

# THE ENERGY INDUSTRY TIMES

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## EU hopes of climate leadership at COP30 fade

European Climate Commissioner Wopke Hoekstra brushed aside criticism

Photo courtesy of Luxembourg times

With COP 30 less than two months away, the EU has yet to agree legally binding emission reduction targets. As right wing opposition to clean energy and net zero grows, the member states are struggling to reach a consensus on targets. **Junior Isles**

The European Union failed to agree a legally binding climate plan to cut greenhouse gases over the next decade in time for last month's UN general assembly, dampening its hopes of taking leadership on climate change at the upcoming UN COP30 climate summit in Brazil in November.

After failing to reach an agreement on its Nationally Determined Contribution (NDC), environment ministers from the bloc's 27 countries instead signed up to a "statement of intent". Members said they would aim to cut

emissions by between 66.3 per cent and 72.5 per cent by 2035. The bloc now has less than eight weeks to formally agree its NDC.

EU ministers came under fire for what has been seen as a lack of ambition. Shirley Matheson, of environment charity WWF, said: "This statement of intent is Olympic-level diplomatic gymnastics, a performance designed to avoid the embarrassment of arriving at COP empty-handed."

"When it comes to climate ambition, the EU shouldn't just be competing, it

should be setting the bar high," Matheson said. "With so many countries looking to Europe to decide on their own NDCs, this was a missed opportunity for the EU to raise the bar and inspire others to follow."

The UK leads the way on climate commitments having set its NDC at 81 per cent compared to 1990 levels, while Australia recently committed to a cut of up to 70 per cent from 2005 levels.

Denmark, which holds the rotating presidency of the EU, defended the

compromise. Lars Aagaard, its climate minister said: "We continue to stand united and will speak with one, clear voice at the United Nations. It shows a will of the EU and its member states to find solutions in and promote global climate action."

European Climate Commissioner Wopke Hoekstra also brushed aside the criticism calling the proposed range for emission cuts truly ambitious "by any international standard".

*Continued on Page 2*

## Europe needs \$3.5 trillion of power investment through 2035

Europe's power sector will need around \$3.5 trillion (€3 trillion) worth of investment over the next 10 years to reduce the risk of a European power crisis, according to Goldman Sachs Research.

The investment bank's research team said that after 15 years of declining demand, Europe's appetite for power is set to increase again, driven by widespread electrification as well as new industries such as electric vehicles and data centres.

A large part of the investment will go into capital expenditures to modernise aging power grids and improve generation capacity.

"This scenario will drive significant growth across the electricity value chain, thanks to rising investments and higher margins," said Alberto Gandolfi, Head of European utilities research in Goldman Sachs Research.

Between 2008 and 2024, power demand in Europe dropped by around 7 per cent as a result of a series of

upheavals, from the financial crisis in 2008 to the Covid pandemic. Industrial consumption has declined the most since 1990, down nearly 8 per cent cumulatively.

But now Europe's power demand is on an uptick. Goldman Sachs analysts forecast power demand will grow 1.5-2 per cent per year from 2026.

The rise in demand is the result of a number of factors. Vehicles, homes, and factories are increasingly going electric. Energy efficiency measures are approaching a plateau. More and more data centres are being constructed, and the use of air conditioning is increasing across the continent.

Europe's power generation sector is undergoing a profound change as well. By the end of the decade, its analysts estimate that around 75 per cent of the installed base will be from renewables, compared with around 45 per cent around a decade ago and about 65 per cent currently.

"Although this shift will boost

Europe's self-sufficiency and will lower carbon emissions, the power system is becoming increasingly volatile, and increasingly reliant on weather-dependent supplies" such as wind, solar, and hydropower, said Gandolfi. "This would make the system less 'secure' – unless backup measures (batteries, gas plants, power grid upgrades) are put in place."

In addition, parts of most European power grids are around 40-50 years old, and they need to be reconfigured to suit decentralised generation and new customers.

A combination of these factors could move European power markets into a deficit, with reserve margins falling to zero by 2029.

To avoid such a scenario, Goldman Sachs Research expects Europe to need total investments in the power sector of around €2-3 trillion over the coming 10 years. Compared with the past 10 years, which saw around €1.4 trillion in capital expenditure, this

implies a 60-100 per cent increase in spending.

Capex on transmission and distribution infrastructure alone could double to around €1.2-1.4 trillion over 2026-35 – a significant increase compared with the past ten years. Goldman Sachs Research estimates power generation investment needs another €1-1.4 trillion in that same period.

Such investment offers value for investors up and down the entire electricity value chain. Some electrification compounders – companies involved in the electrification of the power sector – could grow profits at between 9-11 per cent per annum over 2025-30, depending on the abundance of power.

"This capex acceleration could bring on challenges: logistics, supply chain, permitting, financing and affordability," said Gandolfi. "Yet, we should also stress that the cost of inaction could cost Europe significantly more."

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"I think we can safely say that we're still very much on the ambitious trajectory globally," he said.

UN climate chief Simon Stiell said the EU should aim "for the top of the range" in reaching agreement, noting that "the EU has so much to gain" if these targets are met "with speed and at scale". He said: "It won't just be a global leader on climate change and clean energy, the more action it takes, the more the continent stands to benefit, with stronger economic growth and thriving new industries powered by cheaper and cleaner energy."

The EU's environmental ministers, however, are facing growing opposition from right wing politicians who have become more vocal since the election of US President Donald Trump.

Ministers are also negotiating on a 2040 goal, towards an agreed pledge of net zero emissions by 2050 but France, Germany, Poland and others forced a debate on the EU's 2040 climate target after the European Commission proposed a 90 per cent cut. EU leaders will discuss it at a summit on October 23-24. Meanwhile, several countries want more flexibility in meeting the target and net zero goal by 2050.

Last month former US Vice-President Al Gore accused Trump's administration of bullying countries to abandon their climate change policies by linking them to trade deals. The US had set a target of 61-66 per cent below 2005 levels but withdrew from the Paris Agreement when President Trump took office in January.

In an interview with the *Financial Times*, Gore said the Trump administration is "actively attempting to slow down the pace of the energy transition in every way that they can".

In mid-September he told the *FT*: "We have seen, just in the last week, a tour of Europe by a couple of the Trump officials trying to put pressure on other nations to change their policies and goals," he said.

US Energy Secretary Chris Wright, who visited the continent in September, warned the EU that its climate policies and "crusade" to achieve "net zero" greenhouse gas emissions by 2050 posed a major threat to the EU-US trade deal.

Gore said some countries were responding to the US pressure with "greenhushing", referring to the tactic of climate efforts being played down or kept quiet.

However, he said trade threats as an "effective bullying tactic is going to be a diminishing asset [for Trump], because the rest of the world is just on to the fact that it's nuts".

"I think that most countries are going to continue moving forward [on climate action] in spite of whatever pressure Trump tries to put on," Gore added.



Photo by LinkedIn

**US Energy Secretary Chris Wright says EU climate policy threatens trade deal**

# US-UK agree nuclear accord, but sector faces obstacles in EU

- Deal will enable major expansion of new nuclear projects in the UK
- Two-fifths of nuclear capacity planned for Europe either cancelled or retired

Photo by www.pexels.com

## Junior Isles

Investment in UK nuclear energy received a boost last month, with the signing of a new accord between the UK and the US. But the outlook for the rest of the continent appears gloomy despite strong growth being predicted globally.

The UK-US civil nuclear partnership will enable major expansion of new nuclear projects in the UK, and builds on investments made earlier this year in Sizewell C, small modular reactors (SMRs) and fusion.

Britain's Prime Minister Sir Kier Starmer said the agreement promised a new "golden age" for nuclear power. "Together with the US, we're building a golden age of nuclear that puts both countries at the forefront of global innovation and investment," Starmer said.

US Energy Secretary Chris Wright said US President Donald Trump was "ushering in a true nuclear renaissance" and that the deals announced during the recent US visit would secure nuclear supply chains across the Atlantic.

In response to the announcement of the UK-US civil nuclear partnership, Professor Fiona Rayment OBE,

President of the Nuclear Institute said: "We welcome the US-UK deal... This announcement again confirms nuclear's vital role in ensuring energy and national security, as well as delivering high-skilled, well-paid jobs across the country."

However, Dr Douglas Parr, Chief Scientist for Greenpeace UK, criticised the deal, saying: "Britain is a world leader in offshore wind, battery technology and other genuinely clean, affordable tech – we should be focusing there rather than [on] slow, costly reactors which produce waste that we still have no plan to handle after 60 years of trying."

"There is no evidence that small modular reactors have changed any of that."

Nevertheless, global momentum continues to build around the technology, which is seen as important in combatting climate change. In September, for the fifth year in a row, the International Atomic Energy Agency (IAEA) revised up its projections for the expansion of nuclear power.

In the high case projection, the IAEA estimates that global nuclear operational capacity will more than double by 2050 – reaching 2.6 times the 2024 level – with small modular reactors (SMRs) expected to play a pivotal role

in this expansion.

In 2024, nuclear reactors supplied more electricity than ever before, according to the 'World Nuclear Performance Report 2025' published by the World Nuclear Association. The global reactor fleet ran at an average capacity factor of 83 per cent in 2024, higher than any other source of electricity, it said.

The increase in global nuclear generation seen over recent years is primarily due to a rapid increase in new capacity in Asia. Of the 68 reactors commissioned worldwide over the past decade, some 56 were built in Asian countries.

Europe, however, continues to struggle with only one plant connected to the grid in 2024.

There are about 100 nuclear plants operating in the EU, and several countries, including France, Romania, Poland and Sweden, have recently announced plans to build new reactors. Belgium has reversed a plan to phase out nuclear power and Denmark is considering embracing the energy source.

But the nuclear renaissance in Europe faces significant challenges, according to a new report by Global Energy Monitor (GEM), which outlines how frequent project cancella-

tions and delays could hinder the continent's decarbonisation drive.

Nearly 40 per cent of nuclear power projects proposed across the world have been cancelled, according to the group. It found two-fifths of the nuclear capacity planned for Europe had been either cancelled or retired.

"To meet 1.5°C climate targets, technologies that deliver emissions cuts quickly are essential. New nuclear power, with its long development times and risks of delays and overruns, may not scale fast enough to contribute significantly when it matters most," said Joe Bernardi, project manager of the global nuclear power tracker at GEM.

Nuclear's share of electricity generation in the EU fell from 25 per cent in 2005 to under 20 per cent in 2024, according to GEM. The group estimates that the new nuclear capacity under construction is intended to replace retiring units, not expand total capacity.

Last month, the European Court of Justice struck down an EU approval for Russia to build a nuclear power plant in Hungary, arguing that it was unclear whether Viktor Orbán's government followed EU procurement rules when awarding Rosatom the contract without a public tender.

## Russian oil and gas imports complicate EU-US relations

US Energy Secretary Chris Wright has said European countries should stop buying Russian oil and gas if they want Washington to tighten sanctions on Moscow. He said European countries should instead buy American liquefied natural gas, gasoline and other fossil fuel products to meet the terms of the US-EU trade deal, which calls on EU countries to buy \$750 billion of US energy by the end of 2028.

Speaking to the *Financial Times*,

Wright said: "We think it's good economically for Europe. You want to have secure energy suppliers that are your allies, not your foes... the other reason is a huge goal of the Trump administration, and I believe of the EU, is to end the Russia-Ukraine war. Russia funds its war machine off oil exports and natural gas exports and if you cut off European purchase of those, it shrinks their money."

He said the EU could phase out

Russian gas within six to 12 months by replacing it with US liquefied natural gas

President Trump has said he is open to new measures targeting Russia in conjunction with the EU such as potential secondary sanctions against China – a major buyer of Russian oil and gas – and other countries that buy Russian oil.

The Trump administration has already imposed a 50 per cent tariff on

Indian imports in response to the country's continued purchase of Russian oil.

EU officials and diplomats have now begun negotiations over what could feature in a new sanctions package, but are reluctant to follow suit on India and China. Further, secondary sanctions are controversial and would require unanimous backing by the EU's 27 members – with Hungary and potentially Slovakia likely to oppose the move.

## Green groups blame clean energy cuts for higher electric bills

Green groups in the US are blaming Republicans for voting to raise electric bills by passing the "one, big beautiful" bill, a law that cuts funds for new clean energy projects.

Prices have hit record highs in 2025, with the average residential cost of electricity up 7 per cent since last June and commercial rates 5 per cent higher, according to the Energy Information Administration.

Yet prices have remained high despite Trump pledging on the campaign trail last year that he would "cut your energy and electricity prices in half, within 12 months of taking the oath of office", as he blamed Democrats' decarbonisation programme for higher costs.

President Trump has labelled Democrats' support for wind and solar as the "scam of the century" and says that they are behind the "record breaking" price increases in states that support them. His Energy Secretary, Chris Wright, has also blamed Biden-era policies.

Since taking office, the US President has set about reversing those policies. Late last month the US Department of Energy said it intends to cancel more than \$13 billion in funds that the Biden administration had pledged to subsidise wind, solar, batteries and electric vehicles.

President Trump is taking a particularly aggressive stance against offshore wind. Last month the govern-

ment filed a motion in US District Court in Maryland to cancel the permit for the Ocean City offshore wind farm. In August, the federal government withdrew and terminated funding for 12 offshore wind-related port upgrade projects, totalling \$679 million, saying that these funds would be used, where possible, "to invest in real infrastructure".

This was announced only days after the Department of Interior (DOI) issued a stop-work order for Revolution Wind, a nearly built offshore wind farm that is set to serve Connecticut and Rhode Island. Since then, construction has resumed following a temporary injunction that lifted the stop-work order.

US Interior Secretary Doug Burgum said at a gas industry press conference in Milan on September 10 that offshore wind has no future in the US under the Trump administration and that the government was reviewing five offshore wind projects that are now under construction.

The DOI and the Bureau of Ocean Energy Management (BOEM) also plan to file motions to "remand with vacatur" for two more offshore wind projects that received federal approvals of their Construction and Operations Plans – Avangrid's New England Wind and Ocean Winds' SouthCoast Wind offshore wind projects, both approved to be built in the federal waters off Massachusetts.

## Americas News

# Storage market continues to expand

■ Argentina secures capacity for Buenos Aires area ■ US investors positive

Photo by Alex Dos Santos

Janet Wood

Argentina's national government has announced the results of the Alma-GBA tender for battery projects in the Buenos Aires Metropolitan Area. A total capacity of 667 MW has been awarded, exceeding the initial target of 500 MW by 30 per cent. In addition, the Energy Secretariat invited five other projects, totalling 222 MW, to sign contracts.

The total planned investment for these projects is expected to exceed \$540 million and they are due in operation within 12 to 18 months.

The tender is Argentina's first battery initiative to strengthen grid reliability and forms part of the contingency plan introduced in 2024 to upgrade electricity infrastructure.

The storage market in the USA is more advanced and faces increasing risks but investors remain confident in the sector, according to findings from law firm Troutman Pepper Locke in a report, 'Brave New World: What's Next for US Energy Storage After OBBBA and Amid Continued Tariff Risk?'

The report says storage is seen as a service for grid resilience and power

price stability, as well as for decarbonisation. Co-author and Troutman Pepper Locke partner Vaughn Morrison said: "Energy storage's versatility of use cases has untethered it from the fate of wind and solar to a meaningful degree."

The report said its "clear value proposition for grid reliability, economic development, and national security has meant energy storage retains an integral role in the US's energy future".

The report found that project owners expect to be better placed to plan for risks and move their projects forward

as the implications of President Trump's 'One Big Beautiful Bill Act' and tariffs become clearer.

John Leonti, partner and chair of the Energy Department at Troutman Pepper Locke, said: "The most prepared in the sector have acted nimbly to restructure supply chains, and key stakeholders are strengthening their close working relationships to share risk and collaboratively revise strategies."

Reasons for continued optimism include the data centre industry, which requires reliability from energy providers in order to grow.

But there are concerns over issues

such as tariff hikes on China – the source of the majority of the world's battery components.

Investors underlined the difficulty of forecasting scenarios given that the supply chain capacity needed for US energy storage currently far exceeds what can realistically be manufactured domestically.

The report comes as Ormat Technologies announced the successful commencement of commercial operations at a 60 MW/120 MWh battery located in Texas. The plant will provide energy and ancillary services under a seven-year tolling agreement.

## TVA announces fusion plan for ex-fossil site

Tennessee Valley Authority (TVA) plans to build, own and operate "at least one" nuclear fusion plant at the retired coal fired Bull Run site near Oak Ridge, Tennessee. It will use stellarator technology from Type One Energy.

Type One said it expects to complete design, permitting and environmental review by 2029. It said the plant will cost "several billions of dollars" and produce power at a rate "cost-competitive with coal and natural gas". Type One Chief Executive Chris Mowry told the *Financial Times*: "This really is a watershed moment in the history of fusion."

Meanwhile, Commonwealth Fusion Systems raised \$863 million from backers including NVentures (Nvidia's

venture capital arm), Morgan Stanley's Counterpoint Global and a consortium of 12 Japanese companies led by Mitsui & Co. It said it plans to use the money to complete its Sparc demonstration machine and begin work on a power plant in Virginia. The group secured a deal in June to supply 200 MW of electricity to technology group Google.

CFS has raised almost \$3 billion since it was spun out of the Massachusetts Institute of Technology in 2018. "Investors recognise that CFS is making fusion power a reality. They see that we are executing and delivering on our objectives," said Bob Mumgaard, Chief Executive and co-founder of CFS.

## Canada sees overall emissions rise despite fall in electricity sector

Although Canada's electricity sector reduced its carbon emissions in 2024, overall Canada's emissions flatlined in 2024, according to the latest Early Estimate of National Emissions (EENE). The Canadian Climate Institute said emissions trends indicate Canada's 2030 target of a 40 to 45 per cent reduction in emissions is now out of reach, as it is expected to be just 20 to 25 per cent below 2005 levels in 2030.

Electricity emissions dropped 1.9 per cent to 59 per cent below 2005 levels, but the year saw rising emissions from oil and gas, particularly oil sands production. Overall, oil and gas emissions rose 1.9 per cent and accounted for 31 per cent of the national total in 2024. Setbacks include the repeal of the consumer carbon tax, delays to federal and

provincial electric vehicle policies, and weakened industrial carbon pricing in several provinces. Plans including the expansion of liquefied natural gas production could further lock in emissions-intensive growth.

The group said policy priorities should include action to modernise industrial carbon pricing, finalisation of new methane regulations for oil and gas, investment in clean electricity and making cleaner fuels and vehicles more affordable and widely available.

"With emissions flatlining and important policies being scaled back, Canada's 2030 target is now out of reach – and the longer we take to get back on track, the more Canadians will pay the price," said Rick Smith, President, Canadian Climate Institute

## Offshore wind remains a focus for investment

Photo by  
Jem Sanchez

■ Brazil hopes to benefit from Trump retreat  
■ California votes for funding to upgrade ports

Janet Wood

Brazilian wind energy representatives have suggested that any US withdrawal from offshore wind could benefit the South American country's first uses of the technology.

Brazil's SENAI Institute of Innovation in Renewable Energy (ISI-ER) and SENAI's Rio Grande do Norte branch, SENAI-RN, expect to receive an installation permit for a two-turbine, 24 MW pilot project, the country's first offshore wind project to be granted a preliminary licence, within 12 to 18 months and to have it operational within 36 months.

The Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) had received 98 formal requests for licensing of offshore wind farms by the end of last year. The Brazilian government intends to hold the first auction of areas in the sea for wind exploration in the second half of this year.

Speaking about the uncertainty over

US offshore wind projects, Elbia Ganoum, President of the Brazilian Association of Wind Energy and New Technologies (Abeecólica), said: "This setback in the climate and energy transition was already expected. But it is clear that, with the decision taken, there will certainly be a reversal in the capital path. There was a lot of money from the wind sector migrating to the United States. Now, the market will seek another path and there is a tendency for investment to migrate to Brazil."

Meanwhile, a vote in the California Legislature will allocate \$225.7 million in the current budget bill to upgrade port infrastructure to support further development.

"Oceanic commends Governor Newsom, the California Legislature, and state leaders for moving forward foundational infrastructure for the US offshore wind industry that will deliver jobs and economic activity for decades," said Nancy Kirshner-Rodriguez, Senior Director of Policy and

Outreach at Oceanic Network, a grouping of US offshore renewable energy companies. She added: "While the federal government is attacking needed energy and infrastructure projects, California's leadership is driving the market forward, delivering significant economic support that will result in local port investment and create new jobs."

In December 2022, the Bureau of Ocean Energy Management (BOEM) held an auction that brought in \$757 million for the rights to five offshore lease areas in Californian waters.

The state's long-term goal is to achieve 25 GW of offshore wind capacity by 2045.

Offshore Wind California said: "Today's action is another important proof point of California's progress and continued support for offshore wind, which has the bipartisan backing of 75 per cent of all California adults according to the latest statewide survey by the Public Policy Institute of California."

## Supply chain builds capacity as US load continues to grow

US load growth was recently estimated by Wood Mackenzie at 116 GW of large load capacity committed or under construction – equivalent to 15.5 per cent of current US peak demand in a study of major investor-owned utilities. Adding projects in advanced discussion brings the total to 147 GW, or

20 per cent of US peak demand.

The report, 'No turning back, an analysis of utility large load pipelines', shows 60 GW of that will be added by 2030. "Utilities are committing to large loads ramping rapidly this decade," said Ben Hertz-Shargel, global head of Grid Edge for Wood Mackenzie.

The supply chain has responded to the growth in generation and networks. Most recently Hitachi Energy announced it would invest \$1 billion to expand the production of critical electrical grid infrastructure in the USA, including \$457 million for a new large power transformer facility in South

Boston, Virginia, along with significant expansions of existing facilities throughout the country.

"Investments like this are essential to powering AI infrastructure and advancing President Trump's leadership in the global AI race," said Jarrod Agen, Executive Director of the White House

National Energy Dominance Council.

"A vigorous and reliable electric grid is critical for the American economy and American energy dominance. Bringing power transformer production to the US is vital as energy demand skyrockets," said Congressman John McGuire.

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# Indonesia's local solar ambition faces challenges

- Cooperatives lack technical expertise
- Foreign involvement needed to boost solar manufacturing capacity

Photo by Tom Fisk

Syed Ali

The Indonesian government's plan to deploy 100 GW of distributed solar power by leveraging the nationwide Red and White Cooperatives (KMP) programme may face challenges due to the operators' limited technical and financial capacity, analysts have warned.

While officials hail the scheme as a masterstroke in the grassroots energy transition, experts point to a huge gap between ambition and reality.

Key concerns include the cooperatives' lack of technical expertise, the immense financial investment required and the current state of Indonesia's domestic solar manufacturing, which experts say is far from ready to meet such colossal demand.

As a result, the programme may face delays or risk dependence on foreign equipment, undermining its domestic economic goals.

In July, Coordinating Food Minister Zulkifli Hasan stated that the government planned to accelerate the adop-

tion of solar power at the local level through more than 80 000 newly launched village-level cooperatives.

The initiative, which could cost around \$100 billion, would involve building solar farms of 1 to 1.5 hectares in villages of every sub-district across the archipelago.

"If each village generates its own power, we will not need long-distance transmission like [that provided by] PLN," added the minister, who also leads the task force behind the cooperative's initiative.

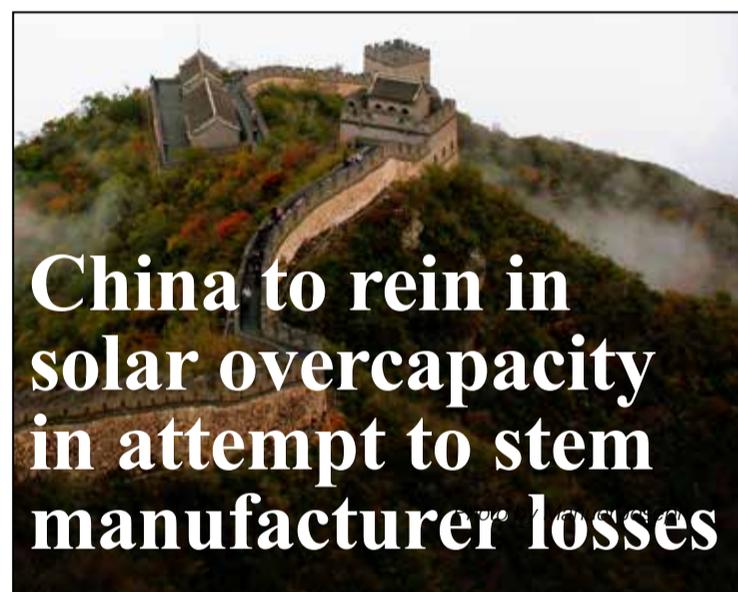
The government says opportunities are wide open for foreign investors who wish to take part in its plan to deploy solar power to its villages.

Energy Minister Bahlil Lahadalia recently told reporters in Jakarta: "Well, obviously, this 100 GW solar panel project is pretty huge in capacity. Our domestic industries can only produce no more than 5 GW a year. To this end, we will look for foreign investors who wish to partner with Indonesian business people and state-run enterprises, including [the

government-owned utility firm] PLN."

Indonesia has an estimated solar power potential of between 3300 GW and as much as 20 000 GW, according to energy think-tank IESR. If the government can execute its solar power plan, IESR revealed it could be Southeast Asia's largest rural electrification initiative.

Bahlil did not go into details on whether Indonesia would offer incentives for the foreign investors in the project.



## China to rein in solar overcapacity in attempt to stem manufacturer losses

The Chinese government has instructed the solar sector to reduce overcapacity and aggressive pricing, as its biggest manufacturers experience losses of billions of dollars.

Six of China's biggest cell and panel makers saw their combined first-half losses double to Rmb20.2 billion (\$2.8 billion) from a year earlier, with all but one reporting widening losses, according to financial information provider Wind. The losses compare with record profits in 2022 and 2023.

Solar is one of the industries at the heart of Beijing's concerns about "inflation", which refers to excess production fuelling a race to the bottom in prices. It has added to the country's deflationary pressures, a

key economic problem for President Xi Jinping, and fuelled tensions with trading partners as companies turn to exporting their products.

In early July, executives from 14 of China's largest solar companies were called to Beijing, where newly appointed Industry Minister Li Lecheng said companies must "resolutely crack down" on disorderly competition and speed up the closure of under-utilised factories.

However, Li also noted that the sector had transformed "from weak to strong" and now boasted a "leading edge" in scale and technology, highlighting the tension between reining in the industry and encouraging sector innovation.

## South Korea may be cooling on new nuclear as renewables become the focus

The South Korean government has questioned proposals to use nuclear energy for powering data centres while at the same time reaffirming support for the renewable energy industry.

Environment Minister Kim Sung-hwan recently raised the possibility of halting plans to build new nuclear power plants, saying such plans need to be reviewed by public opinion.

"The 11th basic plan is the government's current plan and needs to be respected," Kim said during a press conference last month. "On the question of building new nuclear reactors, there have been calls to make a decision after listening to public opinion."

During the press conference, President Lee Jae Myung also dismissed concerns from industry insiders and academics that the environment ministry's proposed oversight of energy policies could result in stricter regulations instead of promoting the sector's growth.

"It takes at least 15 years to build a nuclear plant, and Korea now lacks sites for new facilities except for one location that had been designated long ago."

Regarding the use of small modular

reactors (SMRs), he perceived development of relevant technologies as still immature.

"The fastest way to boost electricity supply is through solar or wind power generation," Lee said. "Since renewables are the only viable solution, we will focus on developing this sector."

Lee's comments came a day after Environment Minister Kim Sung-hwan suggested the government may reconsider its planned construction of two full-size reactors and one SMR. That plan was finalised under the previous administration's 11th Basic Plan on Electricity Supply and Demand.

"We should respect the 11th Basic Plan," Kim told reporters. "On construction of new nuclear plants, there is an argument that the government should listen to public opinion."

Following Lee's latest remarks, the government is widely expected to drop plans for new reactors in the upcoming 12th Basic Plan, set to be finalised by the first half of next year.

"We need to maintain existing nuclear plants and complete those currently under construction, while extending the operations of older plants if their safety is assured," Lee said.

"Ultimately, we have no choice but to transition to renewables."

According to the Ministry of Trade, Industry and Energy's 2026 budget plan released on September 1, 2025, the budget for renewable energy for 2026 has been set at Won1.27 trillion (\$911.39 million), up Won 373 billion, or 41.6 per cent, from 2025's Won897.3 billion wn figure.

By contrast, the nuclear power budget for 2026 stands at Won519.4 billion, an increase of just Won30.5 billion, or 6.2 per cent, from 2025.

The shift toward renewables began with the second supplementary budget in July 2025. At that time, the government allocated an additional Won111.8 billion for renewable energy, but none for nuclear power.

Based on both the July supplementary budget and 2026's main budget, the budget for renewable energy has risen by Won485.8 billion, while the nuclear budget increased by just Won30.5 billion, a tenth of that amount. The government intends to use the expanded renewable energy budget to implement what it calls an "energy transition centred on renewables," the ministry said.

## Philippines seeks partners to further accelerate renewables drive

The Department of Energy (DOE) is actively seeking more foreign investors to bolster the Philippines' renewable energy (RE) sector.

In September Energy Secretary Sharon Garin detailed potential partnerships to attract Japanese interest as the Philippines aims for a 35 per cent RE share in its energy mix by 2030 and 50 per cent by 2040.

To achieve these goals, Garin said the country is looking to increase investments in solar, wind, and geothermal projects, as well as integrate

advanced grid technologies to support both current and future developments.

As the government prepares for the fifth Green Energy Auction (GEA-5) for offshore wind (OSW) projects, Garin said the DOE is also encouraging Japanese investors to help develop port facilities crucial for unlocking an estimated 178 GW of OSW capacity.

Meanwhile, Meralco PowerGen Corp. (MGen) is ramping up its strategic partnership with Korea Electric Power Corp. (KEPCO), signalling a potential expansion beyond solar

power projects.

MGen, the power generation arm of industry local giant Manila Electric Co. (Meralco), has expressed its interest in developing other renewable energy projects with the South Korean firm.

These renewables projects, MGen said, could include wind and energy storage systems as part of efforts to further strengthen its presence in the Philippines.

"Our strengthened partnership with KEPCO underscores MGen's

commitment to advancing clean energy and supporting the country's sustainability goals," MGen President and CEO Emmanuel Rubio said.

The news came as the Marcos administration is studying mechanisms to reduce the cost of developing offshore wind projects following its geothermal de-risking strategy, a senior energy official said.

Energy Undersecretary Rowena Cristina Guevara said the Philippines is currently in talks with multi-lateral banks and looking at ways to lower

the high capital requirements for the technology.

"Offshore wind is capital-intensive, and emerging markets face higher financing costs due to perceived risks like typhoons," Guevara explained at the APAC Wind Energy Summit in Australia.

The government, she said, is likewise considering the implementation of "blended finance and risk-sharing instruments" to address the financing challenges faced in offshore wind farm development.

# EU Commission President stresses renewables' role in energy independence

Photo by Narcisa Aciko

- Pushes further electrification and build-out in annual speech
- Wind lobbyists warn over delays to offshore wind build-out

Janet Wood

Economic competition and national security are intertwined, and Europe must invest in digital and clean technologies to ensure the future continues to be made in Europe. And to keep its place in the world, Europe needs to take control of the energies and technologies which fuel its economy because international “dependencies are ruthlessly weaponised”.

That was the message from EU Commission President Ursula von der Leyen, in her recent annual State of

the Union address.

Amid increasing geopolitical uncertainty, she stressed the urgent need to implement Europe’s Clean Industrial Deal. “This transformation is central to our push for independence”, von der Leyen said, promising to “get rid of dirty Russian fossil fuels completely”.

The EU Commission President also spoke about direct electrification of Europe’s economy, including new initiatives on electric vehicles and batteries, and crucially, investment in grid infrastructure and interconnections.

New European legislation on grid

expansion is due before the end of this year and a new European Energy Highways initiative will try to unblock eight critical cross-border grid bottlenecks.

A report by the European Climate Neutrality Observatory noted where the EU is on track to meet its climate ambition and where additional efforts are needed. The European Commission has tabled the Clean Industrial Deal in response to these challenges, integrating policy priorities around competitiveness and decarbonisation. The report said that along with setting

the EU’s next long-term budget (for the period 2028-2034), the measures open a window of opportunity to align EU policy with long-term priorities.

The report coincided with new figures from WindEurope, which showed the current project pipeline and auction schedules should get Europe from 37 GW to 80 GW of offshore wind by 2030. But Europe built only 6.8GW of new wind in the first half of 2025 – less than expected and too little to meet the EU’s 2030 energy security and climate targets, although the group said Europe’s offshore wind supply chain can

now produce at least 10 GW a year.

WindEurope Chief Executive Giles Dickson said: “The EU Commission is clear: we need more home-grown wind energy. It’s time to seriously ramp up wind energy in the EU – we only built 5 GW in the first half of this year. Governments have got to pull their finger out – apply the EU permitting rules, build out the grids more quickly, push electrification.”

WindEurope said it was key that Member States agree a new deal for offshore wind at a summit in Hamburg in January.

## UK puts small nuclear projects on the fast track

A three-way partnership to develop data centres powered by Holtec’s SMR-300 small modular reactors (SMRs) at the UK’s former Cottam coal fired power station site has been signed by Holtec, EDF and Tritax.

The deal followed a new agreement between the US and UK governments that will make it quicker for companies to build new nuclear stations in both countries.

Dr Kris Singh, Chairman and Chief Executive of Holtec International,

said: “The SMR-300s at Cottam represent a potential \$15 billion project, creating thousands of local jobs while drawing on the lessons from our Palisades project in Michigan.”

The 900-acre Cottam site will be home to a 1 GW data centre project, which will be powered mainly by renewable generation until the SMR becomes operational in the 2030s.

Meanwhile, the *FT* reports that Rolls-Royce has held exploratory talks over new financing options for its SMR

business, which may include an initial public offering. It is leading a consortium that is in talks to finalise a contract with the UK government later this year. Other members of the consortium include CEZ Group (with a 20 per cent stake), Qatar Investment Authority and BNF Resources.

UK government funding for Rolls-Royce, which is still subject to final agreements, involves support to help the development of three reactors totalling 1.5 GW.

## Microgrids recommended to speed up data centre connections

Half the data centre industry thinks new projects will connect within two years, but the reality is up to eight years, according to a new report, ‘Powering Great Britain’s Data Centre Ambitions’, from grid consultancy Roadnight Taylor.

Chief Executive Hugh Taylor said: “Data centre developers are facing mounting grid connection challenges that can derail even the most promising projects.”

The survey of data centre developers found delays because of energy cost and pricing uncertainty (36 per cent), technical issues during connection (32 per cent) and infrastructure upgrades (26 per cent). It said cost and connectivity restrictions had led to

half of projects changing locations.

Another recent report claimed microgrids as a solution to incorporating data centres. Wärtsilä Corporation and AVK-SEG said microgrids, comprising renewable energy, grid balancing and energy storage, can create “a significant bank of flexible capacity for balancing the European grid”.

Anders Lindberg, President of Wärtsilä Energy and Executive Vice President of Wärtsilä, said: “By investing in microgrids, data centres can sidestep energy constraints, and with the right technology mix of renewables, grid balancing engines and energy storage, can ensure their emissions profiles and costs do not outweigh the huge benefits that AI brings”.

## Report argues gas fired stations should not be in wholesale market

Great Britain could cut its energy bill by £5 billion a year by if gas fired power stations were no longer the ‘marginal plant’ that sets prices for the wholesale market, according to a new report co-authored by Adam Bell, the government’s former head of strategy at the Department for Energy Security

and Net Zero.

The report argues that the UK’s gas plants should be held in strategic reserve, available when needed without distorting the cost of electricity in the wholesale market.

Gas generation in May and June in GB was the lowest ever recorded for

those months, as it was displaced by strong wind and solar generation. But even though GB is sourcing more of its electricity from renewables, it relies on gas plants for about a quarter of its annual electricity use, and they play a much greater role during spells of low wind and low solar generation.

The report has emerged amid growing concern over the price of electricity in the UK, which has some of the highest energy costs among developed economies. The price of generating power from gas continues to keep overall costs high, because it is the ‘marginal price’ almost all of the time, and

much more often than is the case in its European neighbours, where the average is less than half the time.

Bell, now Policy Director at Stonehaven consultancy said: “The government has very few options to cut bills, and none with as high a return as our proposal.”

## Germany faces ‘reality check’ over green plans

- Merz promises new focus on security
- Green hydrogen stutters in both demand and supply

Janet Wood

German Economy Minister Katherina Reiche has described a new report on the country’s energy transition as a “reality check”, after it found that faster expansion of renewable generation, electricity networks and flexibility options is required to meet Germany’s targets. It also concluded that cost efficiency had been given insufficient importance.

The economy ministry, which commissioned the report, said it had revealed uncertainties regarding future demand for electricity and hydrogen,

as well as “glaring gaps” in transition scenarios.

“In particular, insufficient attention has been given to the actual ability to pay of industry, commerce and households,” it said.

Even before the report was published, Chancellor Friedrich Merz had said Germany would slow the roll out of renewables. Merz said: “If we want to remain an industrialised country, we must have a secure energy supply. For the time being, at least, we cannot guarantee this with renewable energies alone.”

The Merz government had already

dropped a requirement that new gas power plants be ready to run on hydrogen. Green hydrogen costs around twice the price of hydrogen produced from natural gas and in June, Arcelor-Mittal, Europe’s biggest steel producer, abandoned plans to convert two German plants to green production, turning down €1.3 billion in public subsidies aimed at supporting the change.

Miguel Ángel López Borrego, Chief Executive of German steel major Thyssenkrupp, told the *Financial Times* he would “prefer to start reducing carbon dioxide in, I don’t know, 2028 with

[methane] gas instead of waiting for the green hydrogen”.

Jan Taschenberger, Chief Operating Officer of new green power and gas at hydrogen supplier Uniper, said: “I can have the best product on earth but if there’s no demand, it doesn’t matter”. He said there was a danger that the sector had entered the “trough of disillusionment”.

Germany aims to bring its renewable share in power consumption to 80 per cent by 2030, and have an almost climate-neutral power supply when coal comes off the bars, planned by 2038. Meanwhile re.venture has announced

the development and construction of a 60 MW/240 MWh battery in Brandenburg, Germany.

Construction is set to begin in 2026, with commissioning planned for 2027. The site is in a region that is particularly susceptible to grid bottlenecks due to its high proportion of renewable energy generation.

“Thanks to response times in the millisecond range, the system compensates for fluctuations almost immediately – and can even support the grid restart in an emergency,” said Ingo Ernst, CTO & Co-Founder of re.venture.

## International News

# Financial close for \$4 billion Saudi investment

Photo by waleed-aleid

- Two CCGT plants will add 3.6 GW of capacity
- New tender round to procure 5.3 GW of renewables

Nadia Weekes

Abu Dhabi National Energy Company PJSC (TAQA), Japan's JERA and developer AlBawani Capital have announced the successful financial closing of two greenfield combined cycle gas turbine (CCGT) power plants in Saudi Arabia.

Together, the Rumah 2 and Al Nairyah 2 power plants will deliver 3.6 GW of power generation capacity. The projects are being developed on a build, own and operate basis.

The two projects represent a combined investment of approximately

AED14.7 billion (\$4 billion), backed by 25-year power purchase agreements (PPAs) with the Saudi Power Procurement Company (SPPC) under the supervision of the Saudi Ministry of Energy.

Financing was secured from a consortium of regional and international lenders through senior debt and equity bridge loans.

Construction will be undertaken through special purpose entities owned by TAQA (49 per cent), JERA (31 per cent) and AlBawani (20 per cent). Operation and maintenance (O&M) will be performed by specialist

companies owned by the consortium under the same shareholding structure.

China's Harbin Electric International and Tiesiju Civil Engineering Group secured engineering, procurement and construction (EPC) contracts. Siemens Energy is the original equipment manufacturer (OEM) for the projects.

Both plants will deploy state-of-the-art CCGT technology and are designed for future carbon capture integration, supporting the Ministry of Energy's decarbonisation goals set out in the Saudi Vision 2030.

In a separate development, SPPC has issued a request for qualification (RFQ) for the seventh round of solar and wind projects under the National Renewable Energy Program (NREP) led by the Ministry of Energy.

The round covers a total capacity of 5.3 GW, comprising four solar PV projects and two wind projects across the country.

The solar projects include the 1.4 GW Tabarjal Two project in Al-Jouf, the 600 MW Mawqaq project in Hail, the 600 MW Tathleeth project in As-eer, and the 500 MW South Al Ula project in Madinah.

The wind projects consist of the 1.3 GW Bilghah project and the 900 MW Shagran project, both located in the Madinah region.

SPPC will be responsible for feasibility studies, tendering and concluding power purchase agreements (PPAs) with developers.

SPPC has launched renewable projects with a capacity of more than 43 GW, with PPAs in place for over 38 GW of renewable energy projects.

Saudi Arabia has plans to increase the share of renewables in the country's energy mix to around 50 per cent by 2030.

## Türkiye to hold 2 GW renewable energy tender

- Wind and solar capacity set to quadruple by 2035
- Plans for nuclear boost plus DC and AC grid upgrades

Nadia Weekes

The Turkish government has announced it will hold its second round of renewable energy capacity allocation tenders under the Renewable Energy Resource Zone (YEKA) auction mechanism before the end of the year, offering 2 GW for new wind and solar power plants.

Energy and Natural Resources Minister Alparslan Bayraktar said that 1150 MW will be allocated for wind projects and 850 MW for solar through an open reverse-bidding method based on a guaranteed electricity purchase price starting at €55/MWh (\$64.4/MWh), with floor prices set at €35 for wind and €32.5 for solar.

Türkiye currently has 36 GW of installed wind and solar capacity, and aims to quadruple that figure by 2035. With limited oil and natural gas

resources, the country relies on vast energy imports. Electricity consumption has tripled in the last two decades and is expected to increase even faster as the country replaces fossil fuel energy with electricity.

The YEKA scheme was introduced in 2016 to facilitate land allocation for investors and ease the deployment of large projects. The government updated the model last year to draw greater investor interest, introducing simpler post-tender permitting procedures and financial incentives like exemptions from transmission fees.

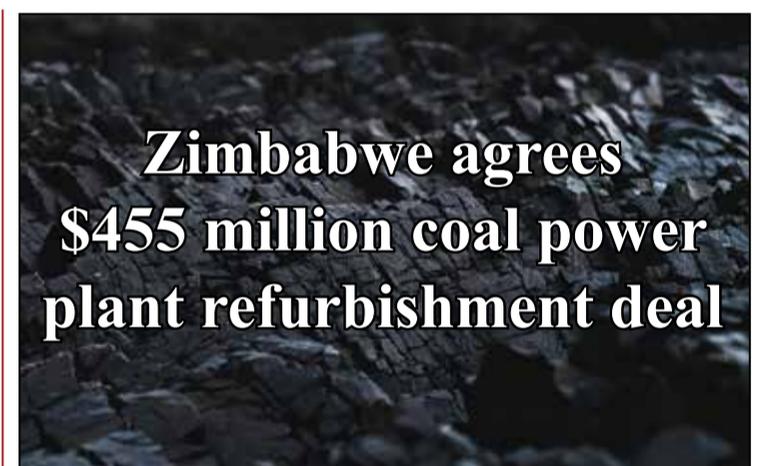
The government also plans to strengthen transmission infrastructure with 14 700 km of high-voltage direct current (HVDC) lines totalling 40 GW of capacity, alongside an additional 15 000 km of alternating current lines.

Meanwhile, Industry and Technology Minister Mehmet Fatih Kacir has

launched a national call to develop indigenous nuclear reactors, with the aim of strengthening Türkiye's energy security and reducing dependence on foreign sources while supporting the country's net zero emissions target.

Türkiye's first nuclear power plant, Akkuyu, is being built by Russian conglomerate Rosatom in the Mediterranean region, with the first of four reactors just months away from completion. Once fully operational, the 4.8 GW power plant is expected to generate around 10 per cent of Türkiye's electricity.

Officials say Türkiye needs at least eight additional reactors, plus 5 GW of small modular reactors (SMRs) to enhance energy security and ensure an affordable electricity supply. The country aims to reach 7.2 GW of nuclear generating capacity by 2035 and 20 GW by 2050.



Zimbabwe has agreed a \$455 million, 15-year concession deal with the Africa-focused unit of India's Jindal Steel for the refurbishment of a coal-fired power plant, the country's Energy Minister said.

The work on six ageing units at the Hwange thermal power station, representing 920 MW of capacity, is expected to take four years. Jindal Africa will recover its investment from revenue generated by electricity sales from the plant.

The 1520 MW Hwange plant, the

country's largest, was upgraded in 2023 with the commissioning of two units representing 600 MW. But its older units are operating at a third of their capacity due to breakdowns.

The Kariba hydropower station, built in the 1960s, completed a 300 MW upgrade in 2018 boosting its capacity to 1050 MW. However, in recent years its generation capacity has been affected by drought.

Zimbabwe only meets half of its 2 GW peak electricity demand and experiences frequent power cuts.

## MENA 'needs better grid' to cope with surging electricity consumption

The Middle East and North Africa (MENA) region needs to diversify its power supplies and improve grid infrastructure to satisfy fast-growing electricity consumption, according to a new International Energy Agency (IEA) report.

'The Future of Electricity in the Middle East and North Africa' report finds that electricity demand in the re-

gion tripled between 2000 and 2024 as populations and incomes rose. Based on today's policies, it projects MENA's electricity consumption to rise by another 50 per cent by 2035 – adding the equivalent of the current demand of Germany and Spain combined.

With a climate characterised by extreme heat and water scarcity, the largest portion (40 per cent) of the pro-

jected increase in electricity demand over the next decade is set to come from cooling and desalination, followed by urbanisation, industrialisation, the electrification of transport and the expansion of digital infrastructure.

Power sector investment in the region reached \$44 billion in 2024 and is projected to rise 50 per cent by 2035. Nearly half of this spending is set to go

towards grids. The report finds that grid modernisation, as well as expanding regional interconnections, will be critical to underpin electricity security in MENA economies.

Natural gas and oil dominate the region's current electricity mix, accounting for over 90 per cent of total generation, but many countries are pursuing policies to reduce the role

that oil plays in their power systems, freeing it up for higher-value uses or export.

Meanwhile, solar PV capacity is on course to increase ten-fold by 2035, pushing the share of renewables in MENA's electricity generation to around 25 per cent. And nuclear power is poised to expand strongly, with capacity set to triple.

## Uranium shortfall threatens nuclear energy revival

A renaissance for nuclear energy threatens to create a shortfall in the supply of uranium unless producers can find new sources, according to a report from the World Nuclear Association.

Global uranium requirements for reactors are set to rise by one-third to 86 000 tonnes by 2030, and to 150 000 t

by 2040, while output from today's mines is expected to halve between 2030 and 2040.

The report calls on the industry to secure investment to locate more uranium and extract it from current and new mines to avoid a supply crunch, the FT reports. "As existing mines face

a depletion of resources in the next decade, the need for new primary uranium supply becomes even more pressing," the report warns. "Considerable exploration, innovative mining techniques, efficient permitting and timely investment will be required."

Establishing new uranium mines to

feed the growing demand is a complex and lengthy process. It can take 10-20 years from the discovery of uranium to a mine beginning production.

The report also calls on the industry to invest in the complex conversion and enrichment processes that turn uranium into reactor fuel.

Jacques Peythieu, a Senior Executive Vice-President at French uranium producer Orano, said the west could break its dependence on Russian enrichment by the "early 2030s."

Russia is a major uranium enrichment provider, which has been a problem since the outbreak of the Ukraine war.

# Ørsted to sell shares at discount in attempt to shore up finances

Photo by Kenneth Dahl

- Discounted shares to raise DKK60 billion
- Funds will cover negative impacts of US anti-renewables stance, and ensure appropriate capitalisation to 2027

## Junior Isles

Danish offshore wind developer Ørsted said it plans to sell new shares at a 67 per cent discount in its DKK60 billion (\$9.4 billion) rights issue, in a move to shore up its finances after its plans for project development in the US were impacted by the Trump administration's aggressive stance against offshore wind. The subscription period opened on September 19 and closes on October 2.

Proceeds from the rights issue will be used to cover the additional funding requirement to complete its 924 MW Sunrise Wind project off the coast of New York, after it was unable to sell a stake in the project against the backdrop of US President Donald Trump's hostility to the industry.

Since the developer was unable to secure a partial divestment of Sunrise Wind and the associated project financing, as per its usual business model, Ørsted needs to fund the construction

of the entire project on its own balance sheet, which requires an incremental funding of approximately DKK 40 billion, according to the developer.

The remaining net proceeds of approximately DKK 20 billion will be used to strengthen the company's capital structure and enhance financial flexibility, helping ensure appropriate capitalisation for 2025 to 2027, the period during which Ørsted plans to deliver its 8.1 GW offshore wind construction portfolio. This includes

helping to cover the impact of the stop-work order on Revolution Wind or other risks that may materialise.

The company's Chief Financial Officer, Trond Westlie, said the funding should "create a robust financial foundation" for Ørsted to realise the potential of its business.

Ørsted, the world's largest offshore wind developer has been struggling with rising costs over the past few years. Its prospectus warned that difficult macroeconomic conditions,

supply chain challenges, as well as regulatory challenges in the US, might continue to negatively impact Ørsted in the future.

At the start of September Norwegian oil and gas group Equinor said it is injecting almost \$1 billion of fresh capital into Ørsted and planned to maintain its 10 per cent stake in the company. Equinor is Ørsted's second-largest shareholder behind the Danish government, which owns half of the company.

## European companies to get energy efficiency support

More than 350 000 companies across Europe are set to make energy efficiency gains through a €17.5 billion financing initiative by the European Union.

The energy efficiency for small and medium-sized enterprises (SMEs) initiative, led by the European Investment Bank (EIB) Group and supported by the European Commission, seeks to help SMEs using proven energy-saving technologies to lower energy bills and boost resilience and competitiveness.

The financing initiative will nearly double the current level of support during the 2025-2027 period. It will target energy efficiency and decarbonisation steps taken by SMEs and will use a combination of existing and new financial products, including debt and equity instruments.

The initiative aims to mobilise total investment of over €65 billion by 2027 for energy savings by SMEs, helping to close a market gap in Europe. The initiative was announced at a conference in Brussels last month.

"This is a significant step up in support to help companies cut energy costs," said EIB Group President Nadia Calviño. "And because SMEs are the backbone of the EU economy, this is also an important step in enhancing Europe's competitiveness."

Commissioner for Energy and Housing, Dan Jørgensen, said: "SMEs

are at the heart of Europe's economy and way of life. But they invest in energy efficiency at only half the rate of larger companies.

"This EIB initiative supported by the Commission will be key to close the investment gap, simplify access to financing, and accelerate the deployment of energy efficiency solutions. With more energy-efficient SMEs, we boost our economy, we benefit our climate, and we keep a healthy heartbeat in communities across Europe."

To streamline access and support for businesses, the initiative will introduce a "one-stop-shop for energy efficiency for SMEs". This is a single-entry point that integrates the full EIB Group intermediated lending offering, simplifying engagement and accelerating implementation.

Under the new initiative, the EIB Group will back dedicated investment platforms working alongside private sector partners, specifically targeting SME energy efficiency projects. Beyond financing new concrete projects, these platforms will broaden the investor base and attract crucial capital into Europe's energy efficiency ecosystem.

The EIB Group is partnering with the Solar Impulse Foundation, a non-profit organisation, to promote a model known as "servitisation" or energy efficiency as a service.

First announced at the United

Nations Climate Change conference COP29, this approach involves companies shifting from selling physical products to delivering outcomes. For example, instead of purchasing energy efficient heating or lighting equipment, SMEs pay for the warmth or light they use. The service provider retains ownership of the equipment and ensures its performance. This model eliminates upfront investment costs for businesses, making it easier and faster to adopt energy efficiency measures.

"Energy efficiency is Europe's most powerful and undervalued resource," said Bertrand Piccard, initiator and chairman of the Solar Impulse Foundation. "Every kilowatt-hour spared is money earned and emissions avoided. The Solar Impulse Foundation has already identified over 1600 profitable solutions that prove efficiency is not a cost but a gain. With this initiative, we can now bring these innovations to hundreds of thousands of SMEs across Europe, boosting their resilience, competitiveness, and ultimately the EU's industrial leadership."

The Commission also launched a dedicated working group under the European Energy Efficiency Financing Coalition, focused on SMEs and mid-caps, with the aim of addressing barriers and developing financing solutions adapted to the needs of small businesses across Europe.

## US private capital group targets Germany

US private capital group Apollo Global Management is entering a joint venture with the German power utility RWE as part of a wider European investment drive.

RWE said it would receive €3.2 billion upfront from Apollo as part of a deal to jointly hold its 25 per cent stake in German transmission system operator (TSO) Amprion.

The deal, expected to close in the fourth quarter of this year pending regulatory approval, will see RWE and Apollo share dividends paid out by Amprion. RWE will retain operational control of the joint venture.

The funds, which will be invested over time with the aim of financing future growth at Amprion, comes as Germany conducts an overhaul of its grid amid the shift to renewable energy.

RWE said the deal would give it the necessary capital to "support Amprion's major investment programme over the next decade". It added that Amprion, which had revenues of €5.6 billion last year and adjusted profits of €390 million, was an "attractive

investment with reliable and stable returns".

Apollo said this year that it could invest as much as \$100 billion in Germany over the next decade as American investors eyed Europe. Earlier this year, Apollo President Jim Zelter said the investment group had about \$100 billion of its roughly \$800 billion in assets under management in Europe, but planned to increase that figure.

Many investors are seeking to rebalance portfolios away from the US amid concerns about the country's growth outlook and policy instability under the Trump presidency, although Apollo has been investing in Europe for 25 years.

Zelter said on an earnings call in August that Apollo saw substantial opportunities as Europe committed to infrastructure investments, defence, re-industrialisation and power generation ventures.

In June Apollo agreed to provide £4.5 billion in debt financing to EDF to build the UK's Hinkley Point C nuclear power station, one of the largest infrastructure projects in Europe.



Photo by Ingo Joseph

## Siemens Energy invests €220 million in German transformer factory

Siemens Energy is investing approximately €220 million to expand its transformer factory in Nuremberg, Germany, creating 350 new jobs.

With this investment, Siemens Energy is responding to the sharp increase

in global demand for large power transformers, which are crucial for grid expansion.

Currently, Siemens Energy employs nearly 1000 people at the factory in Nuremberg, where transformers have

been manufactured since 1912. Due to rising demand, the facility will be expanded by around 16 000 m<sup>2</sup>, increasing production capacity by approximately 50 per cent.

Construction will take place while

operations at the factory continue, with the new production areas expected to be available by 2028. The Free State of Bavaria is supporting the expansion with up to €20 million in technology funding – aiming to sustainably

strengthen Nuremberg as a hub for innovation, research, and development.

Last year, Siemens Energy announced a €90 million investment at the same site for a new converter production facility.

## Tenders, Bids & Contracts

### Americas

#### 112 MW Ecuador order for Nordex

Nordex has won its first order in Ecuador for 19 N149/5.X turbines for a wind farm located in the southern part of the country. The Delta4000 turbines will be installed on tubular steel towers with a hub height of 105 m. The installation of the first turbine is scheduled for October 2026, with commissioning planned for March 2027.

The names of the customer and the wind farm have not been disclosed.

The wind farm will particularly support Ecuador's energy supply during the Amazon dry season and help reduce the risk of blackouts.

#### Siemens to work on Caribbean connection

Caribbean Transmission Development Company (CTDC) and Siemens Energy will collaborate on the Hostos Interconnection Project, which includes a submarine interconnection between Puerto Rico and the Dominican Republic.

The project will enable 700 MW to be supplied to Puerto Rico on completion in 2031. In the second phase of the project, the project will be able to transmit energy in both directions.

The project includes 146 km of submarine HVDC cable, AC/DC converters at coastal entry and exit points on both islands, a new 700 MW combined cycle power plant in the Dominican Republic, and a transmission line from the plant to the coast. Commercial operation is scheduled for January 1, 2031, making it the first two-way energy link in the Caribbean.

Siemens Energy will focus on the power generation and conversion solutions.

#### Renewable hybrid project in Chile for GES

Global Energy Services (GES) has won a contract for the construction of a hybrid project in Chile. The 695 MW project involves three technologies: solar PV, wind, and battery energy storage system (BESS). GES will be responsible for the engineering, construction, and commissioning of the project.

In addition to its scale, the project will function as a test for advanced operating models, optimising the interaction of the BESS with the grid and generation parks.

#### Wärtsilä engines for Nebraska power plant

Wärtsilä will supply twelve 50DF dual-fuel engines for a new 217 MW power plant in Nebraska, USA. The contract was awarded by Nebraska Public Power District (NPPD).

The plant will be located near Hallam, Nebraska, and the dual-fuel engines will run primarily on natural gas, but can switch to diesel if there are interruptions in natural gas supply.

The engines are scheduled for delivery in August 2027, and commercial operations should commence in 2028. The technology will allow for the possible integration of renewable energy to the system.

### Asia-Pacific

#### Formosa 4 to have Siemens Gamesa turbines

Synera Renewable Energy (SRE) has selected Siemens Gamesa to supply thirty-five 14 MW turbines for the 495 MW Formosa 4 offshore wind

farm to be built off the coast of Miaoli county in Taiwan.

The turbines will be provided by Siemens Gamesa's industrial nacelle factory in Taichung, Taiwan. The wind turbine foundations will be supplied by the local manufacturer Century Wind Power.

Cadeler is responsible for the transportation and installation of the turbines under a contract signed with the developer in August 2025. The inter-array cables will be installed by Seaway7, with offshore work expected to begin in 2028.

#### Mitsubishi to supply O Mon 4 power plant

Mitsubishi Power has been awarded a contract in cooperation with Doosan Enerbility Co. to supply two advanced M701JAC gas turbines and auxiliary equipment for the 1155 MW O Mon 4 combined cycle power plant.

O Mon 4 is being developed by the Vietnam National Industry-Energy Group (Petrovietnam), with the engineering, procurement and construction contract awarded to a consortium of Doosan Enerbility of South Korea and Vietnam's Power Engineering Consulting Joint Stock Company 2.

The plant, scheduled for completion in 2028, will have a combined cycle efficiency in excess of 64 per cent.

#### Contract awarded for 2.8 GW Taiwan plant

A full turnkey contract for a 2.8 GW combined cycle gas turbine (CCGT) power plant for the Tung Hsiao Power Plant owned by Taiwan Power Company in Tung Hsiao, Miaoli County, Taiwan, 130 m southwest of Taipei, has been awarded to Mitsubishi Power. The project will be executed jointly with CTCI Corporation.

The plant will consist of five M501JAC gas turbines. The total contract value is approximately €4.44 billion. The five units are scheduled to start operation sequentially from 2030 to 2031.

Mitsubishi Power will supply the gas turbines, steam turbines, and auxiliary equipment, while CTCI will be responsible for construction and balance-of-plant. The generators will be supplied by Mitsubishi Generators.

#### Adani Power to develop 2400 MW coal plant

Adani Power has secured a €2.5 billion contract to develop a 2400 MW greenfield coal fired power plant at Pirpainsi in Bhagalpur district, Bihar, India.

The contract includes a 25-year PPA with Bihar State Power Generation Company, and the plant will consist of three 800 MW ultra-supercritical units.

### Europe

#### Nordex receives orders for 39 wind turbines

UKA has awarded a contract for 20 Nordex wind turbines for the 140 MW Papenburg onshore wind farm at the Mercedes-Benz automobile testing site in Lower Saxony. The concrete foundations and concrete parts for the hybrid towers, with a hub height of 164 m, will be supplied by Max Bögl Wind.

The first turbines are scheduled to start operation by early 2027. Once fully commissioned, the wind farm will cover about 20 per cent of the annual electricity needs of the Mercedes-Benz Group in Germany. The electricity supply contract is for 25 years from the start of delivery.

In addition, Nordex has received an order for 71 MW in Portugal. This consists of 12 N163/5.X turbines with a total capacity of 70.8 MW. The contract also includes a 35-year service agreement for maintenance of the turbines. Turbine deliveries are scheduled to begin in mid-2026. The names of the customer and the wind farm have not been disclosed.

Nordex has also won an order from KELAG Kärntner Elektrizitäts Aktiengesellschaft in Austria for the 47.6 MW Lavamünd wind farm. Nordex Group will supply and install seven N163/6.X wind turbines, along with a 20-year turbine service contract.

First construction of the project is scheduled to start at the end of 2025, with commissioning of the wind turbines planned for 2027.

#### Biggest battery order for Rolls-Royce

Lithuanian energy supplier Ignitis has selected Rolls-Royce to supply large-scale battery storage systems from the mtu EnergyPack brand. The order comprises of systems with a total storage capacity of 582 MWh and a total output of 291 MW, which will contribute to the power grid in Lithuania from 2027 onwards.

The battery storage systems will be installed at three locations, including the Kelmė and Mažeikiai wind farms and the Kruonis pumped storage power plant.

Andreas Görtz, President of Sustainable and Mobile Power Solutions at Rolls-Royce Power Systems, said: "An important component of the Rolls-Royce solution is the mtu EnergetIQ Manager. This intelligent control system not only manages the three battery parks, but also the connected wind farms and controls both power supply and storage."

#### Agreement for 2 GWh BESS in Italy

Zelestra and BKW have signed a long-term agreement for the delivery of a 2 GWh battery energy storage system (BESS) project in northern Italy. As part of the agreement, Zelestra will allocate a share of the plant's generation capacity to BKW.

Construction on the project is scheduled to start in 2027, and it is expected to be fully operational in 2028.

#### Framatome wins Kozloduy nuclear contract

Framatome has won a contract to maintain and modernise the electrical systems at the two VVER-1000 reactors at Kozloduy nuclear power plant in Bulgaria. Framatome will upgrade the no-break power supply systems with new components.

This contract is part of the lifetime extension of the existing reactors and plays a key role in ensuring security of supply of low-carbon electricity for Bulgaria.

Kozloduy is Bulgaria's only nuclear power plant, providing over a third of the annual national electricity production.

#### Siemens Energy to build converter stations

The transmission system operators (TSOs) Energinet and 50Hertz, have placed a joint order with Siemens Energy for the construction and turnkey delivery of four converter stations and other technical components that will connect the Bornholm Energy Island project to the mainland grids

of Denmark and Germany.

The major contract covers the design, completion, transport, installation, testing, and commissioning of the systems by the mid-2030s.

Two converter stations and the HVAC station will be located at Aakirkeby on Bornholm, while the other stations will be built at Lindenhøj on Zealand and in the Kemnitz municipality in the district of Vorpommern-Greifswald in Germany.

The power hub on Bornholm will take electricity from the future offshore wind farms off the coast, raise it to a DC voltage level of 525 kV, and then make it available to consumers in Germany and Denmark as needed via submarine and onshore cables.

The power cable between Bornholm and the future substation near Lubmin on the shore of the Bay of Greifswald will have a capacity of 2 GW, while the power cable to Zealand will have 1.2 GW.

#### GE Vernova to modernise Dublin Bay plant

Electricity Supply Board (ESB) of Ireland and GE Vernova have signed a contract for the life extension and modernisation of the Dublin Bay power plant to enhance performance and reliability, and increase output. The life extension project is expected to be completed in 2026.

The Dublin Bay facility currently generates up to 415 MW using a single-shaft GT26 gas turbine. The life extension project will add up to 30 MW, increase efficiency by 1.8 per cent, improve grid stability, and lower carbon intensity.

### International

#### Everlence to supply Mauritania DF engines

Everlence has won a contract from China National Electric Engineering Co to supply four high-efficiency dual fuel 18V51/60DF engines for a new power plant in Nouakchott, capital of Mauritania. The plant will have a total output of 74 MW.

Each engine will deliver 18.5 MW, and commissioning is planned to be completed by late 2026.

The plant will be operated by Somelec, Mauritania's national utility, which plans to build additional facilities to gradually meet the country's growing power demand.

The dual-fuel engines can seamlessly switch between fuels ensuring reliable power-generation at all times.

#### JV to build solar production in Egypt

A joint venture consisting of TEDA-Egypt, Global South Utilities (GSU) of the UAE, AH Industrial Management of Egypt, and Atom Solar Egypt is to build an industrial complex to produce solar cells, panels, and energy storage systems in the Suez Canal Economic Zone in Egypt.

The industrial complex will be built on a 200 000 m<sup>2</sup> area in the Sokhna industrial zone. It will have a production capacity of 2 GW of solar cells, 2 GW of solar panels, and a 1 GWh energy storage systems factory.

The project will be implemented over three years, with a total investment of \$220 million. The output of the solar cell factory will be allocated for export to global markets, while solar panel factory's production will be directed to the local Egyptian market and regional markets in the Middle East and Africa.



## Hydrogen

# IEA forecasts robust hydrogen growth to 2030, despite delays

The early part of this decade saw considerable interest in building hydrogen into the energy mix and adapting it gradually as a replacement for fossil fuels. But the nascent industry has been hit with a number of delays and cancellations as the so-called “pipeline” for these projects has shrunk, according to a new report from the International Energy Agency (IEA). Despite this, the organisation sees robust growth for hydrogen between now and 2030.

Gary Lakes

The latest edition of the Paris-based International Energy Agency’s ‘Global Hydrogen Review’ reports that despite a series of project delays and cancellations, low-emissions hydrogen production remains on track for significant growth by 2030. The new energy sector continues to develop, the report said, but at a slower pace than the numerous announcements made earlier this decade had signalled.

Global hydrogen demand rose to nearly 100 million tons in 2024, an increase of 2 per cent over 2023. Most of this came from hydrogen produced from fossil fuels without measures in place to capture associated emissions. The largest consumers of this hydrogen were the traditional large users, oil refineries and other industries.

Producing hydrogen from fossil fuels remains far cheaper than low-emissions alternatives, the IEA report pointed out. The cost gap has widened recently due to falling natural gas prices and higher electrolyser costs driven by

inflation and slower deployment. But the IEA projects that this gap will narrow by 2030 as technology costs fall, renewable energy expands, and new regulations take effect.

According to the report, the project pipeline has shrunk as high costs, uncertain demand, regulatory delays, and slow infrastructure rollout have tempered the pace of low-emissions hydrogen adoption. While a year ago, the IEA projected that low-emissions hydrogen production would reach 49 million tons per year by 2030, it has now reduced that projection to 37 million tons per year by the end of this decade.

The report points out that not all of the projects that have been announced will be realised, and therefore actual capacity will be lower. But it notes those projects that are operational, under construction, or fully financed, are expected to exceed four million tons per year by 2030, which is five times more than 2024 levels. Furthermore, another six million tons per year could come online if strong demand creation policies are implemented.

“Investor interest in hydrogen jumped at the start of this decade thanks to its potential to help countries deliver on their energy goals,” IEA Executive Director Fatih Birol said in the report.

“The latest data indicates that the growth of new hydrogen technologies is under pressure due to economic headwinds and policy uncertainty, but we still see strong signs that their development is moving ahead globally,” Birol said. “To help growth continue, policy makers should maintain support schemes, use the tools they have to foster demand, and expedite the development of necessary infrastructure,” he added.

Meanwhile, the IEA pointed to developments in China, which accounts for 65 per cent of global installed or committed electrolyser capacity and nearly 60 per cent of manufacturing capacity. But, with more than 20 GW of annual manufacturing capacity – far above current demand – Chinese producers may face future challenges. Outside China, manufacturers are under pressure from rising costs and

slower uptake.

The report also finds that installing Chinese-made electrolysers abroad offers no significant cost advantage once transport and tariffs are factored in. The cost of making and installing an electrolyser outside of China in 2024 was \$2000-2600/kW, compared with \$600-1200/kW for electrolysers manufactured and installed in China, the IEA report said.

The cost of equipment is just part of the total investment needed to install an electrolyser, according to the report, which said that more than half of the total corresponds to engineering, procurement, construction and contingency costs, and these factors depend on the project location. When transport costs and tariffs are also considered, the cost of installing a Chinese electrolyser outside China is \$1500-\$2400/kW – narrowing the gap with non-Chinese competitors.

Barriers preventing the use of Chinese electrolysers outside of China remain, but this may change soon, according to the report. While installing electrolysers made in China can reduce

upfront investment, they face efficiency and under-performance issues and need to be adapted to local standards. However, Chinese manufacturers are now addressing many of these barriers through innovation and exploring the expansion of manufacturing operations overseas.

The IEA also pointed to Southeast Asia as a promising emerging hydrogen market. Announced projects could lift production from 3000 tons per year today to 430 000 tons by 2030. Achieving this will require faster renewable energy deployment, targeted policy support, and more pilot projects to build expertise.

The review highlights the shipping industry’s potential to adopt hydrogen-based fuels, provided compatible technologies are deployed and ports are upgraded. Nearly 80 ports worldwide already have strong chemical handling expertise, positioning them well to manage hydrogen fuels. Many are located near low-emissions hydrogen production sites, offering early adoption opportunities, said the IEA report.

## Gas

# Iraq’s energy export ambitions include plans for Oman

Iraq, OPEC’s second-largest oil producer, is embarking on an ambitious energy transformation that aims to expand its natural gas production, modernise infrastructure, and diversify crude export routes. At the heart of this strategy are multi-billion dollar gas projects designed to reduce flaring, boost domestic power generation, and attract foreign investment – paired with a landmark plan to build a crude oil pipeline to Oman, opening new horizons for export security and market access.

Gary Lakes

The centrepiece of Iraq’s gas strategy is the Gas Growth Integrated Project (GGIP), a sweeping initiative involving the Basra Oil Company, TotalEnergies, and QatarEnergy. The GGIP targets four interconnected areas: natural gas, solar energy, oil production, and water management.

QatarEnergy said in a statement issued last month during a contract signing ceremony that the contracts for the projects would require investments of over \$13 billion. Some initial work is underway, but the next phases are scheduled to begin in 2026.

The GGIP includes the redevelopment of the Ratawi oil field, with a two-phase plan to raise production from zero to 120 000 barrels/day by early 2026, and then to 210 000 barrels/day by 2028. Crucially, the second phase will eliminate routine flaring at Ratawi, a major environmental milestone.

The Gas Midstream Project will process all associated gas from Ratawi and capture flared gas from other fields,

producing enough fuel to power 1.5 million homes. A dedicated facility will handle 50 million cubic feet (mcf) of gas per day starting in 2026, reducing Iraq’s reliance on imported gas and cutting greenhouse emissions.

For decades, second only to Russia, Iraq has flared vast quantities of associated gas due to insufficient processing capacity, wasting a valuable resource and contributing to global carbon emissions. Chronic gas shortages create perpetual power outages in Iraq, especially during periods of high temperatures. The plan to cut Iraq’s flaring has been on the board for several years, now it appears that projects designed to capture and use the gas for domestic power generation are taking shape. The GGIP directly addresses the flaring challenge, aligning with Iraq’s commitments to environmental protection and sustainable development.

By capturing and processing gas that would otherwise be burned off, Iraq can feed its domestic power plants, reduce costly imports from neighbouring countries, and create new industrial opportunities. Unable to process

its gas output and supply power generation plants with gas supply, Iraq has relied heavily on neighbouring Iran for gas imports – a situation that has brought pressure on Baghdad from the US, which has imposed energy export sanctions on Iran.

According to data from *CEO World* magazine, as of 2025, Iraq holds an estimated 111.522 bcf (3.61 billion m<sup>3</sup>) of proven natural gas reserves. This gives it a global ranking of 12th in total gas reserves, about 1.61 per cent of global total.

One of the flagship components of this huge undertaking is the Common Seawater Supply Project (CSSP), which will construct a massive seawater treatment facility near Um Qasr. This plant will deliver up to five million barrels of treated seawater per day to southern oil fields, enabling enhanced oil recovery while conserving Iraq’s scarce freshwater resources, most of which come from the Tigris and Euphrates Rivers. The CSSP will produce up to five million barrels per day of treated seawater.

The integration of solar energy into

the GGIP further signals a gradual diversification of Iraq’s energy mix, even as hydrocarbons remain the backbone of its economy. While some renewable energy systems might make inroads in Iraq in the years ahead, Iraq intends for oil to play its traditional role as the country’s key to wealth and development. But continuing to flare gas as oil production increases would make no sense on a number of levels, especially economically and environmentally.

Iraqi Prime Minister Mohammed Shia al-Sudani has repeatedly stressed that Iraq’s 150 billion barrels of proven oil reserves and century-long production potential justify a higher OPEC export quota. The GGIP, along with other infrastructure projects, is part of a broader push to increase output capacity to meet both domestic needs and global demand.

While the country’s gas projects focus on domestic energy security and environmental gains, the country is also taking steps to safeguard its crude oil exports. Currently, almost all Iraqi crude is shipped from the southern port of Basra through the Gulf and the

Strait of Hormuz – a vital but vulnerable chokepoint subject to geopolitical tensions.

To reduce this dependency, Iraq and Oman have agreed in principle to develop a Basra to Oman crude oil pipeline. The proposed route could be overland – potentially passing through Kuwait and Saudi Arabia – or subsea across the Gulf, depending on the outcome of feasibility studies.

The first phase of the agreement involves building a 10 million barrel storage facility at Ras Markaz, near Duqm on Oman’s Arabian Sea coast. This location offers direct access to the Indian Ocean, bypassing the Strait of Hormuz and providing a safer, more flexible export route to Asian, African, and European markets.

Until the pipeline is operational, Iraq plans to ship crude by tanker to Ras Markaz, ensuring the storage tanks are consistently supplied. Oman’s OQ Group, through its subsidiaries, will partner with Iraq’s State Oil Marketing Organization (SOMO) to develop the storage project and jointly market Iraqi crude internationally.

# Transforming the energy sector

Without urgent action to modernise, expand and scale grid infrastructure, including addressing shortages of critical components like transformers, the world will not only fail to meet its increasing energy demands it will also be unable to undergo a successful energy transition. **Junior Isles** speaks to Hitachi Energy's Bruno Melles to get his perspective on the situation around transformers and how the company plans to address the challenges.

The energy industry is certainly far more interesting to the general public today than, say, 20 years ago. With climate change and the resulting ongoing transition to clean, sustainable energy sources, the sector has captured the world's attention as never before.

"Everyone realises that the energy transition to an electrified world is the only option if we really are serious about decarbonising," Bruno Melles, Managing Director of Hitachi Energy's Transformers Business Unit is convinced that shifting from a society that depends on fossil fuels for energy production to one where electricity represents the bulk of the world's energy production and consumption is the only way to achieve the carbon reduction goals needed to save the planet.

But that planet-saving energy transition is no small task. Indeed, there are several challenges, which according to Melles must be addressed at the same time.

The shift calls for huge investment in power generating capacity – predominantly wind, solar, hydro and

nuclear. The second challenge, he says, surrounds mobility. With increasing population and urbanisation, large cities are in the middle of extensive planning to ensure efficient and decarbonised forms of transport such as rail, metro and electric vehicles. The third, said Melles, is digitalisation.

"On top of moving to energy from fossil to electricity and placing a massive focus on alternative forms of energy production – in particular renewables and nuclear – as well as the mobility aspect, there is of course all the elements connected to the digitalisation and the artificial intelligence challenges that require even more investment."

He added: "So, all of these require faster and more widespread modernisation of the grid, as well as scalability of the grid because energy consumption will also increase. This is not just a challenge for Hitachi Energy, it's a challenge for everyone – entities in power generation, entities involved in transmission and distribution, users and all throughout the value chain."

Several metrics can be used to measure the size and scale of the challenge. According to Hitachi Energy, during the period to 2050, 80 per cent of the global energy consumed will come from electricity. "This is a 4x acceleration compared to where we are today," said Melles. Another indicator is the amount of investment that every utility, developer, power generation company is making. "We're talking about tens and tens of billions," said Melles. Other simple metrics include, for example, those connected to the data centre market being driven by the growth of AI. Melles explained. "According to the International Energy Agency, global data centre electricity use could reach 945 terrawatt-hours by 2030, equivalent to the total annual consumption of Japan or Germany."

The challenges and drivers will obviously differ from region to region. Europe is making massive investments in renewables such as offshore wind and is therefore building strong interconnections, including HVDC links between countries, to make grids more resilient. There is also

need for massive investment for grid modernisation, especially for distribution networks. "So, Europe is more about renewables interconnection and transmission and distribution networks," noted Melles.

In North America the drivers are different. "The US is far less connected from state to state, and there is a very important race to modernise a very aging network," said Melles. "The challenge in the US is how they are going to add more power generation to feed the massive demand that is coming from data centres and increased manufacturing."

India, he says, "is in the process of a major energy investment wave" that is linked to: power generation, including more hydro; the need for more transmission; and the development of a more efficient mobility network, i.e. a train system across the different states.

"The [various] challenges," said Melles, "are related to the level of maturity – the level of maturity of the power generation piece, the level of maturity of the transmission network, and then how you are going to ensure decarbonisation."

But perhaps one of the biggest challenges to the entire transition is the transmission system.

"One of the two biggest bottlenecks today is the availability of gas turbines needed to create the inertia needed in the system, but the other big bottleneck is in transformers, particularly [large] power transmission transformers," said Melles. "And this where I am happy because Hitachi Energy is the market and technology leader in the transformer space. We have announced major investments globally, have a broad footprint and a large amount of service centres."

Melles said: "Since 2020, Hitachi Energy has announced a total \$9 billion investment, which includes manufacturing capacity expansion, R&D, engineering, and partnerships. For transformers specifically, we announced a \$1.5 billion investment to increase the footprint and manufacturing. And on top of that, we announced a further \$250 million in our insulation and components business."

Those investments are spread across

the globe. A large part is in the Americas, where \$1 billion has been announced in the US alone, with major investments in Canada and Latin America. Other significant investments have been announced in Europe – Sweden, Finland, Spain, Germany and Switzerland. In addition, there is significant investment going into Türkiye. Looking to Asia, Hitachi Energy has announced investments in Thailand, Vietnam, as well as major investments in China and India.

"All those investments are going to serve domestic markets and also export markets because part of the key principle that we adopted in transformers is what we call flexible sourcing," explained Melles. "We want to give our partners the ability to rely on supply from multiple factories. This brings flexibility and resilience to the supply chain."

Another element that Melles says is an integral part of its investment is related to the fact that the transformer business of Hitachi Energy is vertically integrated.

"This means that all the components that are used in a transformer are manufactured internally. Starting from tanks, going to insulation material, bushings, tap-changers; our operation actually supplies those components to third-party partners. In a way they are our competitors but are an integral part of the transformer eco-system, so we are glad to support the market and our competitors who in this case are partners on the component side.

"So, in a nutshell it is quite a spread of investment and follows the very strong vertical integration that we want to drive in the business unit because that also supports the growth of the industry."

The transformer market is growing in all areas, in terms of deployment in various industry sectors, transformer type and geography. Although the market might be growing at different speeds in different countries, the entire transformer market is growing at pace.

"The first wave of growth in the market has been triggered by distribution and data centres – almost globally," said Melles. "But now I can say

**Melles: "... the energy transition to an electrified world is the only option if we really are serious about decarbonising."**





**Hitachi Energy's factory in Chongqing, China. Since 2020, the company has announced a total \$9 billion investment globally, which includes manufacturing**

that, basically, every part of the market is growing at very high speed. In terms of industries, there are some important sectors – like data centres, semiconductors and steel manufacturing – that are growing rapidly.

“In the utility space, transmission is growing very, very fast, probably faster than distribution right now. But it is a matter of sequence of investment flow.

“Overall, the utilities are investing because: the energy produced has to be transmitted and distributed; there is massive investment in the power generation space, e.g. in gas in North America; there is massive investment in offshore wind in Europe; and hydro is coming back strongly in countries like Canada, China and India. Rail and metro are also growing at very high speed.”

With such strong growth, one big

question is how to speed up transformer delivery. It is one that Melles has recently been discussing with customers. He stressed that Hitachi Energy, like any of its competitors, cannot simply react to requests.

“The times of customers calling for equipment and getting a response [that aligns with their schedules] are gone. Today, in the transformer market, we are in a world where proper planning is fundamental,” stressed Melles.

The company is investing in capacity to reduce lead time. Last month Hitachi Energy announced a historic investment of more than \$1 billion to expand the production of critical electrical grid infrastructure in the US. These investments, among the largest seen in the electrical industry in the country, include approximately \$457 million for a new large power

transformer factory in South Boston, Virginia, along with significant expansions of existing facilities throughout the country.

The South Boston facility will be the largest manufacturing site for large power transformers in the country and will produce transformers of up to 500 kV and 500 MVA. It is significant in that, as well as supporting efforts to improve grid resilience in the US, it will be located in a state that boasts the largest number of data centres in the country.

“It is the largest transformer investment seen in the US for a very long time. It will have all the latest technologies we have introduced in terms of manufacturing, engineering, assembly, quality control and health and safety,” said Melles. “We are very proud to work with the governor because we also need to attract people to the factory so the federal and state [governments] will support that by building houses for the workers. This is a very important step as we are going to create around 800 new jobs.”

Governor Glenn Youngkin added: “Eight-hundred and twenty-five new jobs will be transformational for Southside Virginia, as will the power transformers those new hires are set to build. We are also proud to announce a major workforce housing project to support Hitachi's new employees. We are partnering with Halifax County and Virginia Housing to build 96 new homes supported by a grant from the Virginia Workforce Housing Investment Program.”

Commenting on the social impact of the new factory, Melles said: “There will be 800 people, so that means 800 families which means a lot of young kids that will need schools and support. So, I am very happy that we can work with the community to help us support our new employees and colleagues.”

He stressed that working with universities and vocational schools is important to Hitachi Energy in attracting and retaining both white collar and blue collar talent, and is a central part of the company's driving ethos.

“It is also important to underline that this is a critical element in order to support the growth plans and investments that we are making,” said Melles. “This is why we are very proud that Hitachi Energy is attracting a lot of talent. Our purpose to

‘Inspire the next era of sustainable energy’ is really a catalyst for resources across the world.”

It is expected that the first transformer from the factory in South Boston will be used at a utility substation or for a data centre. “These are the applications that are very thirsty for this kind of product,” Melles noted.

The South Boston news follows an announcement in March of additional major investments of more than \$250 million by 2027 to expand global production of critical components for transformers. These investments bolster Hitachi Energy's manufacturing capabilities across the US, enhancing production capacity at the company's transformer factories in Virginia, Missouri, and Mississippi. It includes transformer components such as bushings and insulation as Hitachi Energy is a critical supplier to other transformer manufacturers.

Meanwhile, in June Hitachi Energy announced that it is strengthening its power transformer manufacturing operations in Türkiye to meet the growing demand for sustainable, high-quality energy infrastructure across Türkiye, Europe, and Asia.

This significant expansion is essential to meet the ever-growing customer demand and delivery lead times while maintaining superior quality. The new state-of-the-art 45 000 m<sup>2</sup> factory in Dilovasi will help boost manufacturing capacity by 70 per cent and create 30 per cent more jobs in the region.

In addition to expanding manufacturing, Hitachi Energy has also been changing how it works with its customers. The majority of its customers are now seen as partners, supported by long-term framework agreements. He notes that the whole industry is increasingly moving to such agreements, which require mid- to long-term visibility of a customer's project pipeline.

“For the last few years in most industry sectors, we have been working side-by-side with them – not only to co-create in terms of technology but also to work on a much longer pipeline to understand the volumes needed over a longer period,” explained Melles. “Having visibility over, say, a three to 10-year period allows us to deliver equipment when they need it. It also allows us to have proper planning for manufacturing, so we can design a factory to properly support

**The South Boston facility will be the largest manufacturing site for large power transformers in the US**





**Attracting and retaining both white collar and blue collar talent is key to the Hitachi Energy ethos**

our partner and also engage our suppliers on their raw materials and semi-finished goods we need to support operation. Having visibility on manufacturing also allows us to engage, within the frame agreement, our own suppliers or machinery that we need for the factory.”

In line with this approach, Hitachi Energy recently announced that it is also investing heavily in manufacturing for full integration on the component side – bushings, tap-changers and insulation.

Innovation in transformer design, development and production are also supporting speed of delivery as well as reducing environmental impact. As Melles put it: “Technology is the core of how we design, engineer, produce and manage the lifetime of the transformer.”

He says the company is embedding artificial intelligence and digitalisation as much as possible in its equipment, as well as focusing on how it standardises and modularises its manufacturing. “In this way, we can be faster and have much simpler

engineering,” said Melles. Changes are also being made to components like bushings and tap-changers, where modular design allows for flexible customisation and faster delivery.

Another important aspect from a technology perspective is connected to the circularity and decarbonisation of the portfolio. This has seen Hitachi Energy engaging the supplier on getting more traceability of green material, i.e. green copper and green steel. It is also introducing ester oils as alternatives to mineral oil in its transformers. These are not only biodegradable but are also less flammable. Similarly, it is working with a start-up company to find alternatives to using epoxy for insulation.

Melles added: “Let’s also not forget that we are decarbonising our operations, so the technology is also applied to the kind of equipment we use in our factories in order to ensure we meet our decarbonisation targets for 2030 and 2050. Let’s not forget that roughly 90 per cent of the transformer can be recycled. The question is how we work together with our supplier and

our customer and partner on how we can recycle when the transformer is at the end of life; or how we can leverage our service operation to extend the transformer life for a few more years.”

Importantly, these changes to the transformer and its components can be handled in existing factories and production lines. It is no surprise then that the large majority of investments that Hitachi Energy is making is to boost and accelerate production from brownfield sites. Unlike the new greenfield factory in Virginia, which is scheduled to produce its first transformers in the first quarter of 2029, brownfield facilities can be expanded in a couple of years.

Melles explained: “The biggest challenge when you are building a greenfield facility is the civil work; but when you have an expansion, the amount of civil work is very limited. This is why when we have a brownfield [site], basically we can say that, depending on the complexity, we will be ready to produce in one and a half to two years.”

He added: “If it’s a greenfield factory for producing distribution transformers, you can build it in two years but when you are building a factory for very large transformers, where you need big cranes, strong foundations and a lot of machinery, the time [to build] is more in the ballpark of three and a half to four years.”

Looking forward at the potential for new factories around the world, Melles says that with the current market evolution, agreements and commitments, and visibility that Hitachi Energy has for its partners, there is already sufficient investment to meet demand through to the early 2030s. The company is, however, already looking beyond this timeframe.

“We have already been speaking with a European customer about what might be needed between 2032-2040,” said Melles. “Particularly in the transmission utility space, there is already the visibility of the investment plan. I’m pretty positive that within the next two or three years we are going to collect

enough information to understand where else the investment is going to materialise. Right now, it’s a bit too early to say because we are investing in every region, so we need to ensure that the capacity is going to come.”

In the meantime, servicing the existing fleet will continue to be an important part of the picture. Earlier this year, Hitachi Energy announced that the company will strengthen its service capabilities and portfolio by creating of a dedicated service business unit, where it will consolidate its service offering from the different parts of the company.

“It will be a very important growth engine but will also be a very important part of our value proposition to support partners. There are three elements that our partners are looking for. The first is how to prolong the life of the existing assets to optimise its usage. Secondly, the large majority that we are selling are assets that we can digitise. So, the customers are asking how we can help them digitise those assets to help them take preventive actions through preventive maintenance, preventive support, etc. Then the third element is, what else can we supply to our partners as part of the service – transformers as a service, energy as a service and so on. There are many elements of the service value in digitalisation,” said Melles.

“We will offer a single face for the whole Hitachi Energy portfolio, and hopefully be the partner of choice for our customer – not only to support daily service activities but also to optimise the asset, digitise the asset and then to provide even more services that the customer is going to look for.”

Melles sees these as “super exciting” times for the energy transition and Hitachi Energy. He concluded: “Hitachi is Energy is not only technology leader but is also market leader. We are the largest supplier of transformers and high voltage equipment and systems in the world, and we appreciate the loyalty and confidence that our customers and partners are showing us.”



**A 765 kV ester-filled transformer: Hitachi Energy is introducing ester oils as alternatives to mineral oil in its transformers to support the circularity and decarbonisation of its portfolio**

# Brazil's green pivot: ambition meets reality

With surging renewables growth and strategic incentives, Brazil offers a compelling, if complex, landscape for climate finance and green infrastructure. This is the latest in a series of country analyses, where *TEI Times* looks at Brazil's generation and consumption profiles, policy, emissions targets and potential for a future increase in foreign participation in domestic decarbonisation projects.

**B**razil's energy transition is gaining global attention as it prepares to host the global climate negotiations in 2025 (COP30), balancing its role as both a major emitter and a clean energy leader. The government has set bold climate targets and launched investment-friendly policies, yet foreign investor confidence remains tempered by regulatory volatility and economic risks.

#### Decarbonisation commitments

Brazil has a distinctive position in a decarbonising world for at least three reasons. Brazil plays a crucial role in absorbing and storing CO<sub>2</sub>, as the largest Amazonian country. It is a large greenhouse gas emitter, with a 4.3 per cent global share according to the Climate Change Tracker, with as much as 75 per cent of the total emanating from agricultural and land-use activities – in most large emitting countries it comes from energy. Last, but not least, the share of clean energy as a percentage of electricity output is amongst the highest in the world.

The administration of President Lula da Silva, in power since early 2023, released updated emissions targets in late 2024. The nation is targeting to cut greenhouse gas emissions by between 59 and 67 per cent below the 2005 levels by 2035 and reach carbon neutrality by 2050. The nation's efforts, however, score poorly. It ranks 28th in the Climate Change Performance Index, one of the medium-performing countries. The policies and actions in recent years are viewed as 'insufficient' by the Climate Action Tracker.

President Lula wants to improve its profile but has been facing many challenges, many historical in nature. Brazil has been reliant on fossil fuels and continues to support oil and gas investments. The government has to rebuild environmental policy, which was negatively impacted by policy rollbacks and budget reductions under the previous Jair Bolsonaro government. It needs to better execute the slowdown of deforestation which had surged under Bolsonaro.

#### Energy mix

Brazil accounts for about 1.8 per cent of global energy supply, based on statistics from Energy Institute. Fossil fuels accounted for more than two-thirds of energy supply and for about 48 per cent of primary energy consumption. Oil was the principal fossil

fuel, accounting for about 48 per cent of energy supply and 36 per cent of consumption. The reliance is because the Latin American giant is one of the top 10 oil producers in the world.

By comparison, fossil fuels occupy a tiny share of power generation in Brazil. About 90 per cent of electricity was sourced from clean energy sources. Hydroelectric power was responsible for 55.4 per cent of the total output 746 TWh in the country in 2024. Renewables, chiefly solar and wind, were responsible for 31.9 per cent, nuclear for 2.1 per cent and other clean sources for 0.4 per cent.

Wind power installed capacity witnessed a compound annual growth rate of 17.4 per cent in the 10 years to 2024, reaching 33 GW, according to IRENA. Solar capacity rose at an annual rate of 87 per cent, to 53.1 GW. Electricity output from wind and solar have been the fastest growing in the country, according to calculations based on data from Ember Research. Wind generation's annual growth rate was 20 per cent and solar was 87 per cent. Comparatively, the annual growth rate for the same period for nuclear was 0.8 per cent, and for hydroelectric power it was 1.6 per cent. The annual growth rate for coal and gas fired generation was negative 5.1 per cent.

#### Investment environment

With surging renewables growth and strategic incentives, Brazil offers a compelling, if complex, landscape for climate finance and green infrastructure. It offers a great number of climate business and investment opportunities. Its population size, low per capita electricity consumption, and the scope for industry electrification are some of the growth factors. Yet, the country's renewables investment profile for foreign investors currently should be viewed as medium to high risk.

The political environment has been volatile while policy and regulatory shifts have led to uncertainty and created a lack of long term visibility for investors. Some high profile past corruption scandals related to state-owned energy companies further raises investors' doubt. Further raising investment risk, the economy is expected to grow slowly, at 1.7 to 2.9 per cent, in the coming quarters, inflation may hover at about 5 per cent, and interest rates could stay at around 15 per cent, based on forecasts



Jacobelli: Brazil has a distinctive position in a decarbonising world

collated by Trading Economics. Importantly, long term sovereign rating also highlights risk. In early 2016 Moody's rating was adjusted from Baa3 (stable) lower medium grade to Ba2 (Negative) Non-investment grade Speculative, though it improved to Ba1 positive since late 2024.

The Brazilian government is not standing still. It is trying hard to attract investment in its energy transition. Media and research platform Green Central Banking examined Brazil's green finance efforts in late 2024. The organisation highlighted that in 2024 when it held the G20 presidency, the country had launched a G20 taskforce to broaden climate discussions across central banks, finance ministries and others. The central bank earned the highest green finance score by Green Central Banking of any non-European country. It underlines that Brazil's climate risk disclosures aligned to global standards and a developing currency hedge programme could reduce costs for foreign investors. It mentioned that the \$2 billion sovereign sustainable bond was a good start, albeit some experts were concerned the labelling was too broad.

#### Policies and incentives

Foreign investment policies have managed to attract foreign investors into the country despite the challenges and risks. Santander bank cites statistics from UNCTAD showing that Brazil was the fifth largest recipient of foreign direct investment in 2024 with inflows amounting to about \$66 billion. This translated into a total stock of foreign direct investments amounting to about \$997.5 billion.

Brazil has actively announced policies and incentives in favour of energy transition projects. There are tax relief measures for investors in approved infrastructure projects, including clean energy, typically for equipment purchases such as wind power equipment and components. In practice, companies do not have to pay federal taxes on such equipment which directly reduce project costs.

The country has also been supporting renewable energy through subsidies. For example, it spent about \$3.2 billion in subsidies for renewables in 2023 – an increase of 27 per cent over 2022, according to Argus Media. In August 2024, the country launched the National Energy Transition Policy (PNTE) focused on transitioning to a low-carbon economy. The initiative is aimed at mobilising about \$380 billion in energy transition related investments over the next decade. The projected amount is expected to come from both domestic investors as well as foreign. It is designed to be cross-sectoral and align with climate, fiscal and industrial policy.

#### Investment backdrop

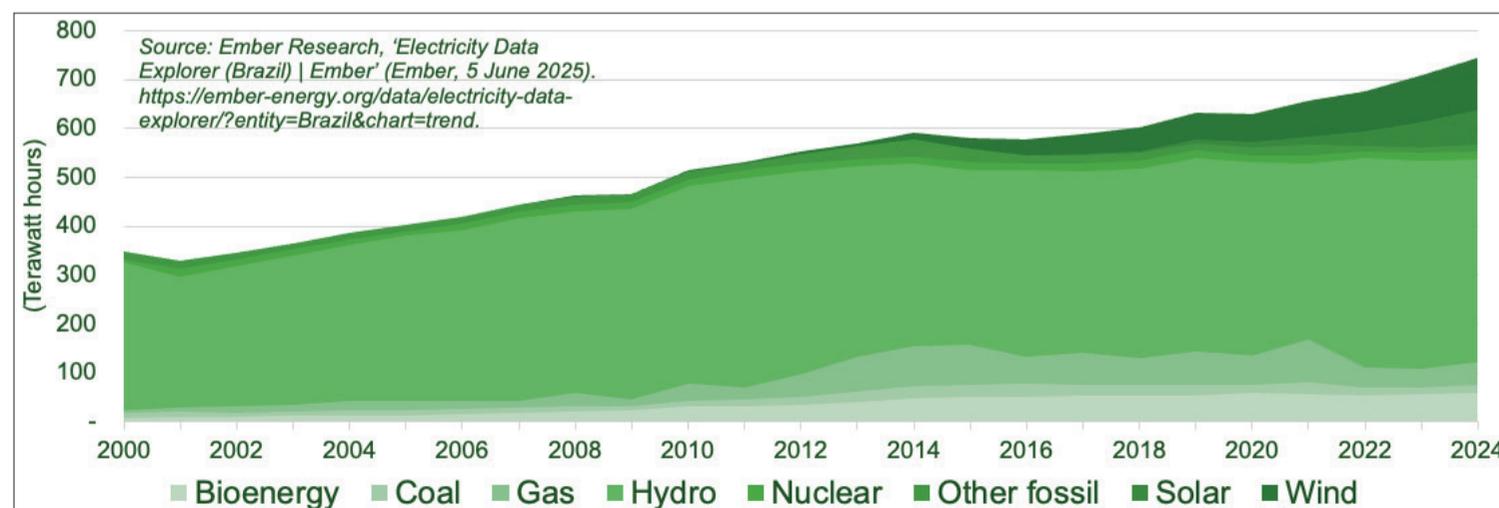
There are several examples of foreign investments in Brazil's energy transition, including from China, Europe and the US. Italy's Enel invested in the 716 MW Lagoa dos Ventos wind farm in 2021. France's Voltalia operates a 320 MW solar farm in the state of Rio Grande do Norte. Chinese engineering giant Power Construction Corp. of China (POWERCHINA) built a 425 MW solar complex in the state of Ceara. Amazon, Microsoft, and US tech giants are building data centres which will be powered by clean energy.

While these companies may not always directly invest in generation facilities, they can sign bankable corporate clean energy long-term power purchase agreements. In fact, some experts argue that Brazil's abundant clean energy supply, could lead to a boom in data centre construction.

Brazil's ambitious energy transition goals coupled with government incentives makes the country an interesting target for foreign investments. Should the country be able to build a relatively stable political and economic outlook, foreign investors interest will not lack.

Prepared for *The Energy Industry Times* by Joseph Jacobelli, Managing Partner, Asia Clean Tech Energy Investments Ltd.

Electricity generation in Brazil (2000-2024)



# CCUS: The decarbonisation tool heavy industry cannot do without

Decarbonising heavy industry and dispatchable power is one of the hardest but most essential steps toward net zero. Mitsubishi Heavy Industries' Professor Emmanouil Kakaras believes carbon capture, utilisation, and storage is the answer.

The global drive to reach net zero emissions cannot succeed without tackling the toughest part of the challenge: hard-to-abate sectors such as cement, steel, aluminium, refining, glass and chemicals. These industries are foundational to modern economies, indispensable to our continued progress towards a more sustainable energy future, yet their emissions are not easily addressed by electrification and clean fuels alone. The answer lies in carbon capture, utilisation, and storage (CCUS).

By 2040, CCUS could potentially capture a third of all industrial emissions. But to realise this opportunity, policymakers, investors and industry must work together to build an end-to-end carbon value chain – from capture to transport, storage, and ultimately utilisation. Done right, this can evolve into a holistic carbon ecosystem, where CO<sub>2</sub> is both managed as a waste product and recycled and transformed into a valuable feedstock for new products and fuels to the maximum possible extent.

According to the International Energy Agency, current global CO<sub>2</sub> capture capacity must increase 20-fold by 2030 to keep us on course for net zero. Even adjusting the model to discount entirely any CCUS-equipped power generation, the conclusion is undeniable: the pace of deployment must accelerate dramatically.

Today, fewer than 50 at-scale CCUS facilities operate worldwide, but more than 700 projects are in development. There is real opportunity here to address one of the trickiest problems standing in the way of the world's net zero ambitions, if only we are able to grasp it.

#### Where is CCUS essential?

Industrial process emissions are fundamentally different from those in power generation. For example:

■ **Cement:** Two-thirds of emissions stem from the chemical reaction of calcining limestone into lime. While efficiency improvements and alternative materials can reduce the footprint, CCUS is the only viable pathway to tackle these process emissions at scale.

■ **Steel:** Traditional blast furnaces release large volumes of CO<sub>2</sub>. While



Members of the project team from ArcelorMittal, D-CRBN and Mitsubishi Heavy Industries recently visiting the pilot plant in Gent, Belgium

hydrogen-based steelmaking is emerging, it will take time to scale. CCUS offers immediate emissions reductions.

■ **Refining:** Combustion and process emissions make these sectors difficult to decarbonise without CCUS.

For these, there is only one solution that is proven, scalable and economically viable: CCUS.

#### A proven technology

MHI's track record demonstrates what is possible. With over 30 years of experience, 18 commercial plants worldwide, and further projects under construction, MHI has deployed more capacity to capture CO<sub>2</sub> from flue gas than any other provider.

At Padeswood cement works in Flintshire, Wales, MHI is co-developing what will be the UK's first carbon capture plant at a cement production facility. The project is part of a comprehensive effort to decarbonise the UK's cement sector, aiming to store 800 000 tonnes of CO<sub>2</sub> per year.

This larger project, the Hynet Cluster, is an important demonstration of cooperation between government and industry accelerating the deployment of CCUS. Industrial clusters such as Hynet allow for economies of scale, where CO<sub>2</sub> from multiple emitters can be transported via shared pipelines to established storage locations. This ensures that early projects benefit from shared infrastructure, lowering the barriers to entry and encouraging investment.

In the steel sector, MHI is working with ArcelorMittal on a multi-year trial of carbon capture technology in Gent, Belgium to identify ways to enhance carbon capture and the use of CCUS technologies in steelmaking.

Alternatives, particularly hydrogen-fuelled reduction of iron ore, will have a significant role to play in the decarbonisation of steel in the long-term, but these will not be the only tools. Iron and steel production already account for about 7 per cent of global emissions, and demand for steel is set to grow by another 15 per cent between 2021 and 2050.

The industry should be exploring ways to scale up and employ clean hydrogen, and MHI itself is part of this effort through Primetals Technologies, but we must recognise the need to decarbonise an expanding industry urgently. For that, CCUS provides an answer.

#### The CO<sub>2</sub> value chain

The technical argument for the rapid deployment of CCUS across hard-to-abate sectors like cement, steel and refining is clear and MHI is already demonstrating workable solutions. To unlock the economic case, the goal of these efforts must be directed toward creating an end-to-end value chain for CO<sub>2</sub> that can advance its commercial viability.

The most important condition for establishing the complete CO<sub>2</sub> value chain is the creation of a functional CO<sub>2</sub> transport and storage infrastructure. Wherever there is a clear path towards permanent CO<sub>2</sub> storage opportunities, carbon capture solutions are rolling out to link CO<sub>2</sub> emitters with permanent storage sites. At the same time, CO<sub>2</sub> utilisation technologies are deploying to take advantage of these carbon feedstocks, offering in some cases a viable alternative to permanent CO<sub>2</sub> storage.

MHI's partnerships with companies like Infinium, D-CRBN and Cemvita are already exploring how captured CO<sub>2</sub> can be turned into fuels and chemicals. Digital platforms such as CO<sub>2</sub>NNEX, developed by MHI and IBM, are providing transparency across the value chain, tracing CO<sub>2</sub> from capture through transport and storage.

Ultimately, enhanced CO<sub>2</sub> recycling could create a circular carbon economy, where carbon becomes a traded commodity rather than a liability, but government support is vital. The EU's Net-Zero Industry Act, which targets 50 Mt of CO<sub>2</sub> storage capacity by 2030, is a step in the right direction. Incentives such as grants, tax credits, and carbon pricing mechanisms must complement industrial cooperation and private investment.

Commercial viability depends on recognising the cost of inaction: if it

remains free to emit, CCUS will always look expensive. Carbon pricing, grants, and offtake contracts can correct this imbalance, ensuring CCUS competes fairly against unabated operations.

#### The case for dispatchable power

There is a case to apply this same pragmatic approach to power generation. The electrification of transport, heating, and industry – alongside the rapid rise of AI and digitalisation – is driving demand to unprecedented levels. System operators face record peaks and increasing risks to reliability. Renewables remain central to the transition, especially in the long-term, but firm, dispatchable low-carbon power is equally essential.

CCUS applied to gas turbines provides a part of that solution. It offers baseload and flexible generation that is low-carbon and capital efficient. In Japan, MHI is demonstrating this at the Himeji No.2 power plant, capturing CO<sub>2</sub> from a utility gas turbine and offering a direct model for utility applications. In the UK, the government's CCS infrastructure funding has brought the Peterhead Carbon Capture Power Station closer to investment decision, showing how policy support can unlock commercial deployment.

Importantly, the build-out of transport and storage infrastructure for industrial CCUS also reduces barriers for power sector adoption. This creates synergies that lower system-wide costs and make CCUS a multi-sector enabler.

#### Conclusion

Decarbonising heavy industry and dispatchable power is one of the hardest but most essential steps toward net zero. CCUS is proven, available, and ready to scale. It may not be the only solution tomorrow, but today it is one of the few viable options. MHI's global projects – from cement in Wales to steel in Belgium and gas turbines in Japan, the US and in Europe – show that this pathway is not theory but practice.

CCUS is the technology that makes net zero in heavy industry achievable. Now is the time to seize the opportunity and scale.

Professor Kakaras says now is the time to seize the opportunity and scale





Junior Isles

# Vive la Révolution!

**D**anish wind power developer Ørsted must feel like it is in a civil war of sorts – fighting the onslaught against wind farms led by US President Donald Trump.

In August President Trump issued a Stop-Work Order, halting work on the 704 MW Revolution offshore wind farm in Rhode Island. Revolution Wind, a subsidiary of Ørsted and a 50/50 joint venture between Ørsted and Global Infrastructure Partners' Skyborn Renewables, is fully permitted and was 80 per cent complete at the time of the stop order. The project is slated for completion in 2026, at

which point it will deliver power to Connecticut and Rhode Island.

Construction on the Revolution wind farm started last year, following the final federal approval from The Bureau of Ocean Energy Management Offshore (BOEM). But in late August it issued the stop-work order, citing the need “to address concerns related to the protection of national security interests”.

To have a project upended at such an advanced stage is almost unthinkable. Reacting to the order, which saw Ørsted's share price plummet to a record low, the Revolution Wind joint

venture filed a complaint in the US District Court for the District of Columbia on September 4. The states of Connecticut and Rhode Island also initiated legal action against the stop-work order the same day. The attorneys general for Connecticut and Rhode Island filed an injunction on the basis that the Trump administration “arbitrarily reversed course and issued a Stop Work Order without explanation... despite the States' and others' deep reliance interests”.

The coordinated rebellion might have paid off. On September 22<sup>nd</sup>, the US District Court for the District of Columbia granted the preliminary injunction, allowing Revolution Wind to restart impacted activities while the lawsuit challenging the stop-work order progresses.

Making the ruling, Judge Royce Lamberth, US District Court for the District of Columbia said: “Revolution Wind has demonstrated likelihood of success on the merits of its underlying claims. It is likely to suffer irreparable harm in the absence of an injunction... maintaining the *status quo* by granting the injunction is in the public interest.” He added: “If Revolution Wind cannot meet benchmark deadlines, the entire project could collapse... There is no doubt in my mind of irreparable harm to the plaintiffs.”

Ørsted said it will “resume impacted construction work as soon as possible, with safety as the top priority” and added that it will “continue to seek to work collaboratively with the US administration and other stakeholders toward a prompt resolution”.

Although it is the first time a project has been halted at such an advanced stage, the move by the Trump administration is not the first and will no doubt not be the last.

In April, the BOEM paused and then later approved Equinor's \$5 billion Empire Wind project, which was at an earlier stage of construction than Revolution Wind. And in mid-September, the US Department of the Interior (DOI) filed a motion in the US District Court in Maryland to remand and/or vacate a permit for US Wind's proposed \$6 billion, 1.7 GW project off Ocean City, Maryland, thus further escalating the legal and political fight over offshore energy.

Commenting on the court filing, Nancy Sopko, US Wind VP of External Affairs, said the company “remains committed” to building the project.

“After many years of analysis, several federal agencies issued final permits to the project. We intend to vigorously defend those permits in federal court, and we are confident that the court will uphold their validity and prevent any adverse action against them,” she said.

Using energy as a political football is always a dangerous game. One senior executive recently told the *FT's Energy Source* that even the oil industry is quietly concerned about the ferocity of the Trump administration's war on offshore wind, stressing that persistent attacks raised the issue of “sovereign risk” for all foreign investors, not only renewable energy companies.

The executive, who wished to remain anonymous, said: “The concern is that halting projects that are fully permitted could provide a future Democratic administration with a playbook to go after oil and gas projects in a similar fashion.”

Following the stop-work order on the Revolution Wind project, Jason Grumet, Chief Executive of lobby group American Clean Power Association, said: “The unfortunate message to investors is clear: the US is no longer a reliable place for long-term energy investments.”

The ultimate outcomes of Revolution, Ocean City, and other cases that are sure to follow, will no doubt dissuade clean energy companies from investing in the US. This could subsequently see the country lose ground in the clean tech race.

In late September, the US Department of Energy announced that it intends to cancel more than \$13 billion in funds that the Biden administration had pledged to subsidise wind, solar, batteries and electric vehicles.

The announcement prompted sharp criticism from California Governor Gavin Newsom, who said the US was ceding leadership on clean energy to China. California, the most populous US state, has among the most ambitious clean energy and greenhouse gas emissions reduction goals in the world.

“[China's] President Xi, I don't know what else he's got to applaud... I think he's going to give Trump a bear hug when he arrives,” Newsom said during NYC Climate Week in late September.

Nevertheless, the Trump administration appears to be unquestioningly backing its President. US Interior Secretary Doug Burgum said at a press conference on September 10<sup>th</sup> that offshore wind has no future in the US under the Trump administration and that the government was reviewing five offshore wind projects that are now under construction.

Speaking to the press at Gastech in Milan, Italy, Burgum said offshore wind was “too expensive and not reliable enough”. He said: “Many of those projects weren't really about electricity, they were about tax subsidies. I think the fact that the subsidies have been either cut back or limited, means that it is likely that there will not be future offshore wind built in America.”

Burgum added that there is also opposition to offshore wind due to concerns about the whale population, as well as concerns from the Department of Defense (DOD) and the Federal Aviation Administration (FAA) about interference with radar systems.

Meanwhile, in an interview with the *FT*, Energy Secretary Chris Wright said approvals for offshore wind farms were rushed through and there are legitimate and serious concerns that are being looked at by multiple government departments. “We are taking the subject seriously but offshore wind... the long-term path for it is a train wreck and that is not a path the United States wants to go down.”

Trump said in a social media post last month: “Amazing phenomenon – Any Country that relies on Windmills is DEAD. Their Energy Costs have gone through the roof, and their populations are angry. Windmills aren't only killing the birds, they're ‘killing’ lots of bad politicians who are losing their jobs because of them!”

His posts may carry some weight at home but are unlikely to have much influence beyond domestic waters. What seems to be a single-minded, and irrationally intense vendetta against wind, may see Trump win isolated domestic battles but it will not see him win the wider war. The global renewables revolution is here to stay.

