ESR NEWSLETTER
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ESR engineers for social responsibility

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1. Don't blame renewables

From an article in Reuters Power Up by Ron Bousso, Energy Columnist, 1 May 2025.

While it may be tempting to blame the power outage that hit the Iberian peninsula on the rapid growth of wind and solar power in Spain, reliance on renewables is not to blame. Rather, the issue appears to be the management of renewables in the modern grid. The. massive blackout– the biggest in Europe's history – should be a stark warning to governments: investments in power storage and grid upgrades must go hand in hand with the expansion of renewables generation.

At around 12:30 p.m. (1030 GMT), electricity generation in Spain dropped rapidly from around 27 gigawatts to just over 12 GW. The 15 GW loss was equivalent to 10% of Spain's total installed capacity. The sudden drop in grid load destabilized electricity flows, which require an extremely stable frequency of 50 Hertz to maintain supply. This, in turn caused a break in the Spanish and French electricity interconnection that goes through the Pyrenees mountains, resulting in the total collapse of the Spanish power system. Spain exports electricity to Portugal, so the collapse of power in Spain quickly spread throughout the Iberian Peninsula. Some areas in France also suffered brief outages on Monday.

The cause of the initial drop that led to the catastrophic cascade of events is unclear, though a collapse in Spain's solar power system was certainly involved. Data from Spanish grid operator Red Electrica shows that on Monday solar generation dropped at 12:30 p.m. from around 18 GW to just under 5 GW by 1.35 p.m., so this accounted for the vast majority of the overall drop. But it remains unknown why this occurred or why it caused the entire system to collapse so rapidly.

One possible contributor is the lack of so-called 'grid inertia' as a result of the relatively small share of nuclear and fossil fuel generation in Spain's power mix. Inertia is the kinetic energy created by the rotation of spinning generators. In the case of a sudden loss of power, this provides a temporary supply of energy that can help maintain grid frequency, thus acting as a shock absorber. Inverter-based wind and solar power, which generated just under 70% of Spain's total electricity at the critical moment on Monday, does not involve physical rotation and therefore inertia could not compensate for the sudden loss of power.

An obvious short-term solution to avoid a repeat of the blackout would be to maintain a higher baseload of rotating power generation. Over the long term, however, power systems will need to invest heavily in battery capacity to store electricity as well as technologies for synchronising the grid that are critical to maintaining the 50 Hz frequency.

In theory, this should be doable, as battery costs have declined sharply in recent years and are being deployed at scale around the world. But all this would still require heavy investments. While spending on new solar capacity reached around $500 billion last year, investment in grids was only at around $400 billion, becoming bottlenecks for the energy transition, according to the International Energy Agency.

2. Climate projects can bring big economic benefits

Extracts from a story by Craig Saueurs from Euro News

As floods, fires and heatwaves grow more frequent and destructive, new research shows that climate adaptation isn't just urgent. It's also one of the smartest investments governments can make. According to a new report from the World Resources Institute (WRI), every €1 spent on climate adaptation will yield roughly €10 in benefits over a decade.

Glaciers are disappearing from the Alps, and record heatwaves and flash floods are costing lives and destroying livelihoods. Scientists warn that even if warming reverses, much of the damage, such as Arctic melting, won't be undone in our lifetimes. As climate change intensifies, the need to protect lives, economies and ecosystems is no longer a distant concern. But this research suggests that adaptation is not only a necessity – it pays off.

"One of our most striking findings is that adaptation projects aren't just paying off when disasters happen – they generate value every day through more jobs, better health and stronger local economies," said Carter Brandon, senior fellow at WRI.

"That's a major mind shift: policymakers don't need a disaster to justify resilience – it's simply smart development."

Breda in the Netherlands recently became the EU's first National Park City in recognition of its work to restore wetlands, green its streets and adopt a whole-of-society approach to embracing eco-minded urban development. Twenty-two cities in Europe, including Copenhagen, Milan and Stockholm, earned an A grade from the non-profit CDP in 2023 for their climate leadership.

As global leaders prepare for COP30, the WRI and others argue that climate adaptation should no longer be treated as a side project but rather as a central part of policy. "This evidence gives leaders and non-state actors exactly what they need heading into COP30: a clear economic

case for scaling adaptation," said Dan Ioschpe, a high-level champion for COP30, the global climate conference taking place in Belém, Portugal, in November.

3. Tide is turning in Europe and beyond in favour of nuclear power

*From an article by **Jillian Ambrose**, Guardian website, 1 June 2025*

Despite long-held environmental concerns about nuclear power generation, political leaders across the globe are increasingly looking to lift restrictions on nuclear reactors or invest billions in new projects to keep pace with the fast-rising demand for low-carbon energy, which is expected to accelerate as AI datacentres grow.

Europe's largest power blackout in decades, still largely unexplained, has raised questions about whether renewable energy can be relied on to provide a stable source of clean energy. It has also fuelled a renewed interest in the global nuclear power renaissance already under way. Even before the Iberian peninsula was plunged into chaos, critics of the government's anti-nuclear stance had raised their concerns. A few weeks before the blackout, the chair of the renewable energy company Iberdrola, which owns a small stake in the country's nuclear fleet, warned Spain against plans to shut all seven of its nuclear power plants by 2035. Days later Sama Bilbao y León, director-general of the World Nuclear Association, told a conference in Madrid that she was "concerned about Spain's economic future without nuclear energy" because its economic progress would rely on "abundant, clean, and affordable energy, available every day, all year round".

In Germany the hardline stance against nuclear power is already softening. Chancellor Friedrich Merz, who came to power in February, has criticised the previous government for shutting Germany's last three nuclear power stations in the midst of Europe's energy cost crisis and promised to explore whether it is possible to resurrect the plants. Merz is not expected to back a return to new conventional nuclear power projects in Germany but he has vowed to invest in new technologies: such as small modular reactors (SMRs) and nuclear fusion.

The Swiss government has also said it will lift the country's ban on the construction of new nuclear power projects, which has been in place since 1 January 2018, to pursue SMR projects.

The tide against nuclear power is turning in countries beyond Europe too. Later this summer Taiwan is expected to vote on whether to restart a nuclear reactor which shut just last week amid concerns on the island about the rising electricity demand of some of the world's biggest chipmakers which are based there, and about energy security in the event of a military blockade by China.

The concerns about a looming surge in power demand driven by tech giants and the desire for secure, homegrown low-carbon energy sources are common in countries across the globe. This trend is key to the renewed interest in nuclear power.

In the US, the notorious Three Mile Island site in Pennsylvania will restart for the first time in five years after its owners struck a 20-year deal to power Microsoft's energy-hungry AI datacentres. Tech companies including Amazon, Meta and Apple are all expected to consume vast amounts

of energy to power the boom in AI, and nuclear has emerged as an increasingly popular option given its steady stream of 24/7 power generation.

The growing demand for electricity may have piqued the interest of global government in nuclear power, but it is the breakthrough in new nuclear technologies which promises a new dawn for the industry. Whereas full-scale nuclear projects are notorious for spiralling budgets and delays, SMRs promise quicker, cheaper construction because the component parts can be built in a factory and assembled on site. But the technology has not been proven commercially.

Last year Google became the first company to ink an agreement to purchase nuclear energy from small modular reactors (SMRs), which are being developed by Kairos Power in the US. Small modular reactors are also being pursued by the US, South Korea, China, Russia, and Canada. The latter approved the construction of the first mini-nuclear reactor in the West earlier this month which is expected to begin operating by 2029.

In the UK, Keir Starmer unveiled plans for a historic expansion in nuclear power across England and Wales shortly after calling for tech companies to work alongside the government to build small modular reactors (SMRs) to power energy intensive AI datacentres across Britain. He said that he anticipated smaller reactors could begin operating in 2032 and become commonplace across Britain.

The nuclear industry's detractors have played down the potential for SMRs to prove a gamechanger for nuclear energy. Dr Doug Parr, the chief scientist and a director at Greenpeace UK, said the Labour government had "swallowed nuclear industry spin whole, which is courageous – or stupid – given that not a single one has been built, and with the nuclear industry's record of being over time and over budget unmatched by any other sector." He added: "As for the unsolved problem of nuclear waste management, government don't see the need to mention it at all.

4. AI can help us protect the planet

"AI is particularly good at detecting patterns among very large amounts of data that no team of humans could process," said Dr Alina Patelli, at Aston University in Birmingham. "It learns to identify correlations that are sometimes subtle, even counterintuitive, and can easily escape even the trained eye of highly qualified human experts."

Leveraging vast amounts of weather data is a good example, she said: "Running AI to correlate predicted droughts with the water demands of industrial farming will yield insights into the likely fluctuations in global food supply over the coming decades, giving scientists a head start in coming up with solutions."

AI has already delivered weather forecast tools that are faster and cheaper than current supercomputer models – some can even run on a laptop. "That's a huge development, because it has implications for disaster risk management, agriculture and energy infrastructure," said Dr Mohammad Hossein Amirhosseini, at the University of East London. In other words, it can improve life-saving extreme weather warnings, help maximise crop yields and make electricity grids more efficient and resilient.

Running a grid is a delicate balancing act of matching supply to demand, and AI can anticipate and optimise changes, which is particularly useful as inherently variable renewable energy ramps up.

Dr Andrew Rogoyski, at the University of Surrey, said: “We don’t want to bet our future on the promise of future technologies, but AI does seem to offer the possibility of making big advances in key sciences and technologies that will help mitigate [against] the impact of climate change.” “For example, there have been recent advances in nuclear fusion, where AI is being used to better control complex instabilities in the fusion plasmas, bringing the promise of very low-cost energy that bit closer,” he said.

There are lots of other examples: Wildbook uses computer vision to identify individual animals from jaguars to dolphins by their unique markings and is revolutionising wildlife tracking and anti-poaching efforts, said Amirhosseini, with other tech even predicting the likely location of poachers.

Concerns over the rapid rise in the energy needs of data centres due to AI are valid, said Amirhosseini. “But we need to look at the broader picture. If AI is used to [cut carbon emissions], then the net environmental benefit can far outweigh the energy cost of training the models.” Furthermore, the increased demand from electric vehicles, air conditioning, heat pumps, and industry will far surpass that from data centres. And work on making the training of AI models more efficient may make the energy concern “a temporary blip”, said Rogoyski.

There is also the serious issue of biases in AI models. “They are as biased as the data used to train the underpinning software,” said Patelli. Rich western countries tend to have far more data than poorer, developing countries, meaning people in the latter could be ill-served if AI tools are used without careful thought.

This points to a deeper cultural issue, said Amirhosseini, which is “the risk of overrelying on automated systems and sidelining local knowledge and lived experience. We need to treat AI as a partner, not a substitute, for human judgment, community engagement, and scientific integrity.”

5. Electric scooters and a salt battery push in China

From an article by Xiaoying You. BBC website 2 June 2025

Dozens of glitzy electric mopeds are lined up outside a shopping mall in the city of Hangzhou in eastern China, drawing passersby to test them. But these Vespa-like scooters, which sell for between £300 and £500 (US$400 and $660), are not powered by the mainstream lead-acid or lithium-ion cells, commonly used in electric two-wheelers. Instead, their batteries are made from sodium, an abundant element that can be extracted from sea salt.

Next to the scooters stand a few fast-charging pillars, which can replenish the vehicles' power level from 0% to 80% in 15 minutes, according to Yadea, the major Chinese two-wheeler manufacturer holding this promotional event in January 2025 for its newly launched mopeds and charging system. There is also a battery-swapping station, which enables commuters to drop in their spent cells in exchange for fresh ones with a scan of a QR code.

Yadea is one of many companies in China trying to build a competitive edge in alternative battery technologies, a trend that shows just how fast the country's clean-technology industry is developing.

Even as the rest of the world tries to close its gap with China in the race to make cheap, safe and efficient lithium-ion batteries, Chinese companies have already taken a head-start towards mass producing sodium-ion batteries, an alternative that could help the industry reduce its dependence on key raw minerals.

In April 2025, the world's largest battery manufacturer, China's CATL, announced its plan to mass-produce sodium-ion batteries for heavy-duty trucks and cars this year under a new brand Naxtra.

China's grid operators have also started to build energy storage stations using sodium-ion batteries to help the grid absorb renewables. This is an area considered by many researchers spoken to by the BBC as the main playground for the emerging technology.

Yadea has brought three sodium-powered models to the market so far and is planning to launch more. It has also established the Hangzhou Huayu New Energy Research Institute to research emerging battery chemistries, particularly sodium-ion. Two-wheelers are an extremely popular mode of transport in many Asian countries, including Vietnam and Indonesia. In China, they are ubiquitous, carrying their owners to shops, offices, metro stations and everywhere in between.

"Two-wheeled vehicles typically operate over shorter distances and at lower speeds [than cars], making them less demanding in terms of energy density and power output," says Chen Xi, who researches energy storage materials and devices at Xi'an-Jiaotong Liverpool University in China. A sodium-ion battery carries significantly less energy than a lithium-ion battery of the same size, which means it has a lower energy density.

The sheer number of two-wheelers in Asia paves a promising pathway to achieving economies of scale. In China alone, around 55 million electric two-wheelers were sold in 2023 – nearly six times the number of all pure, hybrid and fuel-cell electric cars combined sold in the country that year – according to Shanghai-based consultancy iResearch.

Scale production was the goal of Yadea. Zhou said at the talk show that the firm was seeking to bring sodium batteries to tens of millions of ordinary commuters by not only fitting them into two-wheelers, but also building a charging ecosystem to enable people to use these models without stress.

Yadea and other companies, such as battery-swapping firm Dudu Huandian, have grown so rapidly in Shenzhen the city now aims to become a "battery-swapping city". It aims to install 20,000 charging or swapping pods for various types of batteries for electric scooters in 2025, and 50,000 by 2027, according to Shenzhen Electric Bicycle Industry Association, a trade body that is working with the Shenzhen government to promote battery swapping.

6. WA gets first-ever home battery rebate and loan scheme

From Energy Source & Distribution Magazine, June 4, 2025

An estimated 100,000 households are set to benefit from a combination of state and federal election commitments. The $337 million WA Household Battery Rebate and the $2.3 billion

Federal Government Cheaper Home Batteries program will ensure around five times as many households can seamlessly access the complementary schemes than originally proposed under the State scheme.

Synergy customers are eligible to receive up to $5,000 and Horizon Power customers eligible for up to $7,500 as part of a joint effort to ensure more households are supported to invest in household batteries. In another WA first, an estimated four in five households will also be eligible to receive no-interest loans to put towards the upfront cost of buying a household battery, with households with incomes of less than $210,000 per annum to be given access to loans of up to $10,000. In line with WA Labor's commitment in the 2025 election, no-interest loans worth a total of $200 million are available.

Batteries installed through these programs will help play a vital role in securing WA's energy future, with households to be paid attractive feed-in tariffs to share their renewable power as part of Virtual Power Plants (VPPs). Through VPPs, households can sell energy stored in their battery back to the market – helping to decarbonise WA and bolster energy security, while offering financial benefits through above-average feed-in tariffs.

Applications for the rebates and no-interest loans are on track to open on 1 July 205

Federal Climate Change and Energy Minister Chris Bowen said, "West Australia's household solar uptake is world leading and getting more batteries soaking up our sunshine will be good for bills and good for the grid. It means more West Aussies will have access to cheap, fast and safe solar energy in their homes and businesses night or day, when they need it."

7. Shipping industry still at sea as it tries to navigate to net zero

By Catherine Early and Terry Slavin, June 4, Industry Insight from Ethical Corporation Magazine, a part of Thomson Reuters.

Summary

- Shipowners must cut emissions by 65% by 2040 under expected IMO rules
- Getting to Zero Coalition is driving decarbonisation across 200 maritime stakeholders
- Ammonia bunkering trials are underway, but safety concerns limit ship orders
- Maersk and Nestle are backing biofuels and dual-fuel vessels to cut emissions
- Wind-assisted propulsion is gaining traction, with fuel savings of up to 20%

The International Maritime Organization (IMO) in April agreed mandatory emissions limits and a global price on emissions of ships that exceed them, slated to come into force in 2028 if ratified later this year. Shipowners will have to reduce the greenhouse gas emissions intensity of the fuel that powers their ships by 30% by 2035 and 65% by 2040.

This follows in the wake of the European Union extending its emissions trading scheme (ETS) to shipping in 2024, and its FuelEU Maritime regulation, which came into force this year, setting lifecycle greenhouse gas (GHG) emission-intensity requirements on large vessels.

The shipping sector already accounts for 3% of greenhouse gas emissions, but its contribution could swell to 5-8% by 2050 if no action is taken, according to the Intergovernmental Panel on Climate Change.

Leading the way are members of the Global Maritime Forum's Getting to Zero Coalition, which groups 200 companies in the shipping value chain, along with key governments and NGOs. The coalition maintains that full decarbonisation by 2050 will require the uptake of scalable zero-emission fuels to displace at least 5% of the annual energy use of the sector by 2030.

LNG ships using biomethane instead of natural gas, liquid methanol, ammonia, hydrogen and biofuels are all in the running to replace oil-based fuels, which currently account for 99% of energy used in international shipping.

Fortescue has converted two of the four engines on the 75-metre Green Pioneer to run on ammonia. Last year, the vessel successfully completed the world's first dual-fuelled ammonia fuel load and trial in the Port of Singapore, and received a "gas-fuelled ammonia" notation by classification society DNV to use ammonia in combination with diesel as a marine fuel.

Though it acknowledges that there is currently not sufficient amounts of zero-carbon ammonia to supply the Green Pioneer – never mind the industry at large – Fortescue wants to catalyse jurisdictional and regulatory support for the fuel from ports worldwide so refuelling infrastructure and operational and safety know-how is ready as green ammonia producers scale supply.

Several major ports are making moves to ready themselves for ammonia, notes Andrew Hoare, Fortescue's head of green shipping. Singapore aims to install pilot bunkering infrastructure for ammonia by 2027, while in April, Rotterdam completed a trial transfer of ammonia between ships.

However, high costs and safety concerns about the toxicity and corrosiveness of ammonia have meant there are only 25 ships on order globally that would use ammonia as a second fuel. Fortescue itself has had to shelve its target to produce 15 million metric tonnes per year of green hydrogen by 2030 due to the high cost of renewable electricity, though the company still plans to make green ammonia commercially available to shipping companies from 2027.

Closer to commercial reality is methanol, which is less toxic and can be stored at ambient temperatures, although only green methanol, produced from biomass, or e-methanol - which is produced from green hydrogen, captured CO2 and renewable energy - offers significant GHG emissions savings. Shipping company AP Moller-Maersk, which has a target of net-zero emissions by 2040, now has 13 dual fuel (methanol and LNG) ships operating on the water, and another 20 ordered from shipyards in China and South Korea, with first delivery in 2028. The LNG engines can be operated using biomethane instead of natural gas.

It is offering customers an ECO Delivery Ocean option, promising at least 65% reduction in greenhouse gas emissions on a lifecycle compared with conventional fossil fuels. Nestle, which ships 100% of its Maersk ocean cargo on dual-fuel vessels, has also made a substantial financial commitment.

Last year Maersk entered into a long-term biomethanol offtake agreement with LONGI Green Energy Technology Co in China, a PV and electrolyser manufacturer, which will produce biomethanol from straw and fruit tree cuttings. Its dual-fuel ships are also being run on e-methanol from European Energy's newly opened Kasso e-methanol facility in Denmark, the

world's first commercial-scale e-methanol facility, powered by an adjacent solar park. The facility will produce 42,000 metric tonnes, or 53 million litres, of e-methanol per year, enough to power one large 16,000-container vessel sailing between Asia and Europe..

In Germany, climate tech startup ICODOS, which grew out of a research project at the Karlsruhe Institute of Technology, has begun producing e-methanol using biogas captured from Mannheim's sewage treatment plant, which it says demonstrates the enormous potential of sewage treatment plants as an energy source, with up to 75,000 across Europe.

There has also been progress on e-methanol production in the U.S. Last year, Orsted was awarded $100 million in federal funding to construct a similar facility, known as Power-to-X, along the Texas Gulf coast. The facility, which will produce up to 300,000 tonnes of e-methanol annually, will be powered by onshore wind and solar projects, and use captured carbon from an industrial facility, reducing CO2 emissions by more than 90% compared with conventional marine fuel, Orsted said.

But e-methanol remains significantly more expensive than fossil-based methanol due to high renewable electricity costs and production inefficiencies. And supportive policies such as carbon pricing, lifecycle emissions standards and green shipping corridors will be essential to scale, ICODOS's chief technology officer, Dr Francisco Vidal Vazquez said in a blog.

Pernille Dahlgaard, chief regulation and policy impact officer at the Fonden Maersk Mc-Kinney Moller Center for Zero Carbon Shipping, says there is currently no stand-out alternative fuel in terms of regulatory compliance, cost, availability and infrastructure readiness at ports. Ryan Bax, lead consultant at Lloyd's Register, says uncertainty in the market for alternative fuels is a significant barrier to uptake. "Shipping companies are waiting to see how the markets are going to develop and mature. For small companies in particular, the idea of investing in a technology with an unknown future is a major factor," he says.

Biofuels, however, are seeing increasing demand, as they do not require any changes to infrastructure on ships or in ports. Maersk first trialled powering its existing ships with 20% sustainable second-generation biofuels in 2019, while Norway's Hoegh Autoliners had a record-high delivery in 2023 of 10,380 metric tonnes of biofuel, double its 2022 volumes.

But there are sustainability concerns surrounding the provenance of biofuels. While Hoegh Autoliners' biofuel is certified by the International Sustainability and Carbon Certification system (ISCC), and derived from waste and advanced feedstocks, cheaper biofuels derived from palm and soy oil would likely make up nearly two-thirds of the biodiesel used to power global shipping in 2030, according to NGO Transport & Environment.

And once deforestation and land clearance are taken into account, fuels made from such oils would produce two to three times more carbon emissions than even the dirtiest shipping fuels today, its analysis shows.

Analysis found that operational energy efficiency technologies in shipping, such as hull and propeller cleaning, voyage planning and weather routing, can offer fuel savings of up to 15%.

For Dahlgaard, energy-efficiency technologies have several benefits over greener fuels. "Alternative fuels all come with different pros and cons and different timelines, whereas energy efficiency technology, especially on the operational side, is available right now. There's nothing that prevents you from slow-steaming, or equalising your speed," she says.

Analysis by the centre found that operational energy efficiency technologies such as hull and propeller cleaning, voyage planning and weather routing required little investment and offered fuel savings of up to 15% compared with standard operational practices.

There are numerous low-tech options for improving efficiency, with even low-energy lighting equipment – not standard design in the shipping industry – and modern hull coatings that prevent the build-up of algae and marine life to reduce friction able to reduce fuel consumption, according to a report by analysts DNV.

Other energy-efficiency options are more sophisticated. Captains and ship operators now have access to software that can evaluate millions of routes daily and alert them to more fuel-efficient routes via an app or email. For example, software startup Sofar Ocean has deployed a global network of high-tech buoys that use sensors to collect real-time data on wave and wind. These provide more accurate weather forecasts to guide captains along energy-efficient routes. Sofar Ocean claims it cut fuel use by an average of 5.5% in 2024, saving $17,700 per voyage.

Another technology that Lloyd's Register believes is at the tipping point for rapid adoption is wind-assisted propulsion systems (WAPS), which use the same principles as traditional sails, but apply advanced aerodynamics, modern materials automation and routing. According to maritime adviser DNV, around 50 commercial vessels have been equipped with WAPS as of January 2025, with most implementing the technology since 2020. Orderbooks indicate strong growth in the coming year, with 97 new builds scheduled to use the technology, it says.

WAPS are already providing fuel savings of up to 20%, DNV says, but there is potential for this to rise to 40%, depending on the technology used and the type of ship. Rotor sails – vertical cylinders which spin and generate thrust – are proving the most popular WAPS so far, followed by suction wings, which drag air across an aerodynamic surface to generate lift and propulsive efficiency.

As new regulations bed in, the next few years will be telling in terms of which technologies become mainstream, commentators believe. Though the IMO deal has been criticised by some as lacking in ambition, others in the sector believe it will provide the necessary impetus for investment in decarbonisation technologies. Emma Mazhari, head of energy markets, AP Moller, said the IMO decision had laid a solid foundation for decarbonisation. "While the recent framework awaits final adoption in October, it marks a critical milestone introducing a global structure pricing emissions and rewarding fuels with deep greenhouse gas emissions reductions."

8.Albanese announces $1.2B plan to purchase critical minerals

From an article in Energy Source & Distribution, by Michelle Grattan, Professorial Fellow, University of Canberra, April 28, 2025

Australia has major deposits of critical minerals and rare earths. But almost all the processing of critical minerals is done by China, which uses this as leverage in disputes with other countries. As part of its tariff dispute with the US, China this month suspended exports of a wide range of critical minerals and magnets.

Critical minerals are vital in the production of many items, including defence equipment, batteries, electronics, fibre optic cables, electric vehicles, magnets and wind turbines.

Prime Minister Anthony Albanese flagged recently that Australia would establish a critical minerals reserve and the government has now released details of its plan. The government investment in critical minerals would come through two new mechanisms:

- national offtake agreements
- selective stockpiling.

The government would acquire, through voluntary contracts, agreed volumes of critical minerals from commercial projects, or establish an option to purchase them at a given price. It would also establish a government stockpile of key minerals produced under offtake agreements.

Minerals held by the reserve would be made available to domestic industry and key international partners. "The Reserve will be focused on a subset of critical minerals that are most important for Australia's national security and the security of our key partners, including rare earths," the statement said. As its holdings matured, the reserve would generate cash-flow from sales of offtake on global markets and to key partners, the statement said.

The government would make an initial investment of $1.2 billion in the reserve, including through a $1 billion increase in the existing Critical Minerals Facility. This would take the government's investment in the facility to $5 billion. The facility, established in 2021, provides financing to selected projects that are aligned with the government's critical minerals strategy.

The government plans to consult with states and companies on the scope and design on the Strategic Reserve, which it would aim to have operating in the second half of next year.

9.Items from Energy Source & Distribution Magazine May/June 2025

Global News Section

Japan: Amazon has signed a 20-year Power Purchase Agreement (PPA) with EDP utilising clean energy from EDP's utility-scale solar farm in Fukushima.

Taiwan: Google's operation in Taiwan will be powered by clean geothermal energy supplied through a PPA linked with geothermal energy developer Baseland Capital. The partnership's initial project will add 10MW to the grid. Once operational in 2029, the projects will supply capacity to help power local data centres and offices.

New Zealand: Construction of Meridian Energy's 130MW Ruakaka Solar Farm south of Whangarei is set to begin in August 2025. The $227 million project is the company's first NZ solar farm (250,000 solar panels). It will be located next to Meridian's 100MW Ruakaka Battery Energy Storage System and will complete the company's Ruakaka Energy Park.

Ross Rutherford, ESR Newsletter Editor

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