homegrown energy in the North Sea."

The UK is one of Europe's largest producers of wind power and the deal will allow the country to export surplus electricity, while also reducing the costs of importing solar and nuclear power. This will in turn boost the nation's GDP, while increasing energy security.

EU proposes deadline to end Russian energy imports

The European Union has unveiled a plan for EU companies to end any remaining energy contracts with Russia by 2027 and instead source gas from elsewhere, including the US.

The strategy bans new contracts by the end of 2025 and mandates the termination of existing long-term agreements by 2027.

Dan Jørgensen, the EU Energy, insisted the plan would be effective and would end European energy dependency on Russia.

"It will also be legally feasible and something that member states will be able to support," said Jørgensen. He promised "new solutions" to enable companies to break their contracts.

Prior to Russia's invasion of Ukraine in 2022, the EU sourced more than 40 per cent of its pipeline gas imports and about 28 per cent of imported crude oil from Russia. The bloc's share has since dropped to about 13 per cent of gas imports, including liquefied natural gas (LNG), and less than 3 per cent of oil imports.

But despite the significant decrease in pipeline gas, the EU has increased its imports of LNG from Russia, with shipments hitting record levels last year.

According to officials, the Commission's plan is intended in part to signal to Washington that the EU is ready to buy more US LNG as part of a deal to reduce its trade deficit, officials have said.

Jørgensen acknowledged that this would be up to private companies, but said he was "in dialogue with quite a few", and US suppliers were "very eager and willing" to boost exports to Europe.

The Commission was "quite confident" that the EU could phase out Russian fuels in a way that would not hurt Europe's competitiveness or its citizens, he added. This would be done with the help of supplies from "Norway, [the] US, Qatar and certain north African countries", Jørgensen said.

He added that efforts backed by US investors to restart flows through the Nord Stream 2 pipeline that runs between Russia and Germany would not affect the Commission's aim of independence from Russian fuel.

A recent report by global energy market analytics provider Aurora Energy Research examined major geopolitical risks to global gas markets, the uncertainty of future European supply, and the ripple effect of tariffs on prices in the US, Europe, and Asia due to LNG rerouting.

The report highlights that a resumption of Russian pipeline gas would have a substantial impact on European energy prices, whereas tariff trade disruptions could subdue US growth, while offering mixed results for other regions.

At the start of this year, the five-year agreement between Ukraine and Russia expired, which had allowed Russian gas to be transported to Europe through pipelines in Ukraine. Aurora modelled various scenarios of Russian gas transport, comparing the baseline case with scenarios where the flow either fully resumes or is completely halted.

If Russian gas flows were to resume at pre-war levels, the European benchmark (TTF) gas prices would decline by 7 per cent in 2030-2060, alleviating market pressures across the region. A potential return of Russian pipeline supply would reduce the need for LNG imports, which have played a vital role in compensating for lost transit volumes through Ukraine. If access to more affordable Russian gas is restored, the importance of LNG will diminish significantly, particularly in Germany where demand could drop by 5-12 bcm/y, according to Aurora's assessment.

Gas turbine market could experience "turbo lag" in 15 years

A new report from Wood Mackenzie finds that despite surging power demand, the gas turbine market could experience "turbo lag" in the next 15 years due to manufacturing constraints, rising costs, and competition from renewables.

The report, titled 'Turbocharged vs turbo lag: The new landscape for gas-fired power', projects that around 890 GW of new gas fired generation capacity will be added globally between 2025 to 2040. Combined, China and the US average 47 per cent of global annual additions from 2025 to 2040. Other markets and regions, including Southeast Asia, India, and the EU27 range from 53 per cent of global annual additions from 2025 to 2040.

However, several factors may limit growth, particularly in the near-term, says the report.

Manufacturing capacity constraints could delay new gas plant construction. Wood Mackenzie calculates around 90 per cent utilisation of gas turbine manufacturing capacity in 2025, which could cause some US developers to find that 2030 or beyond is the earliest opportunity to bring new combined cycle capacity online.

In the US, skyrocketing capital costs and electricity market prices below the cost of new gas generation pose challenges.

In Asia, high imported gas costs limit gas to a peaking role despite strong power demand growth.

In Europe, decarbonisation goals are pushing unabated gas to the margins by 2040.

"While power markets will require natural gas fired power as part of the energy transition through 2040, gas's role will have limits," said David Brown, Director of Energy Transition Research at Wood Mackenzie. "High fuel costs in some regions, rising construction costs, and continued cost declines for renewables and energy storage will constrain gas's growth potential."

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Trump says yes to nuclear and coal


Photo by Danny De Vylder

- Executive orders could speed nuclear projects
- Coal plant closure dates and emissions limits lifted

Janet Wood

President Donald Trump has signed four executive orders in a bid to accelerate the development of nuclear power in the US and revamp the nuclear regulator, the Nuclear Regulatory Commission (NRC). Share prices of nuclear power companies rose after the announcements.

One order directed the NRC to streamline its rules, saying it had an "overly risk-averse culture", and approve applications for new reactors within 18 months. Jacob DeWitte, Chief Executive of nuclear power start-up Oklo, said that the executive orders provided an opportunity to "bring regulatory regimes back to what their intents were" adding, "we need to couple this with permitting reform".

Another order will pave the way for the Department of Energy (DOE) to build nuclear reactors on federal land and military bases, possibly alongside new data centres. That order could mean the new projects on DOE or Department of Defense land could bypass the NRC. Other executive orders would expand uranium mining and enrichment.

President Trump has previously declared a "national energy emergency," and tried to boost coal, oil and natural gas while cutting back support for renewable energy. But new nuclear reactors will be able to get a tax break if they begin construction by the end of 2028.

Meanwhile Trump's actions have also focused on boosting coal, oil and natural gas, with the President promising to protect the country's "beautiful clean coal industry".

The case for retaining these assets is boosted growing demand caused by electrification and the AI boom.

Nationwide electricity demand is forecast to increase by 15.8 per cent by 2029, according to consulting firm Grid Strategies.

"Everyone is talking about AI and the electrification of industry, but there's a lot less conversation about how to meet that power demand," said James Stevenson, coal, metals and mining research lead at OPIS, a data and analysis company. "We think it's going to be very hard to do so while moving away from coal."

The Federal Energy Regulatory Commission allowed Talen Energy Corporation to continue operating two Maryland coal plants until 2029, while the Chief Executive of the Tennessee Valley Authority said the utility was reconsidering plans to shut down its coal operations by 2035. In April, Indiana governor Mike Braun ordered utility and energy officials to explore extending the lives of coal plants in the state.

In addition, dozens of plants have had emissions limits softened. Michelle Bloodworth, Chief Executive of trade association America's Power, said: "What's changed with this administration is that they recognise the value of coal".

The Trump administration has said it will halt funding of $365 million awarded during the Biden administration for rooftop solar power in Puerto Rico and instead redirect it to fossil fuel generation and maintenance of infrastructure.

Puerto Rico suffers power outages including a recent blackout. Now US Energy Secretary Chris Wright has issued an emergency order under section 202(c) of the Federal Power Act, which effectively overrides federal and state environmental laws for a brief period to address an emergency shortage of electricity. It will allow Puerto Rico's state-owned utility to plug chronic electricity shortfalls on the island with electricity from oil-burning power plants without running foul of environmental laws.

The US Department of Energy said funding will be redirected away from solar power to fixes that can be deployed immediately "such as dispatching baseload generation units, supporting vegetation control to protect transmission lines and upgrading aging infrastructure". The administration of President Donald Trump has supported maximising the output of fossil fuels and dismantling policies by former President Joe Biden's administration designed to spur the use of renewable power.

"The redirection of these funds will expand access to reliable power for millions of people rather than thousands and generate a higher return on investment for taxpayers while advancing grid resiliency for Puerto Rico," the department said.

Chinese batteries for Chile's largest solar and storage project

China's BYD battery and electric vehicle maker will supply more than half of the battery storage capacity for Chile's huge Oasis de Atacama project.

Developer Grenergy has signed a fresh 3.5 GWh battery energy storage system (BESS) supply deal for the 11 GWh project with BYD. The two companies had previously signed a 3 GWh agreement in September last year, following a 1.1 GWh contract for the project's first phase.

Grenergy has claimed Oasis de Atacama, a multiple-phase solar PV and energy storage hybrid project in the Atacama Desert, will be the largest battery storage project in the world, with 11 GWh of storage alongside 2 GW of generation. Grenergy said that it recently closed €324 million financing for the fourth phase of Oasis de Atacama.

Meanwhile Grenergy has signed a new long-term green power purchase agreement (PPA) with offtakers in Chile, including state-owned copper producer Codelco and a global energy company in Chile. The contract stipulates the sale of 390 GWh of solar energy per year from Greenergy's projects in central Chile, through a daytime PPA that will come into force in October 2026. Of the total, 110 GWh per year will be supplied for 15 years and 280 GWh will be delivered for 12 years.

Ontario modular reactor to be first in "western world"

- Final approval to construct 300 MW BWRX-300 reactor
- Reactor expected to be online by 2030

Junior Isles

Officials in Ontario, Canada, have given final approval to construct a GE Vernova Hitachi Nuclear Energy small modular reactor (SMR), which the company predicts will be the first SMR operating in the "western world".

Construction of the 300 MW BWRX-300 reactor adjacent to Ontario Power Generation's existing Darlington Nuclear Station will produce enough energy to power 300 000 homes.

"Successful deployment at Darlington will demonstrate the feasibility and benefits of SMRs, encouraging broader adoption and investment in this transformative technology," GE Vernova Hitachi Nuclear Energy said in a statement.

Once built, it will be "the first of its kind in the G7", Ontario's energy ministry said in announcing the construction greenlight.

Early site preparation is complete and construction will start soon, GE Vernova said. The reactor is expected to be online by 2030.

Four units are eventually planned for the site and all are expected to be operating by 2035.

The total project cost for all the units would be CA$20.9 billion ($15.06 billion), Stephen Lecce, the province's energy minister, said. He noted that the planned reactors will help meet a predicted 75 per cent rise in Ontario's power demand by 2050.

"Ensuring that we have reliable, affordable energy is essential to the economic sovereignty of our province and country," Lecce said. He also noted that building the four reactors would bring up to 18 000 Canadian jobs and add CA$38.5 billion to Canada's GDP over the next 65 years.

SMRs promise standardised, replicable designs to prevent the one-off engineering problems that have plagued larger projects.

There has been significant interest in SMRs as electricity demand rises, with big tech companies inking preliminary deals with SMR developers to help meet AI-driven needs.

"As we confront the challenges of increased demand, energy security and carbon intensity, this milestone reaffirms our commitment to innovation and a more sustainable energy future," GE Vernova CEO Scott Strazik said in a statement.

Empire Wind construction to resume

Equinor's $5 billion Empire Wind project off the coast of New York is set to resume construction after the government reversed an order telling the company to halt construction. The Department of the Interior's Bureau of Ocean Energy Management had allowed the project to continue, following dialogue with regulators and federal, state and city officials, said Equinor.

Interior secretary Doug Burgum had ordered the stop to the project, accusing the Biden administration of rushing through the approval process. It followed an executive order from President Trump that paused permitting and leasing for onshore and offshore wind projects and ordered reviews of those that had been given the green light. Recently 17 US states and the District of Columbia launched legal action challenging the executive order.

Jens Stoltenberg, Norway's Finance Minister, told the *Financial Times* that he was "relieved" the Trump administration had taken a "flexible and constructive approach" to Equinor, which also has major oil and gas investments in the US. He added: "It is important because it helps to strengthen confidence in the US as a predictable country to invest in, not just for Equinor but for other companies too."

"Permit stability is an important part of attracting investment and seeing permits put in flux for established projects could be troubling for investors," commented Kevin Book, Managing Director of ClearView Energy Partners.

Equinor said it would perform an updated assessment of the Empire Wind project's economics in the second quarter and engage with suppliers and regulators to mitigate the impact of the stop-work order.

Billions of dollars at risk as EVN retroactively cuts subsidies

- EVN subsidiary withholds portion of payments
- Investors accused of tariff access abuse

Photo by Ammie Ngo

Syed Ali

Vietnam's state power utility EVN, has cut previously agreed subsidised prices it pays for electricity from some solar and wind farms, which now risk defaulting on their debts with banks.

According to an investors' petition seen by *Reuters* a number of signatories have warned that billions of dollars of investment is at risk because of retroactive changes to subsidies implemented by Vietnamese authorities.

Starting with January invoices, a subsidiary of EVN "unilaterally withheld a portion of its payments by applying a provisional tariff of its own proposal", the document said.

"This has caused us to breach commitments to banks and both local and international lenders, face the risk of default under pressure of monthly debt repayments, and suffer cash shortages," it added.

Vietnam has experienced a boom in renewable energy investments driven by generous feed-in tariffs (FiTs), under which the state committed to buying electricity for 20 years at above-market prices, effectively subsidising producers. However, amid allegations of abuses in accessing the FiTs and increasing losses for EVN from the subsidy programme, authorities have proceeded to freeze or cut some subsidies.

The letter is the second petition where many of the same signatories warned of the risk to investment. EVN had no immediate comment on the second petition but it has told *Reuters* that preferential prices could not be continued for projects that violated regulations. It did not specify whether rules were changed retroactively and which projects were in breach of regulations.

In early May Quảng Trị Province urged investors to speed up the implementation of stagnant wind projects, warning that continued setbacks could affect the province's economic development and commitments to national energy goals.

To date, eight out of 11 approved wind power projects with a total capacity of 424 MW are behind schedule. Only the Hướng Linh 4 wind power plant, with a capacity of 30MW, has completed construction and is finalising procedures for commercial operations.

The local authority said that the delays affect the investment climate and the 8 per cent economic growth target set for 2025, as well as goals for two-digit growth in the next few years.

Meanwhile Vietnam's planned massive expansion of renewables capacity continues to attract investors. Last month SK Innovation E&S Co., a South Korean provider of advanced renewable and clean energy solutions, said it is eyeing global expansion with the commercial operations of its offshore wind farm in Tân Phú Đông.

Located near the Mekong Delta, the 150 MW near-shore facility consists of 36 wind turbines, each with a capacity of 4.2 MW. The power generated is transferred via undersea cables to an onshore substation and then supplied to EVN.

In April, the Vietnamese government announced plans to raise the share of renewable energy to 75 per cent by 2050, highlighting its commitment to fostering green energy.

The government updated its revised National Power Development Plan (PDP VIII) – approved under Decision No. 768/QD-TTg dated 15 April 2025 – outlining ambitious targets to ensure national energy security and meet economic growth demands.

According to the Ministry of Industry and Trade, Vietnam will require an annual investment of around $16–18 billion dollars from now until 2035 to implement the revised plan.

India's solar installations slow

Photo by American Public Power Association

India installed 6.7 GW of solar capacity in the first quarter (Q1) of 2025 – a 25 per cent decrease year-over-year (YoY) compared to the 9 GW installed in Q1 2024, according to Mercom India's newly released 'Q1 2025 India Solar Market Update Report'.

Several projects slated for Q1 commissioning were postponed due to factors such as insufficient substation capacity and transmission infrastructure, land acquisition challenges, and delays in Power Purchase Agreement (PPA) signings. Additionally, a significant shortage of domestically manufactured modules, combined with elevated prices, created procurement hurdles for developers.

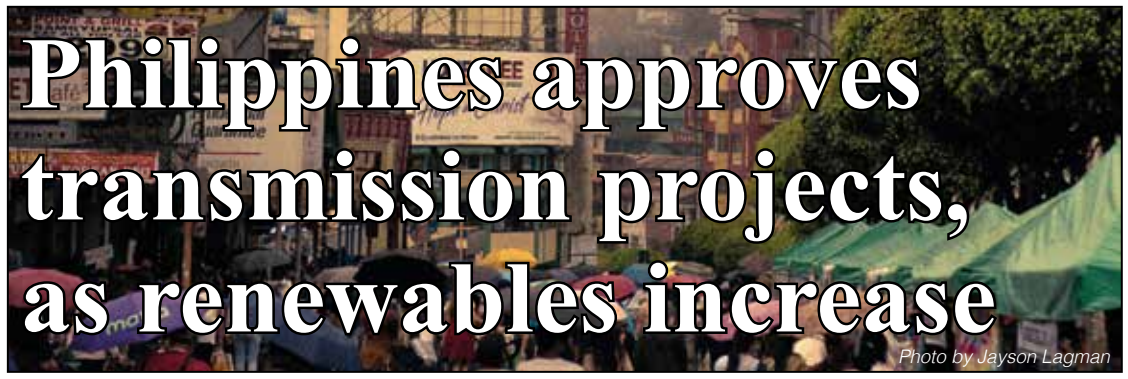
"Indian solar installations were off to a slow start in Q1. While the project pipeline for 2025 is strong, a shortage of domestic modules and persistently high prices remain key concerns" said Raj Prabhu, CEO of Mercom Capital Group. "Unless supply-side challenges are addressed quickly, project execution could stall. PPA and PSA (Power Service Agreement) signings continue to lag behind tenders, while land and transmission bottlenecks are slowing progress and delaying project commissioning."

In Q1 2025, India added 12.3 GW of new power capacity, with solar power accounting for 54 per cent of capacity additions.

As of March 2025, India's cumulative installed solar capacity stood at 104.6 GW. Solar energy accounted for 22 per cent of India's total installed power capacity and 48 per cent of the total installed renewable energy capacity. Large-scale solar projects contributed over 86 per cent and rooftop solar nearly 14 per cent to the cumulative installed solar capacity.

India added 25.2 GW of solar capacity in the calendar year (CY) 2024, bringing its cumulative installed solar capacity to 98.7 GW as of December 2024.

- Ciel & Terre Solar Private Limited has developed a 120 MWp floating solar photovoltaic power project in collaboration with L&T and SJVN Green Energy Limited. The project has been set up at Omkareshwar in Madhya Pradesh, India. It will supply power to Rewa Ultra Mega Solar Limited.



Philippines approves transmission projects, as renewables increase

Photo by Jayson Lagman

The Energy Regulatory Commission (ERC) has approved two transmission projects costing Peso32 billion ($570 million) that will support the growing amount of renewable generating capacity set to come onto the grid.

The approval, announced by the ERC in its latest notice of commission action, covers the capex projects under Group 3 application of NGCP (National Grid Corp. of Philippines) from 2020 to 2025.

The approved projects are the P18.823 billion Western Luzon 500 kV Backbone Project and the P13.2 billion Nagsaag-Santiago 500 kV Transmission Line Project.

The approved projects are the P18.823 billion Western Luzon 500 kV Backbone Project and the P13.2-billion Nagsaag-Santiago 500 kV Transmission Line Project.

The Western Luzon Backbone project aims to accommodate the incoming bulk generation entry in North Luzon; complement the proposed Balaoan-Laoag, Bolo-Balaoan and Santiago-Nagsaag 500 kV Lines, included in the Luzon Group 2 Projects for 2021-2025; and reinforce the 500 kV transmission network in Luzon, achieving a higher level of reliability and ensuring the security of the supply.

The ERC said the project should be completed by NGCP on or before October 31, 2027.

Meanwhile, the Nagsaag-Santiago Transmission Line Project, set to be completed on or before November 30, 2030 will cater the incoming capacities from hydro, geothermal and solar power plants in the provinces of Ifugao, Kalinga and Apayao.

Last month the Philippine government said more than 11 000 MW of clean energy capacity is expected to be online by 2030.

Solar photovoltaics remain the leading technology with 8431.19 MW of new capacity. Of this, 7399.73 MW is projected to be operational between this year and 2026, while 2233.24 MW of wind power is slated for commercial operations within 2025 and next year. Hydropower, geothermal and biomass are also seen to contribute 847.34 MW, 122.22 MW and 50.28 MW, respectively.

The Marcos administration has been encouraging investments in renewable energy as it hopes to cut dependence on coal. From the current 22 per cent share in the power mix, it aims to increase renewables to at least 35 per cent by 2030.

Although coal facilities are slated to provide an additional 1705 MW, the DOE earlier imposed a moratorium on new coal plants to cut carbon emissions and support the government's push to shift to clean energy. In early May, Ayala-led ACEN Corp. ramped up its push to retire a coal plant in Batangas ahead of schedule by joining forces with Japan's Mitsubishi Corp. and its unit, Diamond Generating Asia Ltd. (DGA).

The new partners are poised to strengthen ACEN's efforts to explore the use of transition credits in accelerating the early retirement of the 246 MW South Luzon Thermal Energy Corp. (SLTEC) coal plant.

Thai Power Development Plan to face further revision

Implementation of the much-delayed power development plan (PDP) may need to be further put back for a more careful revision to reduce long-term power supply in order to trim electricity bills, says the Thailand Development Research Institute (TDRI).

The PDP, set to take effect from 2024 to 2037, already sailed through public hearings held late last year but has yet to receive the final say from the National Energy Policy Council, chaired by Prime Minister Paetongtarn Shinawatra.

The plan must be reconsidered as it could lead to over-investment in new power plant development projects, though the country's power demand may not increase considerably over the next 13 years, said Areeporn Asawinpongphan, a research fellow on energy policy at the TDRI.

"It is not a good idea to push for the construction of 11 new large power plants – eight gas-fired power plants and three hydropower plants – in the PDP," she said.

"This would bring an unnecessary financial burden to electricity users," she noted.

Thailand's reserve power generation capacity stands at almost 38 per cent of the total installed generating capacity of 55 000 MW, Areeporn said.

Europe's governments turn to nuclear power

- Germany ends long-held opposition
- Denmark, Sweden and Spain debate merits of nuclear technology

Janet Wood

A series of decisions and announcements on new nuclear power across European countries have indicated a more positive attitude across the bloc to the technology.

Berlin's new government led by conservative Chancellor Friedrich Merz dropped Germany's long-held opposition to nuclear and signalled it will no longer oppose it in EU legislation.

"The Germans are telling us: we will be very pragmatic on the issue of nuclear power," said a senior French diplomat involved in the talks. This meant that "all the biases against nuclear power, which still remain here and there in EU legislation, will be removed".

Merz had criticised his predecessor Olaf Scholz for shutting down Germany's last three nuclear power stations when the country was grappling with high energy prices and vowed to invest in new technologies, including small modular reactors (SMRs).

Denmark is also looking at whether to end its 40-year ban on nuclear. Lars Aagaard, Denmark's Minister for Climate, Energy and Utilities, told Danish newspaper *Politiken* that the government would take a year to analyse the pros and cons, but four opposition parties keen to move faster have already tabled a debate.

Anders Fogh Rasmussen, Denmark's former Prime Minister, told the *Financial Times* he was in favour of lifting the "ridiculous" ban. He said: "Wind and solar are good as long as you have wind and sunshine. But you have to have a non-fossil base load and it's ridiculous to exclude nuclear power in advance."

Neighbouring Sweden still has three plants in operation. Now the parliament has passed a bill to finance 5 GW of new nuclear, either as four large-scale reactors or a fleet of small modular reactors (SMRs). "It's a question guaranteeing Swedish jobs, for dealing with climate change and it's a question of Sweden's security," Financial Markets Minster Niklas Wykman said during a parliamentary debate.

Meanwhile in Estonia, Fermi Energia welcomed a recent government decision to initiate a spatial planning process and Strategic Environmental Impact Assessment for a 600 MW nuclear plant. It will use GE Hitachi's BWRX-300 small modular reactor technology.

"The Estonian government's approval to begin planning for a 600 MW nuclear power plant, following Fermi Energia's proposal using GE Hitachi's BWRX-300 small modular reactor technology, represents a significant step forward in Estonia's nuclear energy development," said Fermi Energia's CEO Kalev Kallemets.

Finally, energy officials in Spain questioned the country's plans to shut down all seven of its nuclear reactors by 2035, saying the country's recent blackout showed that decision could put its power supply at risk.

Offshore wind projects hit by rising costs and supply chain issues

- Investment decision for Polish projects
- Delays and cancellations hit North Sea

Janet Wood

Equinor and Polenergia have taken a final investment decision for the Bałtyk 2 and Bałtyk 3 wind farms offshore of Poland, totalling 1.44 GW.

The wind farms will be built in the Polish Exclusive Economic Zone of the Baltic Sea, 37 km and 22 km off the coast. Each project will have 50 Siemens Gamesa SG 14-236 DD wind turbines.

"Bałtyk 2 and Bałtyk 3 represent some of the largest infrastructure projects in Poland's history. Their execution will significantly enhance the country's energy security and independence while creating jobs in a developing sector," said Michał Jerzy Kołodziejczyk, Country Manager of Equinor in Poland. "Furthermore, the renewable energy generated from our projects will bolster the competitiveness of the Polish economy,"

Elsewhere, the offshore wind industry has grappled with skyrocketing costs, higher interest rates and supply chain bottlenecks.

Previously Denmark said it would halt all ongoing offshore wind tenders to revamp its model, saying that a framework where no subsidies were offered did not work under existing market conditions. Now it has announced offshore wind tenders with a capacity of 3 GW, which will involve subsidies of up to $8.32 billion.

The three tenders will cover two areas in the Danish North Sea and one in the waters separating Denmark from Sweden. Completion of the wind farms is expected by 2032 and 2033, respectively.

"We need more secure green power and energy to make Denmark and Europe independent of energy from Russia," said Energy Minister Lars Aagaard.

The Netherlands recently decided to postpone tenders for two offshore wind farms totalling 2 GW due to a lack of interest from potential bidders. The tenders had been planned for September. The government said it would now only open a tender for one location in the North Sea with a capacity of 1 GW. The Netherlands last year pushed back plans to increase offshore wind capacity from 4.7 GW to 21 GW to the end of 2032 instead of 2030, citing costs, supply chain difficulties and "challenges in timely decision-making".

In the UK, meanwhile, Ørsted announced recently that it is putting its Hornsea 4 offshore wind farm project on hold.

RenewableUK Deputy Chief Executive Jane Cooper said: "The unique cost pressures faced by Hornsea 4 have led to a rethink on this particular project, and we need to do everything we can to keep a stable market for all other projects going forward."

Incremental capacity increases have got the go-ahead, however. The Crown Estate announcement that it is going ahead with a Capacity Increase Programme, adding 4.7 GW of new capacity in total to seven offshore wind projects.

European Hydrogen Bank to fund 15 projects

Fifteen hydrogen projects from across the EU will share €992 million in funding, the European Commission has announced. The projects were the winners in a competition for funds from the European Hydrogen Bank. The projects are set to produce 2.2 million tonnes of renewable hydrogen over 10 years.

Lobby group Hydrogen Europe said the selected projects span strategic sectors such as transport, chemicals, methanol, and ammonia production.

The European Hydrogen Bank is funded with revenues from the EU Emissions Trading System (ETS), and is intended to help bridge the gap between renewable hydrogen production costs and current market prices, accelerating the deployment of cleaner energy alternatives.

Hydrogen Europe said most projects asked for support of less than 0.5 €/kg, confirming the values from the first auction.

Eight projects in Spain won funding, with three in Norway, two in Germany and one each in the Netherlands and Finland.

Each subsidy for the 15 projects ranges from €8 million to €246 million over a period up to 10 years. The projects have still to proceed to Final Investment Decision.

"The winning projects in Germany and the Netherlands, being the largest, are a positive market signal, demonstrating that economies of scale and being close to industrial demand favours project development," said Daniel Fraile, Chief Policy & Market Officer at Hydrogen Europe.

Co-operation agreed around Baltic and North Seas

Energy ministers have signed new cross-border memorandums in the Baltic and North Sea regions.

The Baltic Energy Market Interconnection Plan (BEMIP) High-Level Group have signed a new Memorandum of Understanding (MoU) with the aim of improving the region's energy security and create a more efficient and unified energy market.

To achieve these goals, the group of energy ministers have agreed to invest in and collaborate on energy infrastructure projects, specifically regional interconnections.

The MoU also emphasised the need for greater cooperation to protect critical infrastructure against cyber and physical threats.

European Commissioner for Energy and Housing Dan Jørgensen commented: "The MoU will accelerate regional cooperation on interconnectors enhancing our energy security and resilience and step up joint work to protect our critical energy infrastructure, including undersea cables. This is even more vital in the current geopolitical circumstances, when boosting energy independence and security is an absolute must."

The BEMIP High-Level Group is composed of the European Commission, Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden. Norway is an observer.

Meanwhile Norway has launched a new Green Industrial Partnership with the UK. The agreement cements plans for joint investment and innovation in offshore wind, hydrogen, carbon capture and storage (CCS), and green infrastructure.

UK Energy Secretary Ed Miliband said: "This partnership is about building clean power we can rely on – backed by strong alliances, not fossil fuel volatility."

Wave and tidal projects on test at sea

Wave energy developer CorPower Ocean has signed a berth agreement to build a 5 MW wave energy project at the European Marine Energy Centre (EMEC) in Orkney, Scotland – the company's second project at EMEC.

Scheduled for deployment in 2029, the 5 MW array is expected to become the UK's largest wave energy project. It will consist of 14 wave energy converters that will operate for up to 15 years.

Each converter has a 9 m-diameter spherical composite hull which drives the movement of the power take-off as it responds to passing waves. It has a storm protection system that locks down the device during extreme conditions and enables safe offshore access for maintenance.

Anders Jansson, Head of Business Development at CorPower, said: "EMEC and Orkney offers significant know-how and an established supply chain, reducing risk and cost for the project," adding that the UK's renewable auctions will be key in providing a route to market.

Meanwhile Minesto has upgraded its Dragon 12 MW tidal kite "Luna", under test in the Faroe Islands.

"The initial electricity production with the updated tether looks promising and in line with our expectations. We are excited to continue our testing, and satisfactory to keep pushing forward in production mode", said Chief Executive Martin Edlund.

Floating offshore wind developers feel the strain

Photo by Pramod Kumar Sharma

- Slow progress and investment hurdles stifle development
- Industry expects less than 3 GW online by 2030

Nadia Weekes

Offshore wind developers are starting to retreat from floating projects as near-term growth expectations fall and confidence dips across the value chain, according to research from specialist consultancy firm Westwood Global Energy Group.

In a poll of 166 stakeholders across the global floating wind value chain, Westwood found that despite positive momentum in 2024, including new leasing rounds and subsidy announcements, the industry is adopting a cautious stance due to delivery delays, investment risk and sluggish policy implementation.

Developers have moved from being the most optimistic group in the 2024 survey to being the least confident now. Overall, 72 per cent of respondents anticipate less than 3 GW of global floating offshore wind capacity to be operational by 2030.

High upfront capital costs and limited investor confidence were seen as the most prominent financial barriers. Among non-financial hurdles, port infrastructure, lack of technology standardisation and insufficient government support dominate.

"Progress is happening, but too slowly. The frustration across the sector stems from knowing that momentum exists but the pace is out of sync with expectations," said Bahzad Ayoub, Manager Offshore Wind at Westwood.

The survey showed a strong correlation between perceived market leadership and government policies. France, UK, and South Korea were identified as the top three countries in floating wind, aligning with the presence of subsidies and strong policy signals.

Oman plans five-year electricity transmission boost

Photo by Hamayoon Pacha

State-owned Oman Electricity Transmission Company (OETC) has unveiled plans to invest in network expansion and modernisation projects supporting the country's clean energy and industrial growth strategies.

As many as 51 key projects have been identified by OETC for implementation by 2029 to enable the transmission system "to meet the future growth in demand, connect new generation from renewable energy and conventional resources, connect new rural areas, and meet the Transmission Security Standard", Chief Executive Saleh bin Nasser Al Rumhi said in OETC's latest statement on transmission capability.

Targeted for grid connection over the next five years is 500 MW of capacity at Ibri Solar III, 280 MW at Al Kamil Solar and another 500 MW each at two proposed sites in the Al Sharqiyah North and South Governorates.

In parallel, several wind farms are to be integrated into the national grid, including the 100 MW JBB Ali project and a 120 MW expansion of the existing 50 MW Dhofar I wind farm. Other wind projects such as Ras Madrakah (250 MW) and Mahout (350 MW) are planned for connection in Q2 2027.

Two gas powered plants – Misfah (1600 MW) and Duqm (800 MW) are also slated for grid connection in 2027 and 2028, respectively. Meanwhile, Phase 2 of the strategic North-South Interconnector Project (Rabt) is due for completion by Q4 2026.

Meanwhile, Sembcorp Utilities has announced the start of commercial operations at the 588 MW Manah II Solar power project, marking the beginning of a 20-year power purchase agreement with Nama Power and Water Procurement Company (Nama PWP).

In a separate development, Nama PWP is looking to exploit the energy potential of hot springs in a stretch of northern Oman that is popular for its tourist and therapeutic appeal.

Nama has invited consultancy firms to bid for a contract to investigate the hot springs' geothermal energy potential. According to studies by Sultan Qaboos University, Oman hosts a few geothermal reservoirs that could be further explored.

Solar generation set to eclipse nuclear for the first time

Global electricity generation from solar farms is set to exceed output from nuclear reactors for the first time this summer, *Reuters* reports.

As solar farms only generate power during daylight, their output remains well behind wind, nuclear and hydro systems on an annual basis. But solar farms can exceed output from nearly all other clean sources during peak production months.

In Q1 2025, solar generation was one-third higher than in Q1 2024, thanks to increases in generating capacity in several key regions. If it continues to grow at this rate, global solar electricity output should exceed 260 TWh per month during June, July and August of this year, surpassing the monthly output from the world's nuclear reactor fleet of 223 TWh in 2024.

Over the last ten years, utilities have added more than twice as much solar capacity to their generation networks as any other power source, thanks mainly to the relatively low cost and speedy connection times of solar energy systems.

According to energy think-tank Ember, global utility-scale solar generation capacity reached nearly 1.9 TW at the end of 2024 – ten times what it was in 2014. Over the same decade, wind power grew by a factor of 3.2, while the installed capacity of all other generation sources less than doubled.

The rapid rise of solar generation is forcing utilities to modernise their grids to better accommodate the intermittency of renewables. A growing number of utilities are deploying batteries to store surplus solar power when it is not required and dispatch it when electricity consumption peaks.

This 'solar-plus-battery' model is allowing utilities to cap the use of fossil fuels in their generation mixes, and to dial back nuclear production during peak solar output periods.

Hydrogen cooperation urged between Europe and Latin America

Hydrogen Europe and LAC Clean Hydrogen Action have signed a memorandum of understanding (MOU) to promote the deployment, uptake and trade of clean hydrogen and its derivatives across both regions.

"This agreement reflects our shared belief that hydrogen is a global opportunity, said Daniel Fraile, Chief Policy and Market Officer at Hydrogen Europe. "By connecting Europe and Latin America business communities, we can tackle regulatory challenges, foster innovation and unlock new markets."

Mónica Gasca, General Secretary of LAC Clean Hydrogen Action, added: "Latin America and the Caribbean have vast renewable energy resources and a strong commitment to sustainable development. This alliance opens new doors for knowledge exchange, green hydrogen trade and long-term cooperation between our regions."

The MOU outlines joint efforts in areas such as regulation, certification, skills development, infrastructure, innovation and green corridors. It also includes coordinated participation in global climate negotiations and other international initiatives instrumental to the deployment of clean hydrogen.

The partnership marks a key milestone in strengthening the EU-LAC hydrogen agenda.

Iraq closes 'first-of-its-kind' integrated energy project

- Integrated project to combine O&G production with power generation
- Agreement signed to bolster electricity grid capacity

Nadia Weekes

Iraq's oil ministry has signed an agreement with an Iraqi-Chinese consortium to deliver the Gas Growth Integrated Project, combining upstream oil and gas production with downstream refining, petrochemicals and power generation.

The fully integrated project, located in the southern province of Basra, will recover flared gas at three oil fields to supply gas to power generation plants. A 650 MW thermal power plant and a 400 MW solar power plant will also be part of the project, Iraq's Oil Minister Hayan Abdel Ghani said.

The first-of-its-kind deal "represents a qualitative leap in developing oil wealth and supporting the national economy", the minister said, adding that the project will contribute to economic development and job creation.

Bassim Mohammed Khudhair, Deputy Minister of oil for extraction affairs, called the deal a "major achievement" and said that other projects of this kind are currently "under study and discussion".

In 2023, Iraq signed a deal with French company TotalEnergies to develop oil and gas and renewable energy projects in the south worth $27 billion.

Iraq holds a 30 per cent stake in the joint venture, while 45 per cent is held by TotalEnergies and the remaining 25 per cent by QatarEnergy.

In a separate development, Iraq signed an energy cooperation agreement with Germany's Siemens Energy to bolster the country's power grid capacity. The agreement includes building new power plants with a capacity of 14 GW, as well as maintenance contracts for the Dibis gas power plant and Al-Mussaib thermal power plant.

Decades of conflict and instability have severely hampered the development and maintenance of Iraq's electricity infrastructure, leaving the oil-rich country grappling with chronic power shortages.

Meanwhile, Iraq's first fully off-grid, solar-powered community, the Kulak Solar Village, has been inaugurated in the Kurdistan region.

"A model of innovation integrating renewable energy systems, sustainable agriculture and climate adaptation practices, the project proves that we can protect our environment, empower our people, and build a future rooted in resilience, dignity and hope," said Idris Nechirvan Barzani, Founder and President of the Rwanga Foundation.

Solar energy provides round-the-clock electricity to the Kulak Solar Village. Solar-driven irrigation might also be possible, and there are plans to provide hands-on training programmes in regenerative agriculture. Plans are underway to expand the model across Kurdistan and central Iraq by 2030.

The UN ranks Iraq as the fifth most vulnerable country to the impacts of climate change.

Ørsted returns "solid" operational performance despite challenging environment

■ Q1 operating profits hit DKK8.9 billion ■ Sector faces "short-term headwinds"

Junior Isles

Danish multinational energy company Ørsted has recorded "solid" first quarter operational earnings, despite ongoing challenges in the offshore wind sector.

Operating profit (EBITDA) for the first quarter amounted to DKK8.9 billion ($1.3 billion) compared to DKK 7.5 billion in the same period last year. EBITDA excluding new partnerships and cancellation fees in Q1 2025 amounted to DKK8.6 billion, an increase of 14 per cent compared to the same period last year.

Earnings from offshore sites amounted to DKK7.7 billion, which was an increase of DKK 0.7 billion compared to the same period last year. The increase was due to the ramp-up of generation at its German offshore wind farm Gode Wind 3 and higher availability. This was partly offset by significantly lower wind speeds in the quarter.

Profit for the period totalled DKK4.9 billion, an increase of DKK2.3 billion compared with Q1 2024. Return on capital employed (ROCE) came in at 4.6 per cent. ROCE adjusted for impairment losses and cancellation fees in Q1 2025 was 10.2 per cent.

Ørsted maintains its full-year EBITDA guidance of DKK25-28 billion excluding earnings from new partnership agreements and impacts from cancellation fees. Furthermore, it maintains its gross investment guidance of DKK50-54 billion.

Commenting on the interim report for the first quarter of 2025, Rasmus Errboe, Group President and CEO of Ørsted, said: "I'm pleased with our operational performance and earnings in Q1 2025, and we remain fully focused on the execution of our four strategic priorities. During the quarter, we had solid operational earnings supporting our full-year guidance, and we continued to deliver on our farm-down programme by completing offshore and onshore farm-downs.

"We also continued to deliver on our construction portfolio as we commissioned our offshore wind farm Gode Wind 3 in Germany, reaching more than 10 GW of installed offshore capacity."

Ørsted noted that the offshore wind industry is challenged in the short term with headwinds relating to supply chain, regulatory, and macroeconomic developments, and said it is following the developments in the regulatory landscape closely and continuously assess any potential impacts.

Ørsted recently took the decision to discontinue the development of the Hornsea 4 project in its current form, well ahead of the planned FID later this year.

"The combination of increased supply chain costs, higher interest rates, and increased execution risk have deteriorated the expected value creation of the project," said Errboe.

The company maintains, however, that the long-term fundamentals for offshore wind are strong due to the increasing global electricity demand, a strengthened focus on energy security and affordability through renewables, and improved framework conditions in several major markets.

Demonstrating his confidence in the market, Errboe reported: "We expanded and strengthened our Group Executive Team and welcomed two strong profiles in Amanda Dasch and Godson Njoku, who'll add valuable competences and bring decades of senior leadership experience from the energy industry."

Record turnover for Jan De Nul in 2024

Photo by Pau de Valencia

World Builder Jan De Nul has achieved a record turnover for the third year in a row. In 2023, turnover increased by 18 per cent compared to 2022. In 2024, it went up by 36 per cent. The company, which has activities in offshore energy, reached the €4 billion mark for the first time.

The landmark figure compares to a turnover of just under €3 billion in 2023. At €777 million, EBITDA is also up 27 per cent, while net profit is up 38 per cent, to €409 million.

Jan Neckebroeck, CFO at Jan De Nul, said: "Jan De Nul can report a fantastic year in terms of results, despite geopolitical tensions and economic uncertainties. This gives us confidence for the future, as global tensions, reinforced with growing protectionism, continue into 2025."

The company saw growth across its four main activities: Offshore Energy, Dredging Solutions, Construction Projects and Planet Redevelopment. Dredging and offshore energy projects accounted for 77 per cent of Jan De Nul's turnover.

The construction of offshore wind farms and the installation of submarine cables to bring green energy ashore are "on the rise", the company said. Jan De Nul's dredging activities also continued to do well, including the construction of new ports in Spain, Senegal and India.

The company's various construction and redevelopment projects account for 23 per cent of its turnover. Examples include the Oosterweel link, the new traffic complex near Brussels Airport and the energy island in the Belgian North Sea.

At the end of 2024, the order book stood at €9.55 billion – once again a record, giving the company confidence for the future. This is also reflected in the major investments Jan De Nul made in 2024. The company again ordered an extra-large vessel to install subsea cables, a first plug-in hybrid dredger and it is strongly committed to the electrification of its onshore machinery.

"Despite all our investments, we can present a negative net debt. This financial strength is important for our company, as it allows us to further invest in the most innovative fleet and progressive land equipment," said Neckebroeck.

Companies plan shift to green energy despite US rollback on renewables

Over half of almost 1500 business leaders of medium and large companies plan to relocate their operations within five years to better access renewable sources, a survey carried out across 15 countries has found, and nearly all of them backed a long-term shift away from fossil fuels.

The findings were based on interviews carried out between December and February with about 100 C-suite executives from each of the countries since US President Donald Trump regained office.

Since taking office in January, Trump has launched a sweeping attack on climate policies in the US, while his threatened tariffs have sparked fears of a global trade war that could push the cost of the energy transition higher.

The research said that while US policy emphasised fossil fuel expansion, 97 per cent of the American executives polled wanted to see the government expand renewable electricity in the grid.

Liz Minné, Director and Head of Global Sustainability at Interface, the US flooring company, said the polling showed that "global businesses understand the urgent need to shift from fossil fuels to renewables."

While participation in the survey, which included the US, UK, Germany, Brazil and India was anonymous, Iberdrola, Natura and Schneider Electric were among those to lend their backing to the findings, the *Financial Times* reported.

"A rapid shift from fossil fuels to renewable power and electrification makes strong business sense and ensures energy security and resilience," said Iberdrola's Global Director of Climate Change and Alliances, Gonzalo Sáenz de Miera.

More than three-quarters of businesses surveyed supported a shift to a renewables-based electricity system by 2035 or sooner.

Some 52 per cent of those polled said they would move their operations and 49 per cent would shift supply chains to better access renewables-based power systems within five years, if their home market lacked green energy. This figure jumped to 89 per cent of senior executives within ten years.

"If enacted, such measures could have huge ramifications for countries' international competitiveness and domestic revenues," the research said.

Americas

Candu Energy secures supply of heavy water

Candu Energy, a subsidiary of AtkinsRéalis, has signed an Memorandum of Understanding (MOU) with the National Atomic Energy Commission (CNEA) of Argentina to produce heavy water.

The MOU provides for the restart of the Industrial Heavy Water Plant (PIAP) in Neuquén, Argentina, along with the long-term acquisition of its heavy water output. It also provides for planning related to the establishment of one or more similar heavy water production facilities in Canada.

This will support the operation of existing CANDU nuclear reactors and the commissioning of new units globally.

The PIAP is owned by CNEA. Originally commissioned around 30 years ago, the facility has supplied Argentina's CANDU reactor, as well as exported heavy water to various countries. The facility is expected to resume operation as early as 2027. Following basic refurbishment work supported by AtkinsRéalis, it will provide an immediate near-term supply for CANDU reactors.

Condition assessment contract for Brazil's grid

Arkion has been selected as the exclusive provider of AI-powered condition assessments of power grid infrastructure for Energisa, one of Brazil's largest distribution grid operators. Over a three-year period, Arkion will deliver condition assessments for 2.5 million transmission and distribution structures.

The analytics will enable Energisa to detect defects earlier, mitigate risks, and optimise long-term investment strategies.

Gustavo Valfre, VP Technology with Energisa, said: "This collaboration marks a significant step in ensuring a more reliable and efficient energy network in Brazil. We're confident in building a stronger Brazilian power grid, fit for the future."

MAN to supply gas engines to Texas

The Kerrville Public Utility Board (KPUB) has selected MAN Energy Solutions to supply six 18V51/60G gas engines, providing a total capacity of 124 MW, to be used in a peaking power plant in Texas, USA.

The engines are scheduled for delivery in mid-2026, with operation starting in 2027. The engines will use natural gas, but will also be able to use synthetic methane, biofuels, and hydrogen-blends.

MAN Energy Solutions will also provide engine and plant-specific systems and components, and will handle the transport of the engines to the site.

Asia-Pacific

AFRY advisor for Quezon wind farm

AFRY has won a contract to supply lender's technical advisory services for the Quezon North Onshore Wind Power Project, which is set to become the largest onshore wind farm in the Philippines. The project has a planned capacity of 344.5 MW.

Once fully operational, the facility is expected to generate approximately 1100 GWh of renewable energy annually.

ACEN, the energy arm of the publicly listed Philippine conglomerate Ayala Group, has secured financing from the Bank of the Philippine Islands, BDO Unibank, and Rizal Commercial Banking Corporation to support the development of this project.

LS Marine Solution cables for Taipower

LS Marine Solution of South Korea has won a €13.8 million contract to lay submarine cables for the 300 MW Taipower Offshore Wind Project Phase II (TPC Changhua Phase II) in Taiwan.

The contract is LS Marine Solution's first win in overseas power grid projects and the first overseas expansion for a Korean submarine cable contractor.

The first jacket foundation has already been installed at the site located approximately 14.7 km west of Lukang in Changhua County.

Byung-ok Kim, CEO of LS Marine Solution, said: "Based on our technology and experience as the first-generation submarine cable construction company in Korea, we have successfully taken our first steps into the overseas power grid market. With this Taiwan project, we will further expand our global reach."

SGCC orders first SF_6-free 550 kV GIS

Hitachi Energy has won a contract to supply the world's first SF_6-free 550 kV gas-insulated switchgear (GIS) to the Central China Branch of the State Grid Corporation of China (SGCC).

An official from the Central China Branch of SGCC said: "This project is the world's first pilot application of 550 kV SF_6-free GIS, which is of great significance to the Central China Branch of SGCC and will contribute to the clean transformation of the electrical industry to achieve the dual carbon goals."

Replacing SF_6 will help protect the environment because it has a global warming potential over 24 000 times higher than CO_2 and remains in the atmosphere for over 1000 years if it leaks from the equipment.

EVN awards €30 million UHV cable contract

LS Eco Energy, through its Vietnamese production subsidiary LS-VINA, has won a contract for €30 million of UHV cables for Vietnam Electricity (EVN)'s power grid construction project. This represents about 5 per cent of LS Eco Energy's annual sales for 2024.

The project involves construction of a national power grid connecting substations in Hanoi's city centre and suburbs to enable stable supply to the rapidly increasing demand in urban areas. Vietnam plans to expand its current power generation capacity from 69 GW to over 150 GW by 2030, as well as constructing 16 285 km of a new 220 kV transmission network.

Europe

SF_6-free substations for Norway grid

GE Vernova won a contract to supply two 420 kV SF_6-free gas-insulated substations (GIS) from Statnett and Equinor. The contract covers the design, supply, and installation of GIS units at Skaidi and Hyggevatn as part of Statnett's 420 kV transmission line project to support Norway's energy transition and decarbonisation effort.

The Skaidi substation involves upgrading the existing facility, while the Hyggevatn substation will be a completely new installation. Together, they aim to modernise Norway's electrical grid, increase capacity, and electrify Melkøya Island, home to Equinor's Snøhvit gas field and Hammerfest LNG plant.

The design of these substations will be based on GE Vernova's g³ technology, which replaces SF_6 gas, a potent greenhouse gas commonly used in high-voltage equipment.

Statnett's Skaidi and Hyggevatn substations are expected to become operational by 2029.

JV to develop AW2 battery project

SAE and Econergy International have formed a joint venture to co-develop the Afon Wysg 2 (AW2) 250 MW Battery Storage project at SAE's Uskmouth Sustainable Energy Park (USEP).

The project will be designed for a duration of up to five hours, with a total capacity of 1250 MWh. The project aims to achieve planning permission within the next 12 months and financial close in 2027.

The AW2 project will be the third battery storage project at the USEP, which is one of the leading battery storage sites in the UK, with over 1 GW of projects either in construction or development.

Nordex wins 49 MW German wind farm order

Nordex has won an order from GETEC green energy for seven N163/6.X wind turbines for the 49 MW Zerbst wind farm in Saxony-Anhalt, Germany. The order also includes a 20-year service agreement.

GETEC is expanding an existing wind farm on a former military airfield in the city of Zerbst. Nordex will install the Delta4000 series turbines on 164 m high hybrid towers from summer 2026.

ITM Power to supply Humber electrolysers

Uniper has awarded a contract to ITM Power to supply the electrolyser for its Humber H2ub (Green) project at the Killingholme site in the Humber, UK.

ITM will provide Uniper with the engineering package for 120 MW of installed electrolyser capacity, comprising of six 20 MW POSEIDON units. The full supply agreement will be signed following the engineering phase and a successful Uniper financial decision for the project.

Uniper's plans for the proposed Humber H2ub include green hydrogen production capability with an installed electrolyser capacity of 120 MW with potential for future expansion of a further 200 MW+. The project is scheduled to be operational by 2029.

International

Tender for Ukraine gas engine plants

The European Bank for Reconstruction and Development (EBRD) and JSC Ukrzaliznytsia (Ukrainian Railways) have announced a tender for the purchase of container gas engine power plants for Ukraine, each of a capacity of 1.8-3.5 MW, for a total capacity of 215 MW, using EBRD loan funds and grant financing.

Ukrzaliznytsia plans to gain a loan of €180 million from the EBRD to finance the supply and installation of small gas fired power plants with a total generation capacity of up to 270 MW.

The UK will provide a grant of £10 million through the Ukraine Energy Support Fund. Ukraine also hopes to attract €56 million in grant funding.

As a result of this project, Ukraine's rail sector will be able to continue to operate even through blackouts caused by Russian missile and drone strikes.

Doosan equipment for Saudi Arabian GTCCs

Doosan Enerbility has won contracts to supply key equipment for two large-scale gas turbine combined cycle (GTCC) power projects underway in Saudi Arabia.

It will supply steam turbines and generators for the Ghazlan 2 Expansion and the Hajar Expansion gas fired power plants, both located in the eastern region of Saudi Arabia. The total value of these agreements is approximately €220 million.

The contracts were signed with a joint EPC consortium formed by Spain's Técnicas Reunidas and Egypt's Orascom.

Both power plants will have a capacity of 2900 MW and are scheduled for phased completion by 2028. Doosan Enerbility will supply a total of four steam turbines and generators – two 650 MW units and two 540 MW units.

In addition, Doosan Enerbility has won an €80 million project in Saudi Arabia to upgrade the 1375 MW Yanbu 2 power plant from oil fired to a gas fired facility. Doosan Enerbility will supply key equipment such as combustors and distributed control systems by 2028 and will oversee commissioning. Once the fuel switch is complete, the Yanbu 2 plant is expected to maintain its existing power generation capacity while cutting carbon emissions by about 25 per cent.

Wärtsilä gas engines for 30 MW Lagos plant

Elektron Energy has awarded a contract to Wärtsilä for the supply of power generation equipment for a new 30 MW power plant on Victoria Island in Lagos. Wärtsilä will also operate and maintain the power plant for five years, as well as the EPC contract.

The facility will comprise three Wärtsilä 34SG gas engine-generator sets with related auxiliaries and is configured to accommodate an extension with one additional engine-generator set at a later stage.

Clearing and preparation activities at the site are due to be completed by the end of Q2 2025, when construction can start. Commissioning is expected 15 months after the start of construction.

The project is a first of its kind for Nigeria and is expected to serve as a model to enable similar power projects in the country.

Iraq signs 14 GW deal with Siemens Energy

The Iraqi Ministry of Energy has signed an agreement with Siemens Energy to develop 14 GW of new gas-fired generation capacity in Iraq.

The agreement, which marks the third phase of Iraq's energy partnership with Siemens, includes construction of combined cycle plants, which will primarily use local natural gas, including gas currently flared during oil production.

In addition, Iraq and Siemens Energy have signed agreements to renovate and upgrade the 340 MW Dibis power plant and rehabilitation of the 750 MW of existing units at the Al-Musayyib power plant, along with the addition of 150 MW at this plant.

Hydrogen

Western Australia embarks on major 30-year green hydrogen project

Australia is about to embark on a major green hydrogen production project that could establish the country as a regional renewable energy hub. It will take an estimated 30 years, plus an estimated A$100 billion ($65 billion) to complete, but the project could serve as a model for future projects globally.

Gary Lakes

Three major investors – Intercontinental Energy, Mirning Green Energy, and CWP Global have recently applied to Western Australia's Environmental Protection Authority (EPA) to build an energy plant that when complete will be massive. The Western Green Energy Hub (WGEH) is expected to make a huge impact not only on the hydrogen sector in Southeast Asia and on the landscape and society of southern Western Australia, but also on the production and global distribution of green hydrogen and green ammonia.

The project is designed to produce 70 GW of renewable energy per year when it is finished after seven different stages of construction over a 30-year period. The WGEH project cost is estimated at A$100 billion ($65 billion). Following approvals, a final investment decision (FID) is planned for 2028 and work commissioned to start in 2030.

First stage production will begin in 2032 with an initial capacity to generate 50 GW of renewable energy. Furthermore, with the support of newly announced Australian government hydrogen incentives, WGEH will drive down green ammonia production costs to under A$1008 ($650) per tonne.

Hydrogen production is set to for an annual capacity of 4 million tons of renewables-based hydrogen, ammonia production is targeted at 22 million tons per year.

The infrastructure will consist of some 3000 wind turbines, each with the capacity to generate 20 MW, and as many as 35 solar PV farms comprised of 6 million solar panels. The hydrogen electrolyser system will use centrally-located electrolysers, substations, compressors, and storage facilities. Coastal and marine facilities will consist of a desalination plant, marine offloading facility, and an offshore ammonia export pipeline.

The project is expected to have a significant positive impact on the economy of Western Australia. It will create fundamental reserve facilities, such as data centres, workshops, and a workers' village that will accommodate up to 8000 residents. Major job creation is another anticipated plus, but most importantly, WGEH will significantly reduce global carbon emissions and align Australia with international goals for a sustainable energy future.

Commentators on the project say the facility will make Australia's mark on the future of renewable sustainability as it progresses the global transition to renewable energy solutions. Short of newer, larger projects being proposed in the future, WGEH could become the world's largest and most cost-efficient green hydrogen hub.

Located on the Nullarbor Plain in southwest Western Australia, 440 km east of Kalgoorlie, the project will produce and export green hydrogen and ammonia. The facility is expected to cover approximately 22 690 km^2 of land and be visible from space when complete.

Project partner and green fuels energy developer InterContinental Energy has recently announced the introduction of a "revolutionary cost-cutting nodal hydrogen production system" that will be applied at WGEH. According to InterContinental, its Perth-engineered patented P2(H2) Node™ hydrogen production system, will replace bespoke hydrogen projects with a standardised architecture, and allow for expansion of giga-scale hydrogen production.

The Head of Engineering and Innovation at InterContinental, Richard Colwill said in a statement that the key focus of the node architecture is to minimise the electrical connection between the renewable energy and the hydrogen production.

"Our Patented Power to Hydrogen Node P2(H2)NodeTM is one of our key innovations that powers the delivery of giga-scale green hydrogen projects," InterContinental says on its website. "It serves as a building block that enables scalability to meet the long-term market demand of green hydrogen."

According to the company, "the system lowers production costs by 10-20 per cent, through the standardisation, modularity, reduced electrical infrastructure and storage requirements, which will enable faster large-scale hydrogen adoption for industries such as green iron, fertilisers, power, shipping and aviation fuels."

The P2(H2)Node centres the electrolysis systems within the wind and solar fields, minimising electrical losses while transmitting the vast majority of renewable energy in molecular form, rather than electrical form. "This significantly improves efficiency and permits storage of hydrogen within the pipeline systems," the company states.

"We are physically bringing the two together as close as possible, so that all of the electrical infrastructure of cables, transformers, power systems is minimised to the absolute lowest point possible, and so we take every electron and make it into a hydrogen atom," Colwill said.

InterContinental is involved in several other renewable projects, including the 26 GW Australian Renewable Energy Hub (AREH), located in the Pilbara region of Western Australia, and 25 GW Green Energy Oman (GEO), in the Middle East.

Gas

EU plans complete phase-out of Russian gas and energy imports by end-2027

With US President Donald Trump looking for a way to extricate himself from his promise to end the war in Ukraine, the EU is doing what it can to strengthen resolve against Moscow and take measures to put an end to Russian gas and energy imports to Europe by the end of 2027.

Gary Lakes

International media have reported that the European Commission is discussing a plan designed to bring an end to Russian gas and energy imports to European Union member states by the end of 2027.

Despite efforts to seriously reduce the volume of Russian gas that arrives in the EU since 2022, Russia still supplies about 19 per cent of gas imports, the revenues from which go towards Moscow's efforts to finance its invasion of Ukraine, now in its third year.

Prior to the Ukraine war, Russia supplied the EU with 45 per cent of its gas demand.

The course the EC is expected to take by mid-June is a quota programme, which would serve as the mechanism to enable Brussels to enforce a ban on Russian gas imports by giving companies a legal leg on which to terminate long-term purchase agreements. Talks on the issue of how to halt Russian imports are underway and expected to conclude in a few weeks.

According to reports, the proposal would need majority support from national governments and a majority backing from the European Parliament to take effect. The proposed quota under the revamped REPowerEU Roadmap would be mandatory for all EU member states and are intended to work in a gradual and coordinated manner.

The actions currently under consideration by the EC would be part of an updated REPowerEU Roadmap, which outlines nine specific actions that would reduce and ultimately end the EU's dependence on Russian, gas, oil, and nuclear fuel.

New legislation is anticipated that would require member states to adopt specific measures that would plan and monitor the organisation-wide phase-out of Russian gas.

The steps taken by the member states are to include clear timelines as well as milestones. They would also identify diversification options and the technical capabilities of each state to replace Russian gas. Further legislation would confirm the implementation of the actions.

The roadmap is viewed as the EU's most comprehensive effort so far to halt imports of Russian energy to the EU. Europe's continuing reliance on Russian energy has been criticized as compromising the organisation's sovereignty, and as contradicting three years of Europe's attempts to halt Russia's actions in Ukraine.

"No more shall Euros go into [Russia's] war chest," the *Kyiv Independent* quoted EC Energy Commissioner Dan Jorgensen as saying. "Your gas will be banned. Your shadow fleet will be stopped," he said to Moscow.

"Energy that comes to our continent should not pay for a war of aggression against Ukraine," EU Commission President Ursula Von der Leyen said on May 6. "We owe this to our citizens, to our companies, and to our brave Ukrainian friends," she said.

Kaja Kallas, the EC Foreign Affairs and Security Policy Commissioner posted on X: "Europe has already drastically reduced its reliance on Russian energy. Today, [May 6] we unveiled our plan to end all Russian energy imports by 2027. This will mark a permanent break. Russia will no longer be able to use energy as a weapon against us."

Some of the key measures expected to come from the new roadmap include: EU countries will be prohibited from signing new contracts for Russian gas by the end of 2025; long-term contracts for Russian gas will no longer be serviced beyond 2027; the EU will enhance the monitoring and transparency to track Russian gas imports more effectively; the organisation will continue to diversify energy supplies and boost renewable energy to replace Russian imports; new supply contracts for uranium and enriched uranium from Russia will be limited; the EU will apply tighter measures and surveillance on oil tankers operating as part of Russia's 'shadow fleet', which is used to bypass sanctions.

These new measures will apply to EU-members Hungary and Slovakia, some of whose actions are seen as friendly to the Kremlin. They will be required to submit individual phase-out plans by the end of this year and end any long-term contracts early due to the Commission deeming that the Russian invasion of Ukraine creates *force majeure* conditions. This will allow European companies to stop contracts early without consequence.

Russia's nuclear exports will be included in roadmap targets. Those member states that continue to rely upon Russian-designed VVER reactors will be made to find alternative nuclear fuel sources. The EC will block new contracts involving Russian enriched uranium and it will increase EU production of medical radioisotopes under a new 'European Radioisotopes Valley Initiative'.

The EU's latest move to interrupt Russian gas exports came in mid-May when Brussels approved its 17th sanctions package that includes three newbuild LNG carriers managed by Japan's Mitsui OSK Lines Ltd (MOL) and which are under charter with Russian energy projects.

The three LNG carriers entered service a few months ago by carrying cargo from Novatek's Yamal LNG project. A fourth LNG tanker, which has yet to transport Russian LNG, will likely be sanctioned as well if it loads Russian cargo. That vessel is currently underway from a South Korea shipyard to the Russian arctic.

Snapshot of wind power development to 2030

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Lisbon. Portugal

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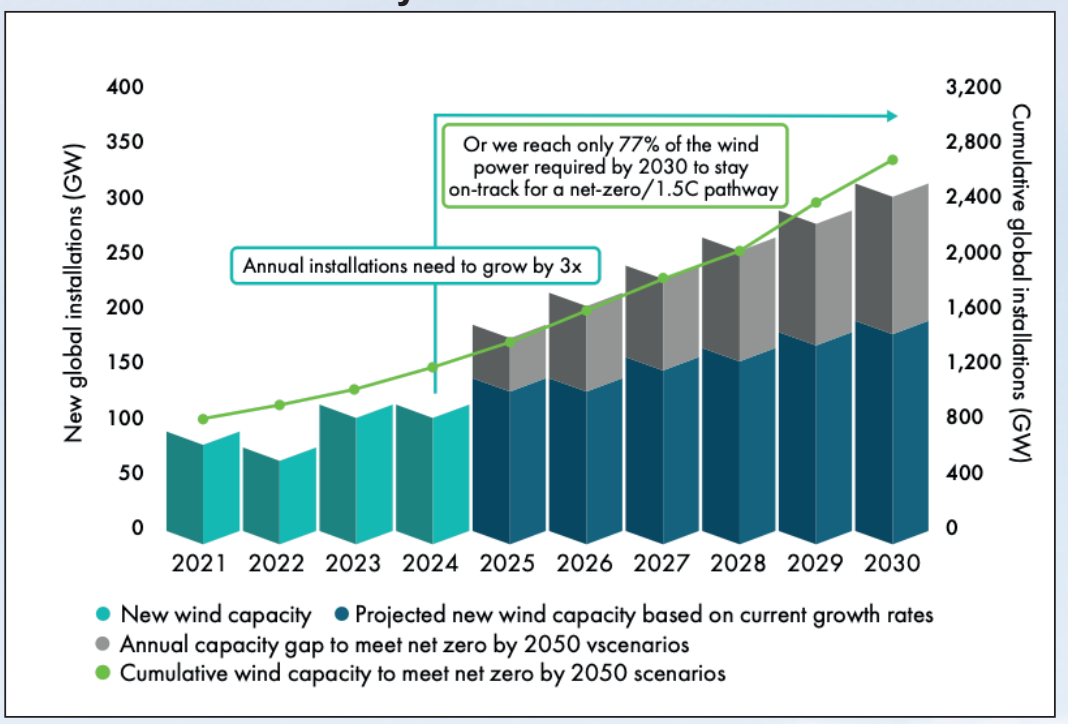
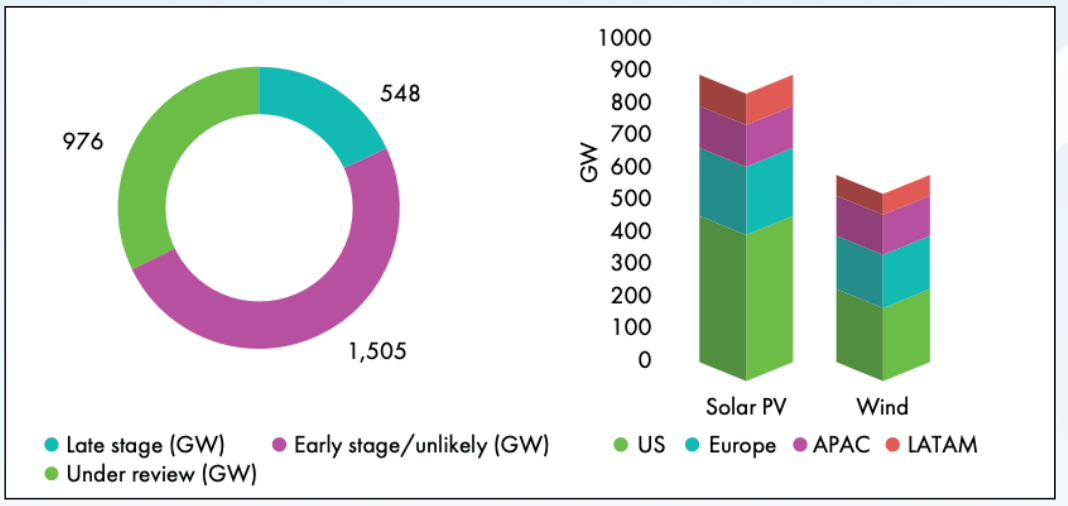
Wind power installations need to triple by 2030 in order to achieve a 1.5°C Pathway



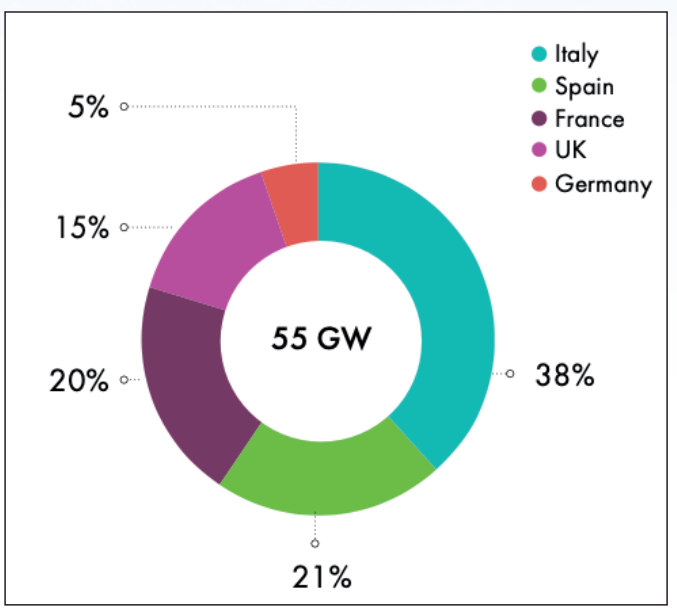
GWEC Global Wind Report 2025, page 20

Renewable energy capacity in connection queues



GWEC Global Wind Report 2025, page 25

Renewable energy capacity in connection queues



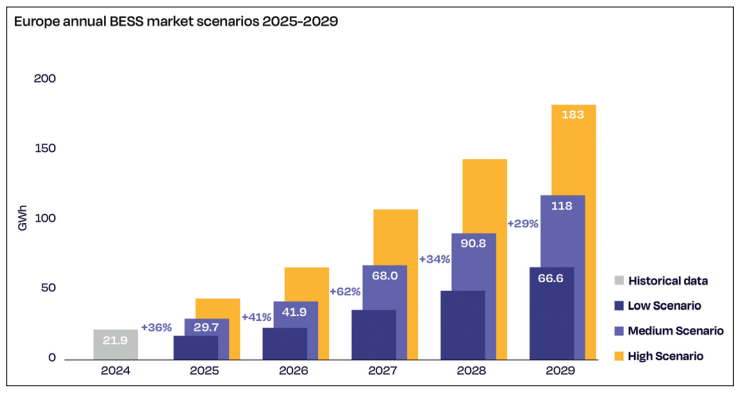
GWEC Global Wind Report 2025, page 25

Source: *Global Wind Energy Council, Global Wind Report 2025*

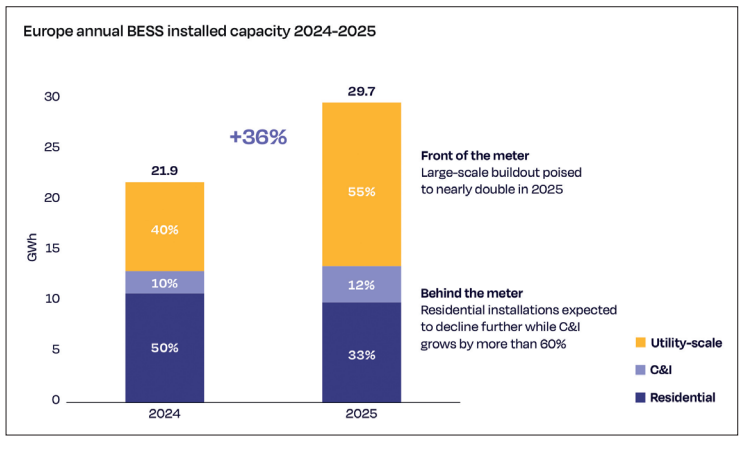
Unlocking the EU's battery storage potential

SolarPower Europe has published its latest European outlook for battery storage. While last year witnessed a record in terms of annual installations, there was also a substantial slowdown in market growth, which remains far below the levels required to meet flexibility needs in a renewable-driven energy system. **Junior Isles** report.

European battery growth is to intensify, reaching almost 120 GWh by 2029 – five times larger than in 2024



The European annual battery market expansion is set to speed up again in 2025, driven by utility-scale systems



The battery energy storage revolution continued to unfold across Europe in 2024, setting yet another annual installation record, according to a report published by SolarPowerEurope last month. But despite this ongoing positive trend, there was also a substantial slowdown in market growth; and while SolarPowerEurope anticipates demand to regain momentum in 2025, it says much will depend on policymakers implementing the right tools to "unlock the immense potential of this strategically critical technology".

Published last month, the 'European Market Outlook for Battery Storage 2025-2029' foresees significant battery energy storage system (BESS) expansion in Europe – a six-fold increase to nearly 120 GWh by 2029, driving total capacity to 400 GWh – yet falls short of energy transition needs.

A 15 per cent annual growth to 22 GWh of newly deployed BESS in 2024 expanded Europe's battery fleet to 61 GWh. That means that one-third of Europe's total installed batteries have been deployed in a single year. Yet, this growth curve has notably flattened compared to the 84–145 15 per cent growth rates of the preceding three years.

The report said this market development was "unsurprising". Residential solar and storage formed the backbone of BESS expansion during the energy crisis, and as retail energy prices declined and crisis-response incentive programmes waned, so did home solar and storage installation.

Introducing the report via webinar, Antonio Arruebo, Market Analyst, SolarPower Europe, noted: "Up until 2024, we had tremendous growth, which really accelerated and kick-started the revolution during the energy crisis. The market was nearly tripling on an annual basis for three consecutive years, with solar and storage being the optimal combination to isolate households from skyrocketing retail electricity prices during the energy crisis… but last year we had a shift in dynamics due to retail electricity prices, which came down significantly from the highs of the energy crisis. This has had a tremendous impact on residential installations and the final deployment we had last year."

Fortunately, strong growth in utility-scale BESS, now accounting for 40 15 per cent of the market, has offset the residential downturn, marking a pivotal moment for battery storage applications. SolarPower Europe says it expects utility-scale storage to take the lead this year – a trend it anticipates will continue.

"The utility segment is compensating for the decline in residential, pushing the market deployment almost to 22 GWh installed last year. This was exactly in line with our medium scenario, which is essentially under current market and policy conditions," said Arruebo. "Large scale batteries are epected to become the trailblazer in the European market in 2025, already with 55 per cent of the installations."

Europe's market, however, remains highly concentrated, with Germany, Italy, and the UK accounting for more than two-thirds of 2024 demand, and the top five markets hosting nearly 80 15 per cent of installed capacity. This must change, says SolarPower Europe.

"More European countries need to embrace the advantages of battery storage and even the leading markets must remove barriers that the sector is facing. Otherwise, the technology will remain far from tapping its potential, and slow down growth of renewables, as their value for investors decreases with wholesale power price increasingly turning negative and the general trend for curtailment of flexible renewables pointing upward," said the report.

Susannah Wood, Vice President of Sustainability and Public Affairs, Statkraft, commented on the opportunities she sees in the energy storage market during the next five years. She said: "We are really interested in the opportunities we see in the utility scale. I see it as more of an imperative than an opportunity – it really is critical that we're employing a lot more storage than we have been to date. The numbers, in a way are quite shocking. Looking at our European pipeline – excluding the Nordics which is a separate case – we have healthy solar, wind and storage pipelines. But compared to our other pipelines, in terms of geographic spread, storage is still very limited – spread across five countries, and one of those countries is the UK. So from an EU perspective, there is so much more opportunity for us to be deploying storage at scale across many more member states."

While SolarPower Europe's five-year outlook foresees a six-fold increase in BESS expansion in Europe, it remains far below the levels required to meet flexibility needs in a renewable-driven energy system. According to SolarPower Europe's Mission Solar 2040 study, EU-27 BESS capacity must reach 780 GWh by 2030 (up from 334 GWh in 2029) to fully support the transition.

To reach these levels of deployment the report outlines five key policy recommendations.

First, the European Commission must adopt an Energy Storage Action Plan within a broader Flexibility Package, to harmonise markets, remove regulatory barriers, and ensure storage is integral to national energy strategies.

"According to our analysis, by 2030 flexibility needs to grow by at least five times. We have identified that storage can provide 27 per cent of the flexibility needs by 2030, and 39 per cent by 2040," noted Catarina Augusto, Senior Advisor, Grids and Flexibility, SolarPower Europe. "But there are a lot of barriers to tackle and implementation to move forward in the different member states. So that's why we call for a new Energy Storage Action Plan that drives all the implementation needed for the energy transition."

SolarPower Europe's second recommendation is that grid connection procedures and pricing frameworks must be reformed to facilitate access, prioritise hybrid systems, and fairly allocate costs.

Thirdly, BESS must have full and fair access to electricity markets, with clear revenue streams, updated Guarantees of Origin frameworks, and permission to stack revenues.

Fourth, balancing markets must become fully competitive and accessible to storage, through harmonised technical standards and transparent procurement.

And fifth, Europe must enhance smart metering and data communication standards to enable real-time energy management and seamless BESS integration.

Commenting on the EU's position in terms of how legislation can shape the future for battery storage, Ignacio Asenjo, Policy Officer at DG ENER European Commission, said: "Storage is at the centre of many of the initiatives that we have… there is a continuation with the non-fossil fuel flexibility assessment process where we are developing, at the EU level, a methodology that will be adopted in the summer. Member states will be using that methodology to assess the needs that they have for non-fossil fuel flexibility, which mostly includes electricity and energy storage at large as well as demand response."

Recently, SolarPower Europe also launched its Battery Storage Europe Platform, bringing BESS' critical role in EU energy security and competitiveness to the forefront of the EU agenda. Through this Platform, the organisation is uniting industry and policymakers to improve the business case and regulatory environment for battery storage across Europe.

"The Platform is working to accelerate the implementation of existing legislation and complement it with a dedicated Energy Storage Action Plan and Flexibility Package to unleash the full potential of the battery storage revolution and ensure its essential contribution to Europe's clean and electrified energy future," said the report.

Meanwhile, the industry continues to innovate in removing the financial and operational hurdles to battery storage adoption. A notable development came last month with ABB announcing the launch of its new BESS-as-a-Service. ABB has called it the first in a range of next generation service models being developed to remove the barriers to clean technology adoption and accelerate industries' transition to net zero.

Requiring no upfront capital investment, BESS-as-a-Service enables companies spanning a wide range of industries – from data centres to transport and logistics to commercial buildings – to benefit from advanced energy storage through a quarterly service fee.

The offer includes all hardware, software and lifecycle support, with ABB managing deployment, maintenance and optimisation so businesses can focus on their core operations while improving energy efficiency, resilience and long-term sustainability. Designed to be technology-agnostic, BESS-as-a-Service works with any type of battery technology, giving customers the flexibility to take advantage of the latest innovations without being tied to a single system.

Innovative business solutions like this will go a significant way to accelerating the adoption of BESS and supporting the EU in achieving its green energy targets. Much will also depend on policymakers. But as the report concluded: "One thing is certain, battery energy storage systems – from residential to commercial & industrial to utility-scale – are the absolute short-cut to delivering the flexible, electrified energy system that is foundational to EU energy security and competitiveness goals."

CATL raises billions, supports bull case for clean tech

The recent public listing of a leading clean energy storage technology company offers several key insights. It sheds light on the company's strategic business plans and transition strategy, as well as the medium-term outlook for the energy storage sector. The listing also highlights strong investor interest in businesses aligned with the energy transition. **Joseph Jacobelli** explains.

On May 20, the world's largest battery producer, Contemporary Amperex Technology Co. Ltd, widely known as CATL, successfully secured a secondary listing on the Hong Kong Stock Exchange. It was first listed in June 2018 on the Shenzhen Stock Exchange, where shares are not freely tradable by all investors, including foreign investors.

CATL was founded in 2011 and is headquartered in Ningde, Fujian. It is the world's leading developer and manufacturer of lithium-ion batteries, primarily serving the electric vehicle (EV) and energy storage systems (ESS) sectors. The company quickly rose to prominence thanks to strong technological capabilities, a vertically integrated supply chain, and early partnerships with global automakers. Over the past decade, CATL has demonstrated remarkable growth. It has been the world's largest EV battery maker for eight consecutive years (2017-2024), holding a share of almost 38 per cent of the global market in 2024. In the ESS market, it has led for four straight years, with a similar global share that year.

Its client roster is unmatched. In the automotive sector, it includes global manufacturers such as BMW, Ford, Honda, Mercedes-Benz, Stellantis, Toyota, and Volkswagen, as well as domestic makers like Geely, NIO, SAIC and Xiaomi. In the ESS segment, clients include the US's NextEra Energy and Synergy, as well as Finland's Wärtsilä. CATL's global footprint spans 13 manufacturing bases and six research and development centres, with significant international expansion in Europe, Southeast Asia, and beyond. It is also a leader in battery innovation, pioneering products like the Qilin battery – which supports fast charging from 10 per cent to 80 per cent in approximately 10 minutes under optimal conditions – and the Shenxing battery, an ultra-fast-charging lithium iron phosphate model capable of adding up to 520 km of range in five minutes.

As the biggest player in the battery storage space, it is important to understand the company's strategic business plans and transition strategy.

In terms of business development, CATL has adopted a multi-layered approach. Firstly, it is keen to expand globally. It already has two overseas manufacturing bases – Germany's Thuringia factory and Hungary's Debrecen factory. In Hungary, it plans to invest HK$27.6 billion ($3.5 billion), amounting to around 90 per cent of its Hong Kong initial public offering proceeds. It is also at an advanced stage of setting up a joint-venture factory in Zaragoza, Spain, with Stellantis, and is progressing with battery value chain projects in Indonesia. In Spain, CATL's €4.1 billion ($4.6 billion) venture aims to build a 50 GWh lithium-iron phosphate battery plant by 2026. These European ventures will bring the company closer to the manufacturing facilities of key customers.

As previously noted in *The Energy Industry Times* ("VPPs, AI, and EVs: a boost to the EU energy transition", June 2024), battery storage is seeing rapid innovation. CATL has embraced this trend and is diversifying its battery technology portfolio. For example, it aims to mass-produce sodium-ion (Naxtra) batteries by late 2025. These offer cost efficiency and competitive energy density (175 Wh/kg). It is also developing a battery-swap eco-system in China, aiming to cover about 80 per cent of key logistics routes nationwide by 2030.

In terms of energy transition planning and sustainability, CATL is targeting carbon neutrality in its core operations by 2025 and across its entire value chain by 2035 – well ahead of China's national 2060 target. The company is transitioning all its factories to renewable energy sources and already has four facilities certified carbon neutral under PAS2060 standards (a globally accepted specification developed by the British Standards Institution), including one hydropower-powered site in Chengdu. It is implementing supplier sustainability audits and promoting blockchain-based raw material tracing and battery passports to enhance lifecycle transparency. Innovations such as high-density condensed batteries and advanced recycling systems aim to reduce reliance on fossil fuels in ESS. The company is also collaborating with industries such as steel and cement to develop zero-carbon industrial parks and islands, aligning with China's dual carbon goals.

CATL is a dominant player in the booming energy storage sector, driven by the global shift towards decarbonisation and the increasing adoption of electrification. Policy incentives, the rising energy demands of data centres, and the expansion of renewable energy sources are all contributing to sustained demand for batteries, particularly ESS.

These trends are creating strong tailwinds for the battery market, as industries and governments seek to reduce carbon emissions and transition to more sustainable energy solutions. Market projections reflect this rapid expansion. According to data in CATL's prospectus, EV battery capacity is expected to grow from 969 GWh in 2024 to 3754 GWh by 2030, representing a compound annual growth rate (CAGR) of 25.3 per cent. ESS battery capacity is forecast to rise from 10 GWh to 300 GWh in the same period, a surprising CAGR of 76.3 per cent.

Battery recycling and emerging applications – in sectors such as aviation, maritime, and industrial machinery – are also projected to become major long-term demand drivers.

CATL issued shares at HK$263 ($33.58) per share. By the end of the first trading day, the stock had climbed to HK$311.40 – a 16 per cent gain – despite weak and volatile global markets. According to *Reuters*, "the institutional tranche of the deal was oversubscribed 15.2 times, according to CATL's filings, while the retail portion was 151 times oversubscribed". CATL's offering is likely the largest by a clean energy or clean tech company in the past five years.

Its strong performance signals that global investors remain keen on companies tied to the energy transition, even as enthusiasm wanes in the US capital markets. Investor interest remains robust in regions such as Asia and Europe. The offering can be seen as an endorsement of the prospects for at least some segments of the energy transition space.

In recent months, the fourth quarter of 2024 to first quarter of 2025, there has been compelling evidence of healthy global investor and capital markets interest in the energy transition. Despite some quarterly fluctuations and notable project cancellations influenced by policy uncertainty, especially in the US, the underlying momentum remains strong as there has been significant year-over-year growth in overall clean energy investment globally as well as a substantial rebound in mergers and acquisition activity.

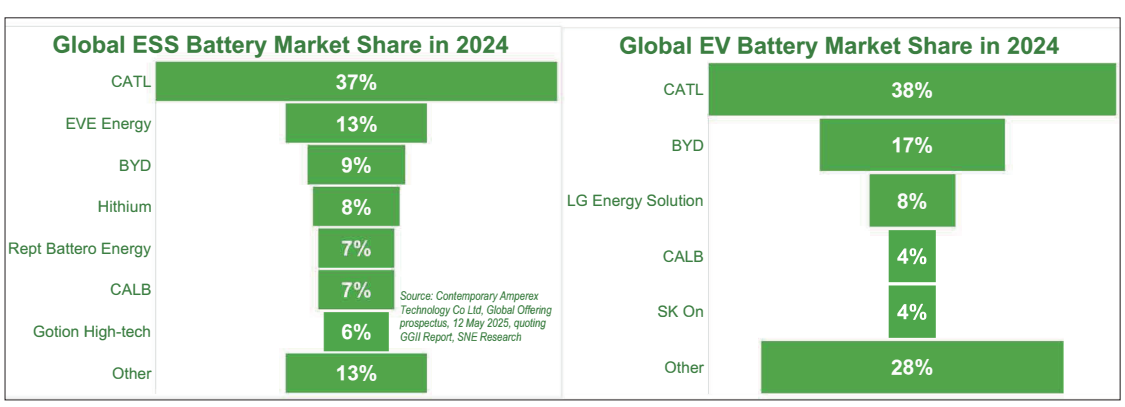
Among the many examples is the increase in Asia investment in the UK's offshore wind sector in May. Chinese firms Goldwind and Mingyang Smart Energy, alongside Japanese companies such as Mitsubishi Heavy Industries, committed billions to projects, including a £1.2 billion ($1.6 billion) floating wind farm off Scotland's east coast and an £800 ($1.1 billion) million fixed-bottom wind farm off England's east coast.

In conclusion, the successful offering by CATL is by no means a harbinger of growth in energy transition-related investments. However, it stands as a key example that, despite negative signals from current US policy towards the energy transition, the market remains on a growth trajectory. It is still offering exponential business and investment opportunities to both direct and capital markets investors alike.

Giuseppe 'Joseph' Jacobelli, head of single-family office Bougie Impact Capital Ltd., has over 30 years in energy markets. He raises climate finance awareness through his 'Asia Climate Finance Podcast' and publications, including his upcoming book, 'Powering the Unstoppable Green Shift'.

Jacobelli: as the biggest player in the battery storage space, it is important to understand CATL's strategic business plans and transition strategy

CATL has been the world's largest EV battery maker for eight consecutive years (2017-2024), holding a share of almost 38 per cent of the global market in 2024. In the ESS market, it has led for four straight years, with a similar global share that year



Re-imagining nuclear: a practical path to a resilient European energy future

Cartridge-based molten salt reactors can help decarbonise industry and unlock clean, reliable power across the continent, says Thorizon's **Kiki Lauwers**.

Europe's energy system is at a crossroads. As the continent phases out fossil fuels, the demand for low-carbon, independent energy is surging. According to the International Energy Agency (IEA), electricity use across the EU is expected to climb steadily in the next few years. On top of this, European industry is struggling to remain competitive.

Right now, nuclear power provides nearly a quarter of Europe's electricity. More importantly, it's the largest source of carbon-free power on the continent. But its role is about to expand dramatically. As we decarbonise industries and power-hungry AI workloads grow, the demand for reliable, dense, clean energy is accelerating. Nuclear is a crucial asset on the pathway to net zero. This is evident in the actions of many European countries that have reversed their nuclear phase-out policies over the past 12 months. It's also reflected in public commitments to nuclear and small modular reactors from major tech companies like Google and Microsoft.

Yet public support for nuclear is still lagging. In the most recent surveys, concerns about cost, safety, and waste persist. Today's nuclear waste, often viewed as a liability, is a vast untapped energy resource, one that could power Europe for decades. To unlock that potential, we need a new kind of nuclear technology. That's where molten salt reactors come in.

Molten salt reactors (MSRs) are part of a class of advanced nuclear systems known as Generation IV reactors. Unlike conventional designs that use solid fuel rods, MSRs use a liquid mixture of molten salt that serves both as a coolant and a fuel carrier. In these systems, heat is produced through nuclear fission within the circulating salt.

MSRs have several safety advantages built into their design. There is no risk of a traditional core meltdown, as the fuel is already in liquid form. They operate at low pressure under all conditions, reducing the risk of pressure-related failures. The reactors also feature strong negative temperature feedback; when the temperature rises, the fuel salt expands, slowing the nuclear reaction.

This high operating temperature and inherent safety make MSRs highly efficient and cost-competitive. Due to their high core temperature, they are well-suited for supplying industrial heat, including to sectors that are difficult to decarbonise with conventional nuclear technology.

MSRs can use a variety of fuels, including low-enriched uranium, thorium, and spent nuclear fuel. Because the fuel is dissolved in liquid salt, MSRs are more flexible in fuel sourcing than traditional solid-fuelled reactors. This opens the door to reducing long-lived nuclear waste, making use of underutilised materials, and even closing the nuclear fuel cycle.

From prototype to practice

Molten salt reactors have long been described as a kind of "holy grail" of nuclear fission, offering the potential for high efficiency, flexible fuel use, and enhanced safety. The technology was successfully demonstrated in the United States during the 1960s, but it was never developed for commercial deployment. Despite ongoing interest, two persistent challenges have limited progress. This has been due to a number of factors:

Material Integrity: Materials in the molten salt reactor core must withstand constant radiation, corrosive salt, and high temperatures. Ensuring long-term durability of materials under these conditions remains one of the key engineering hurdles.

Fuel handling and transport: Molten salt reactors need large amounts of liquid fuel, and figuring out how to safely move, store, and handle that salt, especially once it has been used, has not been easy.

These difficulties have kept MSRs in the research domain for decades. Thorizon's design addresses these challenges by rethinking how the core is structured and how the fuel is managed, aiming to make the technology more practical to build, operate, and license.

Rethinking the core

Rather than stretching materials to endure decades of intense radiation, high temperatures, and corrosive environments, Thorizon has designed around the problem. Instead of one large, fixed reactor core, Thorizon uses a modular system built from individually contained cartridges. Each cartridge is subcritical on its own and houses the key systems needed for reactor operation – the molten salt fuel, a primary heat exchanger, and a pump – all within a fully enclosed structure.

Lauwers: Thorizon One is moving from theory to implementation

The cartridges remain closed before, during, and after operation. No material enters or leaves the cartridge while in the reactor. When a cartridge reaches the end of its service life, typically five years or more, it is removed and replaced. The salt is then conditioned and, if needed, reprocessed at an external facility. This avoids the complexity and proliferation concerns associated with online reprocessing, with salt conditioning instead carried out offsite after cartridge removal.

Each cartridge is designed with two containment layers: a primary vessel and a secondary barrier, separated by a gas-swept gap. This provides an added layer of safety, allowing for real-time monitoring and limiting pressure build-up from fission gases or volatile compounds.

This design is the foundation for Thorizon's first commercial system – Thorizon One.

Thorizon One

The Thorizon One is designed to be cost-competitive and deliver 250 MW of industrial heat, which can be directly used in sectors like the chemical industry or hydrogen production. This heat can also be transformed into 100 MW of electricity – enough to power 250 000 households. The reactor can be configured to provide flexible capacity between 50 MW and 300 MW, storing energy when demand is low and releasing it during peak hours.

During operation, the pump moves the salt upwards through the cartridges. The reactor becomes critical – meaning fission happens – only when all cartridges are active and salt is circulating. Fission occurs through neutron interaction at the top of the reactor. The heat then flows to the bottom and is extracted through the heat exchanger. At the end of the cartridge lifecycle, or in case of a power failure, the pump stops and the salt drops to the bottom of the cartridges. This stops the fission reaction automatically. This way, the reactor stays safe, even during a full power outage scenario.

The Thorizon One has been endorsed as the only molten salt reactor project in the EU Small Modular Reactor (SMR) Industrial Alliance – a significant recognition of its strategic relevance to Europe's energy future.

Journey to commercialisation

Thorizon was awarded a €10 million grant in 2024 as part of a consortium with Orano through the France 2030 programme, making it one of only three molten salt reactor projects selected. Together with Orano, Thorizon is leading ten specialised work packages, ranging from fast spectrum reactor design and cartridge handling to fuel salt transport and nuclear safety, with strong involvement from CEA, NRG, and other top-tier research institutions.

In parallel, Thorizon has teamed up with VDL and Demcon to demonstrate the manufacturability and functionality of key molten salt reactor components. This long-term collaboration will support critical prototyping, including heat exchanger development and salt purification systems.

Most recently, in March this year Thorizon announced a successful fundraising of €20 million to accelerate reactor development. This includes a €16 million equity commitment from existing investors led by Invest-NL, and a €4 million grant from the Province of Noord-Brabant. This new capital will support licensing efforts, design and prototyping, and commercial development. Thorizon is actively seeking strategic industrial collaborators and investors across Europe on its path to building the first of its kind.

With a construction licence application planned for 2027 and construction for the first of a kind targeted for 2030, Thorizon is moving from theory to implementation.

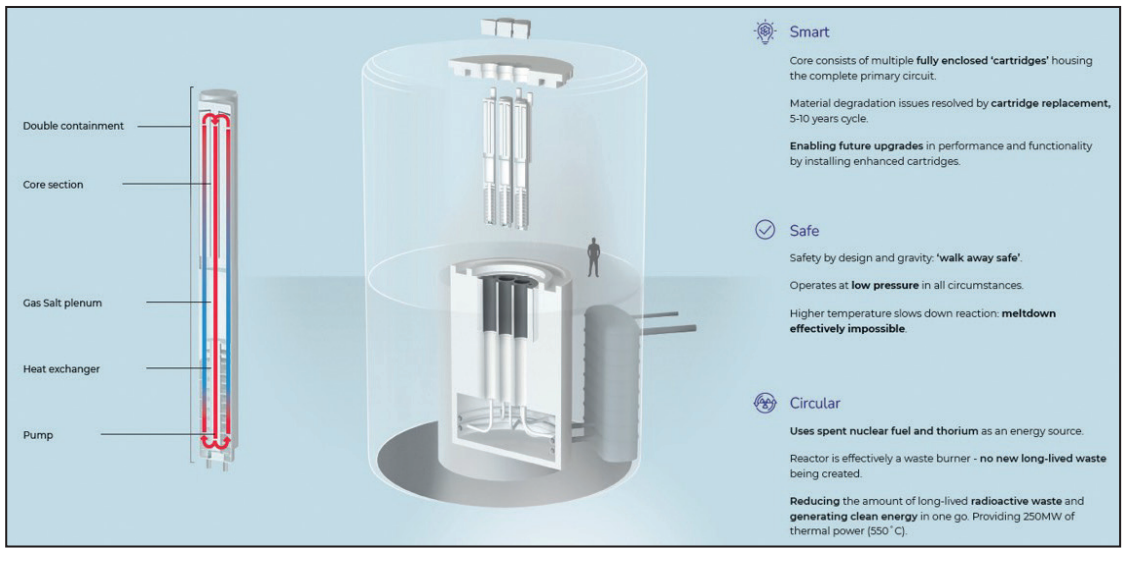
Europe's next nuclear chapter

Europe's energy system is undergoing a rapid transformation, driven by decarbonisation goals, energy security concerns, and growing demand from industry and digital infrastructure. Existing nuclear plants play a critical role in this transition and will continue to provide stable, low-carbon power for decades. But to meet future needs, particularly flexible heat, affordable power, and long-lived waste reduction, new reactor designs are required alongside today's fleet.

Molten salt reactors represent a new generation of nuclear technology that is cost-competitive, inherently safe, and capable of significantly reducing long-lived waste. Thorizon One applies these principles through a cartridge-based design focused on manufacturability, maintainability, and real-world deployment. By delivering high-temperature heat and flexible electricity from a compact, modular system, it offers a practical solution to support Europe's energy transition.

Kiki Lauwers is CEO at Thorizon.

A cutaway view of Thorizon's modular cartridge-based reactor, showcasing its double containment, pump-driven salt circulation, and walk-away safe design



Junior Isles

Mirror, mirror on the wall…

One big, beautiful bill" is how US President Donald Trump describes his bill to cut taxes and boost spending on the military and border enforcement. But where is the beauty in legislation that will also damage the renewable energy sector?

The bill, which narrowly passed in the House of Representatives and essentially guts the green energy support provided under the Biden-era Inflation Reduction Act (IRA), was welcomed by American Petroleum Institute who praised the bill for "preserving competitive tax policies".

Clean energy supporters, however, have not been so welcoming.

"Despite many reassurances that [House] members support domestic manufacturing, a vote for this bill was a vote to close US factories and concede manufacturing jobs of the most important energy resource of the 21st century to China," said Michael Carr, Executive Director of the Solar Energy Manufacturers For America Coalition.

The House bill strengthened restrictions on the use of tax credits for any project backed by Chinese companies or using materials produced in China under a provision targeting "foreign entities of concern". China dominates all aspects of the clean energy supply chain, and the restrictions effectively eliminate the ability of most projects to claim the credits.

"This isn't a scalpel, it's a meat cleaver, and it will hurt us all," said Heather O'Neill, President of clean energy lobby group Advanced Energy United.

Though O'Neill's "all" may have been referring to the US, the nation's direction of travel under the Trump administration is having global consequences. Certainly, the bill, together with Trump's tariff wars, are causing concern far beyond US domestic boundaries. The picture is getting ugly.

At Aurora Energy's recent Spring Forum in London, UK, panellists during a session on securing Europe's energy future discussed how US policies are already affecting the energy transition's supply chains in Europe.

Anne-Laure de Chammard, Executive Board Member & Group Executive Vice President, Siemens Energy, commented: "The tariffs and the geopolitical tensions that go with it, is creating something where the uncertainty is now becoming very structural… most of the investments are halted because of that. Inventories have stopped. There was a drop of more than 20 per cent in ports in the US; it's now back on track but the ripple effects are huge everywhere. So even though you might think there is no short-term effect, the long-term effect – because we have 5-10 year projects – is going to be important, whatever happens."

Andreas Regnell, Senior Vice President, Head of Strategic Development at Vattenfall noted that although the impact of the tariffs is primarily indirect, "it does not mean that it's not severe". He added: "It's super-severe but it's not direct because many of the things we source, we buy from Europe. But the uncertainty means that things take longer and fundamentally, it increases cost of capital."

This was echoed by Tim Meyerjürgens, CEO, TenneT, Germany, who said: "All our suppliers are more or less in Europe but if we look at the entire supply chain, especially in the raw materials market, of course it is also affecting our supply chain. So it brings insecurities, additional costs and I think it's a wake-up call for Europe to become more resilient."

Indeed, supply constraints are increasingly shaping the cost and pace of decarbonisation, as various choke points make long term planning and execution more difficult than ever. The EU is attempting to address the issue through several measures, such as the Critical Raw Materials Act and Clean Industrial Deal.

Meyerjürgens said the Clean Industry Act is therefore "very important" and needs to not only be introduced "very fast" but with "less bureaucracy than we usually do. Otherwise, it will not help sufficiently".

During the panel discussion Elyette Roux, Executive Vice President Power Grid and Member of the Executive Committee at Nexans, agreed but added: "It's surprising to see that President Trump didn't put an import tax on copper, which is the main metal for making cables. But as we do manufacture copper cables in Canada, that's good for the US. So, so far so good. But for sure, the uncertain climate is pushing us to reinvent the way we should look at our supply chains."

Ahead of the panel session, Roux told *TEI Times* how Nexans was tackling the challenges.

Risks and challenges to offshore wind are particularly acute, especially in the US, where Trump has put a halt to projects in federal waters. Fortunately for Nexans, only 4 per cent of the French cable manufacturer's backlog of projects is in the US – all of which are due to be completed by next year. The remaining projects are spread globally, primarily in Europe.

At the distribution level the production of grid components is generally local, since distribution grid operators are usually state-owned.

Roux noted: "This means you operate in a regulated environment in terms of the energy tariff and type of products, etc. With the need to interconnect grids across borders there is an increasing need to harmonise standards and products."

With circularity being a central theme to sustainability, a key challenge for cable manufacturers is procuring copper and aluminium from existing sources.

Roux explained: "Copper or aluminium scrap is not that easy to capture. Everybody wants copper and there is a lot of theft due to its value. And with regards to aluminium, you can only make recycled aluminium cables from [existing] aluminium cables. You cannot, for example use aluminium from a soda can because it has to be pure enough to be used as an aluminium cable.

"So the circular loops that have to be created for aluminium are not that easy because you have to be able to access the dismantling of aluminium cables. In Europe it's quite difficult because it is underground – usually when a grid operator makes a repair, the old cable is left in the ground."

Nexans is therefore organising a circular supply chain to ensure it can access the scrap that is the resource of tomorrow. It collects all the scrap from its plants and reinjects it to its aluminium suppliers, providing up to 10 per cent of scrap towards the manufacture of aluminium.

Meanwhile, next year the company plans to open its own copper smelting and refining plant that will have the same production capacity as a copper mine in Peru but produced from copper scrap.

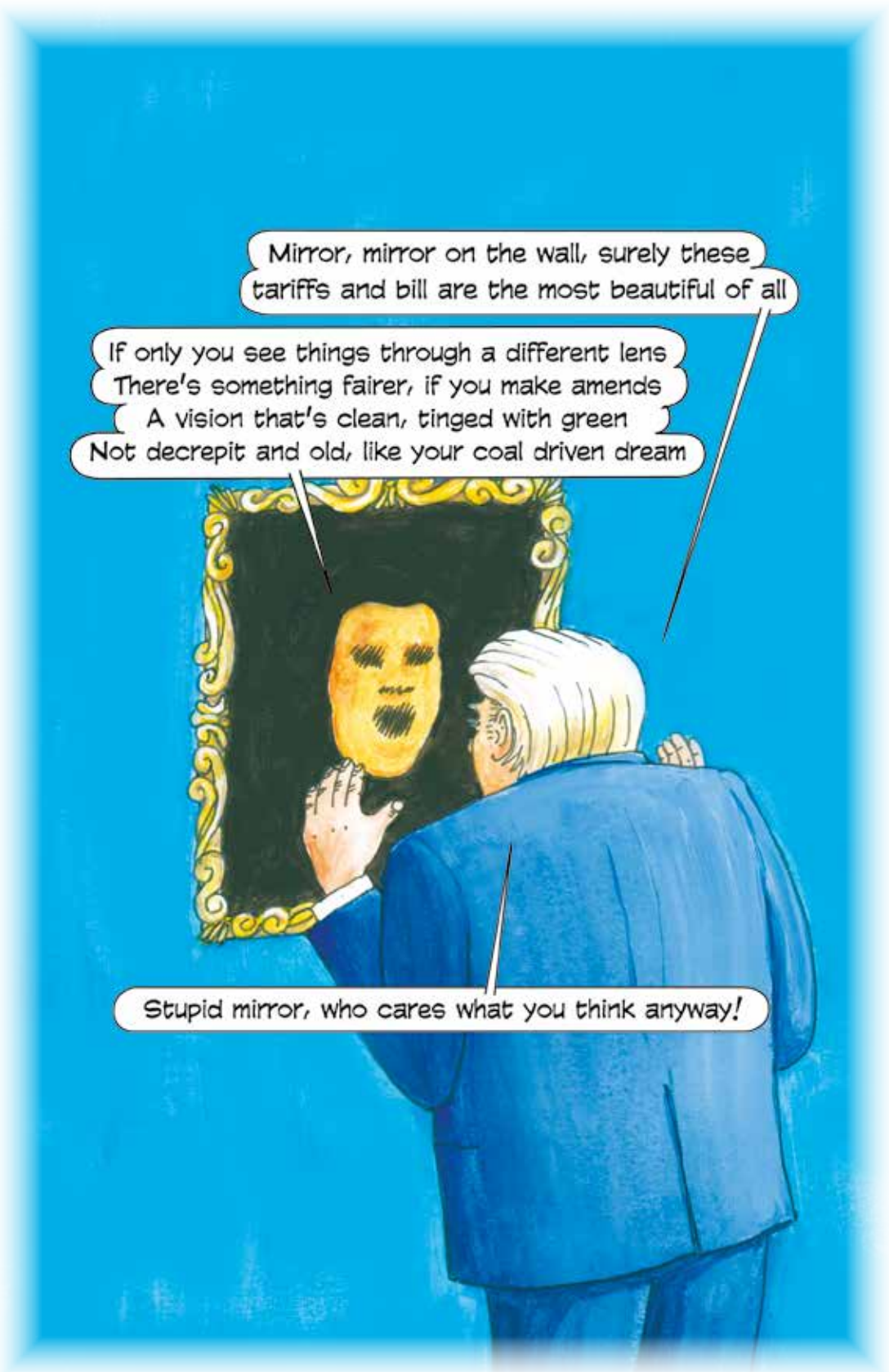
"There will be scarcity of copper by 2030 so that's why we are accelerating," said Roux. "… In Europe, we have decided not to use any more Russian aluminium, so we don't have access to that."

Being more self-sufficient or at least diversifying supply chains seems an obvious thing to do but how countries do this is key, especially if the energy transition is to maintain its momentum globally.

The US government's approach may well help it to become more self-sufficient but will do little to help the world's transition to a clean environment – although that is probably far from the mind of President Trump.

Yet overlooking the benefits that clean energy has brought to the environment and its own economy could be viewed as shortsighted and have a ripple of unforeseen circumstances.

Trump may see his new tax bill as beautiful but perhaps should look through a different lens when asking his mirror if his policy is indeed the fairest of them all.



Cartoon by Jem Soar