

# THE ENERGY INDUSTRY TIMES

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Ursula von der Leyen says REPowerEU will help accelerate the phase-out of fossil fuels and launch investments on a new scale

## REPowerEU details plan to cut Russian energy dependence

The European Commission's detailed plan to reduce dependence on Russian fossil fuel will accelerate renewables, hydrogen production and drive energy efficiency. However, it is likely to extend coal use, potentially jeopardising climate targets. **Junior Isles**

The European Commission has published its detailed plan to wean itself off Russian fossil fuels in light of Russia's invasion of Ukraine and subsequent move to cut energy supplies to a growing number of European states. The REPowerEU plan, however, has come under fire from some environmental activists, as the strategy will likely extend the use of coal.

The strategy will see the EU spend an additional €210 billion (\$220.87 billion) by 2027, in order to increase the share of renewables, diversify its energy suppliers in the short term and

promote energy efficiency to cut energy dependence on Russia. The combination of measures aims to eliminate all Russian energy supplies by 2027.

At the heart of the strategy is the plan to use over half (€113 billion) of the additional spend on renewables to increase their share from the 40 per cent currently set for 2030 to 45 per cent. This translates into 1236 GW of clean energy by 2030 compared to the 1067 GW initially proposed in the 'Fit for 55' package. At the same time money will be allocated to a Hydrogen

Accelerator, which sets out a strategy to double the previous EU renewable hydrogen target to 10 million tons of annual domestic production, plus an additional 10 million tons of annual hydrogen imports. This move to produce hydrogen to replace natural gas, coal and oil in hard-to-decarbonise industries and transport sectors will call for €27 billion of direct investment in electrolyzers and distribution of hydrogen in the EU.

Announcing the strategy, Commission President Ursula von der Leyen, said: "REPowerEU will help us save

more energy, accelerate the phase-out of fossil fuels and launch investments on a new scale," adding that it will accelerate the transition to clean energy.

In this new reality, the Commission said gas consumption in the EU would reduce at a faster pace, limiting the role of gas as a transitional fuel.

"In parallel, some of the existing coal capacities might also be used longer than initially expected, with a role for nuclear power and domestic gas resources too," the Commission said, estimating that the EU would use 5 per

*Continued on Page 2*

## EU steps up wind ambitions to ease reliance on Russia

Europe is betting heavily on wind and in particular offshore wind, with Belgium, Denmark, Germany, and the Netherlands announcing a joint offshore wind target of having at least 150 GW of generation capacity installed by 2050 to reduce their reliance on Russian gas. The announcement came as the EU launched its REPowerEU strategy to end the use of Russian fossil fuels well before 2030.

With their 150 GW pledge for 2050, the four EU member states have a joint target of half of the capacity aimed for the entire EU by that time under the EU Offshore Renewable Energy Strategy, issued in November 2020.

Just ahead of the agreement, Giles Dickson, WindEurope CEO, commented: "It's fantastic that the four EU North Sea Heads of Government and the European Commission President will come together in Denmark to make new commitments on offshore wind. And that they will do so the very day the EU launches its big REPowerEU action plan to transform Europe's energy system."

Notably the four countries stepped up their pledge to build up to four ar-

tificial islands in the North Sea where electricity from wind turbines could be either transmitted to shore or used to produce hydrogen that could also be transported to shore.

Belgium, Denmark, Germany, and the Netherlands now plan to quadruple offshore wind in the North Sea to 65 GW by the end of the decade.

Commenting on the plan, Belgian Energy Minister Tinne Van der Straeten, said: "Energy is today used as a weapon and our families and businesses are the victims. With this green acceleration we can replace gas and oil, especially from Russia, faster with wind at sea and green hydrogen."

The expansion will see the addition of a new artificial island, which would be built on the Danish side of Dogger Bank. The new "Brintø" project, proposed by Copenhagen Infrastructure Partners (CIP), will collect 10 GW of offshore energy and convert it into hydrogen.

Denmark is already developing an energy island called Vindø, which would produce 3 GW of power by 2033. The Danish government is the big shareholder in the project that is also backed by the Danish pension

funds PensionDanmark and PFA.

In addition to the Vindø and Brintø islands, Belgium and Germany are also studying whether to build energy islands in the North Sea.

Belgium said it "will establish the world's first offshore energy island", which will combine offshore wind and an international interconnector. The tender for the project is expected to be awarded by the end of the year. Meanwhile, in Germany an energy island feasibility study is being conducted by Allianz Investment Management and by CIP.

The countries will coordinate development of the energy islands and develop energy-sharing deals. In a joint statement, the countries said: "We will begin planning for multiple energy hubs and islands by undertaking a screening of the potential for offshore wind and, where relevant, green hydrogen production, in our entire North Sea territory."

The news came as Italy announced it was working on incentives for offshore wind projects to help achieve its climate goals and cut reliance on Russian gas.

Answering questions from members of Parliament, Italy's Energy

Transition Minister, Roberto Cingolani, said: "Incentive mechanisms are in the programming phase." Besides subsidies, Cingolani said offshore wind would also receive grants from Italy's national Recovery Fund plan.

Cingolani said last year more than 60 developers had expressed interest in building offshore wind farms. These include ERG, Eni, Saipem, EDF-owned Edison and Fincantieri.

According to WindEurope's recently published Finance and Investment Trends report investor confidence in wind energy remains high. Europe invested €41 billion in new wind farms in 2021, financing a record 25 GW of new capacity. The report warns, however, that investments are falling well short of the 35 GW a year of new wind the EU now needs to build to meet its 2030 climate and energy security targets.

■ Cumulative global capex spend in the offshore wind sector is expected to hit \$1 trillion by 2031, according to a new report by Wood Mackenzie. By 2030, Wood Mackenzie expects 24 countries to have large-scale offshore wind farms, up from nine today. Total installed capacity will reach 330 GW, up from 34 GW in 2020.

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cent more coal than previously expected over the next five to 10 years.

Coal is expected to produce another 100 TWh of power, about the annual electricity consumption of Belgium, during that period. Nuclear, which is low-carbon but unpopular with environmentalists because of the radioactive waste generated, is set to produce another 44 TWh annually.



**Timmermans admitted coal may have to be used "a bit longer"**

During a press conference, Frans Timmermans, the European Commission's Executive Vice President for the European Green Deal admitted that using less natural gas in a transitional phase would mean using "coal a bit longer", which "has a negative impact" on carbon emissions.

"But if at the same time, as we propose, you rapidly speed up the introduction of renewables – solar, wind, biomethane – you then have the opposite movement," he said. "If we can actually do what I say – reduce our energy consumption in combination with a speedier introduction of renewables – we will bring down our emissions even quicker than before," he said.

Officials maintained that the bloc would hit its target to cut emissions by 55 per cent of 1990 levels by 2030 but the strategy has drawn criticism from a number of environmental organisations.

The EU executive has opened the door for the financing required for the REPowerEU plan to be channeled through the Recovery and Resilience Plan, drawing on an estimated €225 billion in loans not yet used under this plan.

Green groups are, however, against the proposal to raise additional funding from the sale of €20 billion of surplus carbon emissions permits, which would allow the release of 250 million tonnes of CO<sub>2</sub> under the emissions trading scheme.

"The Commission's plan to accelerate the EU's shift to clean energy solutions such as energy efficiency, wind and solar power is very welcome," said Ester Asin, Director of the WWF European policy office. "But financing this by selling pollution permits is misguided, as is building more fossil gas infrastructure or relying on increased biomass use. That will just prolong our dependence on fossil fuel imports and jeopardise climate goals."

Eilidh Robb, an anti-fossil fuels campaigner at Friends of the Earth Europe, said: "These plans are supposed to fast-track the clean energy transition – but the European Commission's latest strategy gives with one hand and takes with the other."

"[The] so-called REPowerEU contains useful and necessary strides towards renewable solutions but it simultaneously enables almost 50 fossil fuel infrastructure projects and expansions."

# Record year for renewables as energy security drives momentum

New capacity for generating electricity from solar, wind and other renewables increased to a record level worldwide in 2021 and will grow further this year as governments increasingly seek to take advantage of renewables' energy security and climate benefits, says the International Energy Agency.

Junior Isles

According to the International Energy Agency's latest 'Renewable Energy Market Update', the world added a record 295 GW of new renewable power capacity in 2021, overcoming supply chain challenges, construction delays and high raw material prices.

Global capacity additions are expected to rise this year to 320 GW – matching the EU's total electricity generation from natural gas. Solar PV is on course to account for 60 per cent of global renewable power growth in 2022, followed by wind and hydropower.

"Energy market developments in recent months – especially in Europe – have proven once again the essential role of renewables in improving energy security, in addition to their well-established effectiveness at reducing

emissions," said IEA Executive Director Fatih Birol.

He added: "Cutting red tape, accelerating permitting and providing the right incentives for faster deployment of renewables are some of the most important actions governments can take to address today's energy security and market challenges, while keeping alive the possibility of reaching our international climate goals."

Based on today's policy settings, however, renewable power's global growth is set to lose momentum next year. In the absence of stronger policies, the amount of renewable power capacity added worldwide is expected to plateau in 2023, as continued progress for solar is offset by a 40 per cent decline in hydropower expansion and little change in wind additions.

While energy markets face a range of uncertainties, the strengthened

focus by governments on energy security and affordability – particularly in Europe – is building new momentum behind efforts to accelerate the deployment of energy efficiency solutions and renewable energy technologies. The outlook for renewables for 2023 and beyond will therefore depend to a large extent on whether new and stronger policies are introduced and implemented over the next six months.

The World Energy Council's 'World Energy Pulse', released in early May, has shown that attitudes towards energy security, energy affordability and sustainability, the core dimensions that define the World Energy Trilemma, have dramatically shifted since the start of the year and that tensions between them are growing.

As the energy sector continues to manage aftershocks from the impacts

of climate change, Covid-19 and the conflict in Ukraine, the World Energy Pulse revealed nearly half of the 700 respondents expect the convergence of these crises to accelerate the pace of the transition. The survey marks the first quantitative assessment of the conflict's impact on the global energy transition.

While investment in diversification of the energy mix is seen as a leading measure to address security and affordability concerns globally, industry leaders said they expect greater investment focused on onshore and offshore renewables in response to the crises. However, amidst a background of increasing energy security concerns, respondents underscored the continued importance of investment in hydrocarbons – marking a notable shift away from previous divestment trends.

## Countries take initiative in tackling volatile energy prices

In the absence of a unified response from the European Commission, Spain, Portugal and Greece have approved national plans aimed at curbing soaring energy costs.

In mid-May the Spanish government signed off on a temporary cap on natural gas prices that it said would immediately reduce the amount paid by a third of consumers and 70 per cent of industry. Portugal also approved the Iberian mechanism to limit the price of gas for electricity.

As energy prices surge across Europe, exacerbated by Russia's war in Ukraine, Spain and Portugal joined forces earlier this year to ask the European Union's executive arm to allow them to skirt around the EU's common-market rules.

The two countries said the mechanism would not affect prices elsewhere in the EU because the Iberian peninsula has limited energy interconnections with France and the rest of Europe.

Citing the large amounts of renewable energy used in both countries and their lack of connections with the European power grid, the European Commission agreed to allow a price cap on gas used for power generation, averaging around €50/MWh for the next 12 months, beginning with a cap of €40 per MWh.

Duarte Cordeiro, Portugal's Environment Minister, said the current reference price in the European wholesale market was about €90. "This will enable us to protect all consumers

exposed to the market," Cordeiro said. Spain and Portugal initially proposed a cap of €30 per MWh.

Spanish Minister for Ecological Transition Teresa Ribera said the measure would protect both consumers and businesses as Europe grapples with volatile energy prices that are driving record inflation.

"For the first time, it's not the usual people paying for this," Ribera said. "The measures adopted are fundamentally aimed at reducing the extraordinary profits of energy companies so that this adjustment benefits all of us."

Greece, meanwhile, has said electricity consumers will receive a refund of up to 60 per cent of all the surcharges they have paid from December to May, as part of a government relief package

aimed at easing rising utility bills.

Prime Minister Kyriakos Mitsotakis said soaring electricity costs forced the government to act alone because the EU has been too slow to offer a solution and a joint response to the problem.

"Regardless of European decisions, the Greek government, on its own initiative, will launch a system in July that will decouple international gas increases from the country's electricity bills. This scheme will operate for up to one year," Mitsotakis said, referring to the measures as an indirect cap to stabilise consumer bills.

In late April, Greek electricity providers began cutting off power to more than 26 000 households because they could no longer pay the bills. This has increased pressure on the government.

## Russia continues to cut energy supplies to neighbours

Finland has become the latest country to have its energy supplies cut from Russia. The move followed Finland's announcement that it plans to join NATO, following Russia's invasion of Ukraine.

On May 14, Inter RAO cut off electricity supplies to its Scandinavian neighbour through its subsidiary RAO Nordic Oy, citing "problems in receiving payments for electricity sold".

Finnish grid operator Fingrid said the issue was related to Western sanctions that affected payments, rather than being retaliation for any other action by Finland.

Fingrid, which said Moscow supplied about 10 per cent of Finland's needs, said it could replace Russian

supplies with Swedish power and by boosting domestic production. Fingrid said in April it had prepared for the prospect of Russia cutting electricity flows to Finland by restricting the transmission capacity by a third.

Russia also cut gas exports to the country after Finland refused to pay in rubles. Two thirds of the gas used in Finland comes from Russia but gas only accounts for about 5 per cent of its annual energy consumption.

Finnish energy provider Gasum, the Finnish government and gas consuming companies said they were prepared for a shutdown of Russian flows and that the country will manage without.

"The Finnish gas system is in balance both physically and commercially,"

Gasgrid Finland said.

Finland said it had agreed to charter a storage and regasification vessel from US-based Excelerate Energy (EE.N) to help replace Russian supplies, starting in the fourth quarter this year.

Tension between Finland and Russia had been escalating since the start of last month when Fennovoima cancelled its contract with Russia to build the Hanhikivi 1 nuclear power plant. The 1200 MW plant was expected to generate approximately 10 per cent of Finland's electricity needs.

The Finnish company terminated the engineering, procurement and construction (EPC) with RAOS Project due to significant delays and RAOS Project's inability to deliver

the project. Fennovoima said the war in Ukraine has worsened the project's risks and RAOS has been unable to mitigate any of the risks.

The Hanhikivi 1 project, of which Rosatom owns a 34 per cent stake with the remainder held by a Finnish consortium, had been delayed several times and the construction permit had not yet been granted.

"The decision to terminate the EPC contract with RAOS Project is not made lightly. In such a large project there are significant complexities and decisions are made only after thorough considerations. We fully acknowledge the negative impacts and do our best to mitigate those," said Esa Härmälä, Chairman of the Board.

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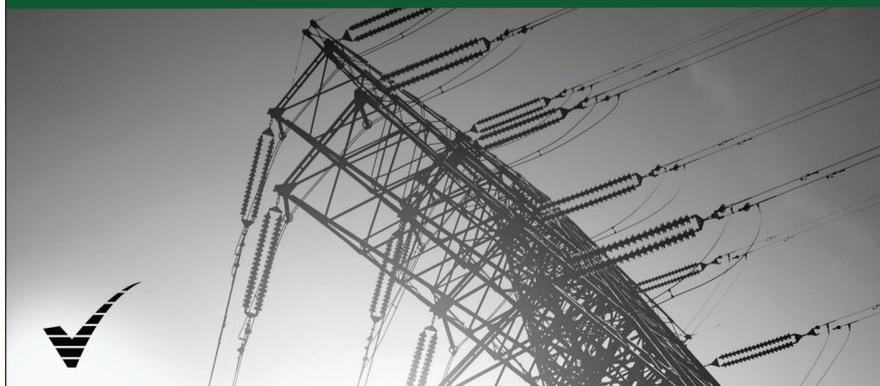
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# Offshore wind picks up pace in the US

- California pushes forward with ambitious plans
- North Carolina leases for TotalEnergies and Duke Energy

With the first offshore wind plants delivered in the US, now states are vying for investment in the next phase of projects.

California has had a longstanding interest in the technology and a new bill had directed that before mid-year the California Energy Commission (CEC) should make more firm plans. The CEC is required to "evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonisation benefits and shall establish megawatt offshore wind planning goals for 2030 and 2045".

Two other reports will feed in to the target and are due this year. One will assess the economic benefits of offshore wind, including workforce development needs. The second is a permitting roadmap with timeframes and milestones for a coordinated, comprehensive and efficient permitting process both for the wind farms and for the necessary connections.

Early reports suggest that California will look for 3 GW of offshore wind by 2030 and a further 10-15 GW by 2045. In addition, it suggests that new developments between now and that date "could support a faster rate of

offshore wind deployment that could potentially support a larger megawatt planning goal of up to 20 GW between 2045 and 2050".

The targets were described as "aggressive", given California has no offshore wind projects yet and auction of leases has yet to be scheduled.

The east coast is moving forward more quickly. Leases awarded on two sites offshore of North Carolina could result in about 1.3 GW of offshore wind. The award is a step in the administration's plan for deploying 30 GW of offshore wind capacity by 2030. It was the nation's first national goal for

the technology.

"The Biden-Harris administration is moving forward at the pace and scale necessary to help achieve the President's goals of making offshore wind a reality for the United States," said Secretary Deb Haaland.

The Carolina Long Bay auction, in the East Wilmington Wind Energy Area, offered two lease areas with similar acreage, distance from the coast and wind resource potential. They were won by TotalEnergies and Duke Energy. Before the leases are finalised, the Department of Justice and the Federal Trade Commission will conduct

an antitrust review of the auction

"This auction puts real dollars on the table to support the economic growth of offshore wind development – including the jobs that come with it," said Amanda Lefton, Director of the Bureau of Ocean Energy Management Director.

One of the bids won by TotalEnergies was \$160 million for a site 37 km from the coast that can house 1 GW. The project is expected to come online by 2030. The company was also recently awarded a lease to develop a 3 GW wind farm off the coast of New York and New Jersey.



## Colombia plans to take leading role in wind

Colombia's President Iván Duque and the country's Ministry of Mines and Energy have launched a roadmap for installation of onshore and offshore wind farms.

The first projects will be installed offshore of Barranquilla and the village of Galerazamba in Bolivar, to start up in 2026 and 2027, respectively. The offshore projects will have investment of almost \$1 billion and will be developed jointly with the World Bank and United Kingdom.

A Spanish firm will lead the Bolivar project, which will see installation of 35 wind turbines offshore.

President Duque predicted that Co-

lombia would become a regional reference in terms of clean energy generation, saying: "When the government began, we had an incipient 28 MW of installed capacity of non-conventional renewables. We are going to close this year with 2800 MW, but there are also 4500 MW that will be advanced in the next two years. So this puts Colombia at the forefront of the energy transition."

The government said that 16 other wind energy projects are being developed by the company BlueFloat and the government intends to open the bids for these projects during the current parliamentary term.

## Electrobras sell-off given the green light

Brazilian President Jair Bolsonaro has been given the go-ahead to reduce the government's stake in Latin America's largest power utility, from 72 per cent to 45 per cent.

A court ruled in favour of allowing the state to reduce its controlling stake in the publicly listed entity, which has a market value of \$13.5 billion. Ministers argued that putting Eletrobras in private control will enhance its ability to invest and lower bills.

The privatisation excludes subsidiaries Eletronuclear, which operates three nuclear plants in Brazil, and the Itaipu hydroelectric plant, in which the Paraguayan government also holds a stake.

Bolsonaro's main rival and front-

runner, Luiz Inácio Lula da Silva, recently cautioned prospective buyers against participating in the Eletrobras sale, sparking fears the privatisation could be reversed.

Augusto Neves dal Pozzo, an infrastructure lawyer, said: "Privatisation is always controversial in Brazil. The biggest risk for investors is certainly political." He warned that the process could face legal challenges.

Gabriel Dufflis Fernandes, research analyst at consultancy Wood Mackenzie, said: "If well managed in the future, the company can resume investments to maintain its important market share and generate good returns for shareholders."

## US acts to shore up grid reliability

- Federal government to underwrite transmission expansion, batteries
- California sets up strategic reserve

The US Department of Energy (DOE) has asked for public input on a \$2.5 billion Transmission Facilitation Programme (TFP). The new project is one of the first of over \$20 billion of investments under the DOE's new Building a Better Grid Initiative.

The TFP will provide financial support for large new transmission lines and upgrades to existing lines, as well as for the connection of microgrids in specific states and territories. The DOE said a reliable, resilient electric grid is critical to managing climate change impacts and achieving President Biden's goal of a clean power grid by 2035.

The DOE says independent estimates indicate that the US needs to expand the electricity transmission network by 60 per cent by 2030, and triple it by 2050 to carry more renewable generation to meet more electrified needs.

More than 70 per cent of the existing transmission lines and transformers are over 25 years old. Power outages from severe weather have doubled over the past two decades and

last year the frequency and length of power failures reached their highest levels since reliability tracking began in 2013. Customers on average experienced more than eight hours of outages in 2020.

To support the grid expansion, the DOE will commit to purchasing up to 50 per cent of the maximum capacity of the transmission line for up to 40 years, reducing the financial challenges that often face new transmission programmes or upgrades by encouraging and de-risking additional investment.

The DOE will continue buying capacity until customer demand has increased enough to cover those costs. Then it will re-market the capacity, thereby replenishing the fund. This was described as "an innovative approach that can spur valuable new lines that otherwise would not get built".

In the first phase, applicants are seeking capacity contracts for eligible projects that will begin operation no later than 31 December 2027. DOE expects to issue another request for

proposals in early 2023 that will incorporate the loan and public-private partnership financing tools in addition to the capacity contracts.

Alongside new transmission lines to carry power to where it is needed, DOE is investing in 'time-shifting' power supplies, with \$3.1 billion in funding to support the production of batteries and battery components, as well as \$60 million for electric vehicle second use.

In California, where grid operators have been criticised over rolling blackouts, the state's new solution is a \$5.2 billion "strategic electricity reliability reserve". The Reserve will help keep supplies reliable through expected drought, heatwaves and wildfires. It will comprise a mix of existing generation capacity that was scheduled to retire, new generation, new storage projects, clean backup generation projects, demand side capacity dispatchable by the grid operator, and diesel and natural gas backup. The Reserve will be capable of providing up to 5000 MW that will be available whenever the grid is stressed.

## Ecuador tempts 37 companies to join renewables tender

Ecuador has prompted an enthusiastic response to a tender process through which it will award concessions for 500 MW of new renewable energy capacity across the country. As many as 37 companies from 13 countries have signed up to take part in the tender.

Ecuador's ministry of energy and mining, which is running the tender, said it had interested companies from Argentina, Chile, China, Colombia,

South Korea, Ecuador, El Salvador, France, Spain, Honduras, Mexico, Panama and the Dominican Republic.

The tender procedure, locally known as Bloque ERNC, started in December 2021. The bidders will be competing for projects grouped in four sub-blocks, with 150 MW allocated for small-scale hydro, 200 MW for wind power, 120 MW for solar and 30 MW for biomass/biogas-based plants.

Projects with the lowest energy price will be selected until the capacity within each sub-block is completely absorbed.

In a revised timetable, technical offers will be opened in October and economic bids will be opened two months later. The process is set to be completed with contracts awarded in mid-January 2023, according to the new timetable.

# Southeast Asia must make clean transition to ensure energy security

- CO<sub>2</sub> emissions set to grow 35 per cent
- Fossil fuel-based generation remains high at nearly 70 per cent

Syed Ali

Southeast Asia's reliance on fossil fuels to meet rising demand for energy is proving to be a significant vulnerability in today's energy crisis, according to the International Energy Agency (IEA).

In its 'Southeast Asia Energy Outlook 2022' published last month, the Paris-based agency said the region must make major efforts – including from international financing – to boost energy efficiency, renewable power and low emissions fuels.

The 10 member economies of the

Association of Southeast Asian Nations (ASEAN) are among the world's fastest growing. Their accelerated transition to sustainable energy would not only cut carbon dioxide (CO<sub>2</sub>) emissions and fossil fuel imports, said the Outlook, but also speed up universal access to electricity and provide greater business opportunities in the emerging clean energy economy.

Southeast Asia is set to play a major role in global energy transitions as a key supplier of critical minerals and manufacturer of clean energy products.

Based on today's policy settings, energy demand in the region is set to

grow by around 3 per cent a year to 2030, with three-quarters of that increased demand being met by fossil fuels, according to the report.

As a result, Southeast Asia's CO<sub>2</sub> emissions would grow 35 per cent from 2020 levels. And without stronger policy action, said the IEA, its net oil import bill, which stood at \$50 billion in 2020, is set to multiply in size rapidly if today's high commodity prices endure.

"Southeast Asia is an emerging heavyweight of global energy, and the speed of its economic development makes it even more essential that the

region's governments hasten efforts to transition to sustainable energy and that they get the international support they need to do so," said IEA Executive Director Fatih Birol.

A separate report issued by S&P Global Ratings, however, said Asia-Pacific's energy transition will be an uphill journey. It warned that by global standards, the region faces considerable roadblocks as it moves to renewable and stable forms of energy.

The reliance on fossil fuel-based power generation remains high at nearly 70 per cent; and demand for power is growing, with significant

investment needs.

Over the next decade, the current disruption of global supply chains and sharp increases in energy prices will act as an incentive for a faster transition toward renewables, said S&P Global's 'Energy Transition: Asia-Pacific Faces An Uphill Climb To A Cleaner Future'. It notes that the importance of coal will decline but remain relevant in the generation mix unless greener technologies become a cheaper and equally stable form of power, or if financial aid from developed nations can help Asia-Pacific countries decarbonise faster.

## New Zealand eyes ban on fossil fired generation

New Zealand's government is preparing to consult on banning fossil fired power plants.

Further to banning new offshore oil and gas exploration in 2018, and committing to 100 per cent renewable electricity by 2030, the Ministry of Business, Innovation and Employment (MBIE) will next start consulting on a ban later this year. It plans to have it in place by 2024.

The ban is one of the energy-related initiatives the government unveiled last month in its Emissions Reduction Plan, which outlines how New Zealand will meet its emissions budgets.

While the plan includes a number of punitive measures, it also includes incentives. For example, the government is committing to putting more than \$650 million over four years towards various schemes aimed at decarbonising the energy system.

Funding will largely come from revenue generated from the Emissions Trading Scheme. Energy and Resources Minister Megan Woods said funding

would go towards big projects to decarbonise process heat.

"There will also be targeted investment at a regional level for projects that optimise low emission fuel use, funding for electricity transmission and distribution infrastructure upgrades to support fuel switching, and the early adoption of high decarbonisation energy technologies," she said.

Specifically, the government plans to provide rebates for businesses, including small businesses, farms and factories, to procure and install energy efficient electrical equipment. It hopes to do this between 2022 and 2028.

The government also revealed a new target in addition to what it described as its "aspirational" 100 per cent renewable electricity target. It committed to ensuring 50 per cent of the country's total energy consumption is from renewable sources by 2035.

Looking further ahead, it pledged to develop a mandatory energy and emissions reporting scheme for large energy users by 2024.



## New Australian government may look to accelerate end of fossil fuels

The Australian Greens, which could hold the balance of power in the country's upper house after the recent elections, have called for a halt to all new gas and coal projects. The Greens' stance will be met with resistance from elected Labor government puts it on a collision course with the country's large fossil fuel export industry.

At the time of writing, it was unclear whether Labor would have an outright majority in the lower house. If it does not reach the number of seats needed to govern on its own, the party will need to negotiate with the Greens or pro-climate independents on all non-bipartisan legislation.

Adam Bandt, the Greens' leader, said preventing all new coal and gas developments would be the party's priority in negotiations with Labor.

"The Greens will be demanding climate targets in line with the science for a safe climate, that meet our Paris commitment," he said. "But the first job is to stop making the problem worse. Labor's targets don't even take into account the 114 new coal and gas projects in the pipeline. You can't put out a fire while you're pouring petrol on it."

Anthony Albanese, who was sworn in as Prime Minister promised to

implement stronger climate policies than his predecessor Scott Morrison, including a more ambitious 2030 emissions reduction target and an emissions trading scheme, and to spend billions of dollars upgrading electricity infrastructure.

But he has said Labor, which gained ground in coal mining areas, would not stop Australia's large coal and gas export industry from developing more coal mines and gas fields.

Just ahead of the election, the government announced that it will invest A\$300 million (\$217 million) in a new hydrogen hub and several carbon capture storage (CCS) sites in Northern Territory (NT) aimed at decarbonising the oil and gas sector.

Meanwhile the country continues to make progress on existing plans to transition to a cleaning up its power sector.

Last month Spanish renewable energy firm Acciona Energia kicked-off construction works on the MacIntyre complex, a 1026 MW wind farm facility located in Queensland. The A\$2 billion (\$1.4 billion) wind complex comprises two wind farms, MacIntyre and Karara. MacIntyre will be Acciona Energia's largest wind farm in the world.

Both wind farms will be equipped with 180 Nordex Delta 4000 turbines and their construction works are expected to be completed by 2024.

Meanwhile, New South Wales advanced two major energy storage projects. The Department of Planning and Environment last month granted planning approval to Origin Energy for the 700 MW/2800 MWh battery project on the site of the 2.9 GW Eraring Power station, which is planned to close in August 2025.

Elsewhere in the state, plans were unveiled for the construction of an A\$1.6 billion (\$1.1 billion) solar-plus-storage project. The Merriwa Energy Hub, being developed by Maoneng will include a 550 MW solar farm and a 400 MW/1600 MWh battery energy storage system. Maoneng is due to submit a development application with the NSW Department of Planning, Industry and Environment. Financial close is expected by December 2023 with completion expected in 2025.

■ Sunshine Hydro, in partnership with Energy Estate, has unveiled plans for the construction of a A\$2.00 billion (\$1.44 billion) pumped hydropower and green hydrogen super-hybrid project in the Australian state of Queensland.

## South Korea looks offshore for clean energy

South Korean energy companies are increasingly seeing offshore wind as a key technology, as the country continues its clean energy transition.

In May, Posco Energy said it signed a deal with a Danish fund management firm focused on renewable energy infrastructure to work together on offshore wind power and green hydrogen.

The largest private energy producer in South Korea said it will cooperate with Copenhagen Infrastructure Partners (CIP) on the offshore wind power business; supply chain including steel products for offshore wind power; green hydrogen business; and run a joint working group.

"Through cooperation with CIP, we will have opportunities not just in Korea but also overseas in the offshore wind power business. We also expect to work together in the green hydrogen

business," said Posco Energy President Chung Ki-sup.

In a separate move, Korea Midland Power Co., Ltd. (KOMIPO) signed a Joint Development Agreement (JDA) with Asian renewable energy company Vena Energy, for the development of an offshore wind project near Yokji Island. The project is expected to have a capacity of 384 MW.

"With this partnership, Vena Energy and KOMIPO established a strong foundation to accelerate the energy transition in South Korea," said Kwangjin Cheong, the Head of Vena Energy Korea.

■ Korea Electric Power (KEPCO) is to sell all overseas coal fired power plants, including one in the Philippines, as part of efforts to improve its financial status over record quarterly losses.



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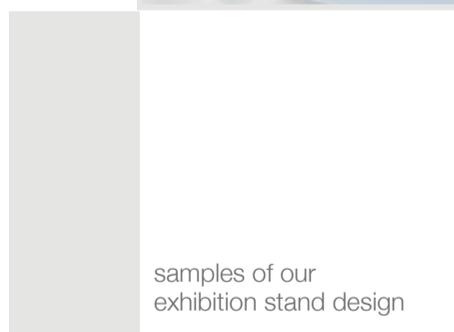
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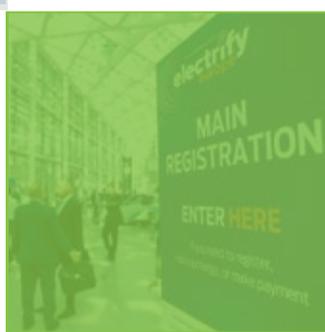


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# Huge development and scale-up interest in electrolysis industry

■ New developments claim 'world's largest' ■ New technologies still gaining government support

Janet Wood

Electrolysis developers are seeking a fast step-change in capacity as hydrogen becomes an increasingly important energy vector.

Twenty chief executives recently joined Thierry Breton, the EU's Commissioner for the Internal Market to try to pave the way for Europe's electrolyser manufacturing sector to produce 10 million t of hydrogen from renewables by 2030.

They said this would require a ramp up of electrolyser production to around 25 GW per year and an installed electrolyser capacity of 90-100 GW, which they described as "an unprecedented challenge and a significant industrial opportunity".

The group signed a Joint Declaration seeking a supportive regulatory framework, adequate access to finance and research and development

that would quickly develop the industry's supply chains.

Breton said: "With RePowerEU, we have just doubled our target for EU hydrogen production to 10 million tons by 2030. This will require large amounts of electrolysers for hydrogen production... The Commission is committed to support this important industrial upscaling with a number of supportive measures."

The electrolyser industry is experiencing a step change in capacities, as illustrated by a new order from H2 Energy Europe, which has taken on US-based Plug Power to supply electrolysers for a 1 GW offshore wind-to-hydrogen project in Denmark. According to Plug Power, this is the world's largest electrolyser order to date.

In Germany, RWE AG has received an €8 million funding commitment from the state of Lower Saxony to

build a 14 MW pilot electrolysis plant that is meant to pave the way for the power group's goal to have a 300 MW electrolyser facility at Lingen by 2026. RWE will invest €30 million in the project, which will see two electrolysis technologies tested at the site – a 10 MW pressure-alkaline electrolyser from Sunfire GmbH and a 4 MW proton exchange membrane electrolyser from Linde. The hydrogen will be fed into a public hydrogen network, blended with the fuel for gas turbines at RWE's Emsland power plant or used to supply the hydrogen-capable gas turbine that RWE and Kawasaki plan to build at the site by 2024.

In the UK, Swedish utility Vattenfall AB has been awarded €11 million in UK government funding to produce hydrogen at one of the turbines at its 97 MW Aberdeen Offshore Wind Farm. The 8 MW pilot project will see

an electrolyser integrated into an existing operational turbine. The hydrogen produced will be piped to the coast at Aberdeen Harbor.

Elsewhere, Scottish Power and Storegga have forged a partnership to develop, build and operate a series of green hydrogen production facilities in Scotland. Called Cromarty Hydrogen the first facility is expected to provide 20 t of green hydrogen per day, with operations slated to start in 2024. Subject to demand, the facility could also be expanded to 300 MW, according to Scottish Power.

The nascent industry is still seeing new technologies enter the field. A new 'Step Change Memorandum of Understanding', signed by green hydrogen start-up PlusZero and TTP, aims to deliver a new generation demonstrator electrolyser that addresses current scalability challenges.

David Amos, Managing Director at

PlusZero, said: "We believe it is not unrealistic to suggest that the UK Hydrogen Strategy target of 10 GW low carbon hydrogen production capacity by 2030 could be met by Scottish green hydrogen alone. However, limited green hydrogen production capacity has created a massive scalability challenge. We want to change that, and through this exciting partnership with TTP, we believe that we can."

Meanwhile Gravitricity and Arup secured UK government funding to study the feasibility of storing hydrogen in purpose-built underground shafts.

Gravitricity's Hydrogen and Thermal Storage Lead, Sally Molyneux said: "Storing hydrogen in underground shafts is intrinsically safer and less obtrusive than above ground options and is a solution that does not require unique geology such as salt caverns."



## Delays and repairs hit nuclear units

New delays have hit the start of energy production at Finland's Olkiluoto 3 nuclear power plant and commercial operation has been postponed from July to September, according to operator Teollisuuden Voima Oyj (TVO).

The reactor went online in March, 12 years behind schedule. It will meet around 15 per cent of Finland's electricity needs but TVO said "inspection and repair needs concerning the cooling system of OL3's generator will last approximately three weeks".

In UK new-build, EDF has now admitted that startup of its Hinkley Point C plant will be delayed by a year to June 2027 and it will cost an extra £3 billion, although the Contract for Difference funding means the cost will not fall on consumers. Costs are now

estimated at £25-26 billion.

EDF said it lost more than half a million days of critical work in 2020 and 2021 because of Covid measures. A government decision on whether to award development consent for a follow-on unit, Sizewell C, has been delayed after ministers said they needed more time to look at new information. The final decision is now expected by July 8.

Meanwhile in France, 12 of EDF's 56 nuclear power plants have been taken offline over safety concerns. EDF confirmed recently that it had lowered its electricity production target for the year to 280-300 TWh, instead of 295-315 TWh. EDF said it was working at full speed to repair any damage.



## German networks prepare for renewables-based system

■ Offshore wind farm qualifies to provide stability services  
■ Grids plan expansion to accommodate more renewables

Janet Wood

A German offshore wind farm is the first to win approval on the basis that it will be used to help balance the transmission grid as the country's amount of renewables grows.

The 312 MW wind farm, Borkum Riffgrund 1 will produce electricity specifically to stabilise power supplies, taking the place of conventional coal and nuclear plants, which are being progressively shut down.

The wind farm underwent prequalification by transmission system operator (TSO) TenneT, which showed it is able to balance short-term grid fluctuations. The concept was approved by the other three TSOs in Germany.

Joerg Kubitz, Managing Director at the German division of Ørsted, which part owns Borkum Riffgrund 1, said it

was "breaking new ground" that had been reserved for conventional energy sources.

The project is expected to encourage other wind farms to become qualified so their power can be traded on the German balancing power market in the future.

Meanwhile German grid owners are planning on major expansion to accommodate renewables and investments will be made also in technologies such as Statcom systems to ensure the stability of the grid at all times.

Hansewerk AG will invest nearly €1.2 billion into expanding the power grid in northern Germany in the next three years, while operator Amprion GmbH said it is planning to spend €12 billion on expansion in the period to 2026. Amprion's investment is focused on expanding the north-south axes of

the power grid to enable electricity supply from offshore wind in the north to be transmitted onshore. A major initiative in this area is a project that will allow for 4 GW of wind power to be transported to the Ruhr area from 2030, replacing the capacity of five large coal fired power plants. It also recently unveiled plans to increase electricity distribution capacity in North Rhine-Westphalia by 8 GW by the end of the decade, requiring €4 billion of investment by 2026.

Hansewerk AG said expansion was required to prepare for a boom in e-mobility and new renewable energy capacity. Chief Executive Matthias Boxberger warned that without expansion, renewable generation will have to be compensated to the tune of millions of euros because they are not able to export their power to the grid.

## Offshore wind and major PV rollout to help Europe cut power costs

European countries are looking for fast roll-out of offshore wind and solar power to help reduce energy imports as well as cut soaring electricity prices.

Illustrating the offshore wind industry's ambition, Deep Wind Offshore has started consultation for a 6 GW floating offshore wind project in the Swedish Baltic Sea. The Erik Segersall project will have 240 units of 25 MW

or 300 units of 20 MW turbines. The same area could see two floating wind projects from Irish blue economy developer Simply Blue Group, which recently announced plans for floating wind projects totalling 5 GW.

Other new offshore wind areas are also opening up for development, including Greece, where a new legislative framework for offshore wind development is expected to open for

public consultation shortly.

In the solar sector, last month there were announcements for several large-scale projects.

In Zwartowo, Poland, the European Bank for Reconstruction and Development (EBRD) has agreed to provide a \$47.8 million in funding for the construction and operation of a 285.6 MW solar project. Stigma – a special purpose vehicle owned by Solarnet

Investment – will deliver the project.

In Germany the Federal Network Agency recently launched a tender for 1.125 GW of large-scale solar projects, open to bids by June 1. In addition, renewable energy company Green Genius said it will install 500 MW of solar power plants in Lithuania by 2025, along with 200 MW of wind power.

Meanwhile, five EU member states

have called for mandatory solar panels on some types of buildings, saying it would help the bloc's reduce its energy dependency on Russia. In a letter to the European Commission, Austria, Belgium, Lithuania, Luxembourg and Spain have called for solar panels on public buildings, factories, supermarkets and other buildings with flat roofs, and solar panels as standard on new houses.

# Energy industry must do more to prevent cyber attacks

- Fears grow of serious impacts on assets and people
- Operational technologies not sufficiently prioritised

Nadia Weekes

Cyber attacks on the energy industry are likely to cause harm to life, property and the environment in the next two years, according to research by risk management and quality assurance provider DNV.

The Cyber Priority research report is based on a survey of 948 energy professionals around the world and in-depth interviews with industry executives.

As many as 84 per cent of the interviewees expect physical damage to assets, but less than half (47 per cent) believe that the security of their operational technologies (OT) is as robust as their IT security.

Fewer than a third (31 per cent) of the energy professionals surveyed are confident that they know exactly what to do if they have concerns about a potential cyber risk or threat, pointing to the need for more training.

Less than half (44 per cent) see the

need for urgent improvements to prevent a serious attack on their business, despite emerging threats.

Growing fears over new and more extreme consequences of cyber attacks follow a series of high-profile security breaches in the energy industry. The research also indicates that concern about emerging threats has grown following Russia's invasion of Ukraine.

"Energy companies have been tackling IT security for several decades. However, securing operational technology – the computing and communications systems that manage, monitor and control industrial operations – is a more recent and increasingly urgent challenge for the sector," said Trond Solberg, Managing Director of Cyber Security at DNV.

"As OT becomes more networked and connected to IT systems, attackers can access and control systems operating critical infrastructure such as power grids, wind farms, pipelines and

refineries," he said.

Six in ten C-suite level respondents to DNV's survey acknowledge that their organisation is more vulnerable to an attack now than it has ever been. However, there are signs that some companies are taking a 'wait, see and hope for the best' approach to the threat.

More than a third (35 per cent) of energy professionals say their company would need to be impacted by a serious incident before investing in their defences.

"It is concerning to find that some energy firms may be taking a 'hope for the best' approach to cyber security rather than actively addressing emerging cyber threats," said Solberg.

DNV recommends that the first step to strengthen defences is to identify where critical infrastructure is vulnerable to attack, including companies that organisations partner with and procure from.

Just 28 per cent of energy professionals working with OT say their company is making the cyber security of their supply chain a high priority for investment – in contrast with the 45 per cent of OT-operating respondents who say expenditure in IT system upgrades is a high investment priority.

"Energy companies can have complete oversight of their own vulnerabilities and have all the right measures in place to manage the risk, but that won't make a difference if there are undiscovered vulnerabilities in their supply chain," said Jalal Bouhdada, Founder and CEO at DNV-owned Applied Risk, an industrial cyber-security firm.

"Our research identifies 'remote access to OT systems' among the top three methods for potential cyber attacks on the energy industry," he added. "We would urge the sector to pay greater attention to assuring that equipment vendors and suppliers

demonstrate compliance with security best practice from the earliest stages of procurement."

Research by Moody's Investors Service has highlighted the increased cyber security risk deriving from the continued growth of intermittent renewable electricity generation, distributed generation, cross-border flows and new sources of demand, including electric vehicles and heat pumps.

The increased number of access points for the cyber attacker to the network management system makes it difficult to analyse the root causes of malfunctions, especially the detection of manipulations, the researchers noted.

Several networks have made changes as a result, including to the reporting structure so as to provide the company's board of directors with a clearer understanding of cyber security protection measures and incident reporting, Moody's said.

## Multinational partnership to bolster geothermal energy in Egypt

A coalition of 14 Egyptian and international entities has been formed to enable geothermal energy capacity building in Egypt through projects implemented in cooperation between the government and the private sector.

The participating parties include the New and Renewable Energy Authority, a number of Egyptian universities, Italy's Bologna University, and companies including Giorinco, South Valley, Ecoforest and Taylor.

The project aims to fully conceptu-

alise the Egyptian potential for geothermal projects and to introduce Egypt's first postgraduate diploma in geothermal energy engineering aligned with European standards.

The Egypt Geothermal Capacity Building Project seeks to develop stronger relations between higher education institutions in Egypt and the EU in the field of geothermal energy, and to strengthen the network between Egyptian universities and local geothermal companies.

## Octopus Energy joins Morocco-UK renewable power transmission project

UK's Octopus Energy Group has formed a financial and strategic partnership with Xlinks, the UK firm proposing a project to connect a 10 GW solar and wind energy complex in the Moroccan desert with Devon in South West England via the world's largest subsea power cable.

The Xlinks Morocco-UK Power Project is expected to deliver 3.6 GW of clean power to the UK for an average of 20 hours a day. Octopus said this is enough to power as much as

seven million heat pumps all year round.

The project is currently under development, with economic, environmental and archaeological impact assessments underway. It is expected to go online in 2027 and to provide power at £48/MWh (\$59/MWh).

Details of the partnership's scope were not provided. Octopus said that further investments are under discussion and offtaking rights for Octopus are being considered.

## Slow global coal phase-out puts climate targets at risk

The world is moving away from coal power too slowly to meet pivotal targets on limiting global warming, a new report finds. **Nadia Weekes reports**



With more than 2400 coal fired power stations operating in 79 countries, an additional 176 GW of coal capacity under construction at 189 plants and a further 280 GW planned at 296 plants, climate goals are in peril, a new report by Global Energy Monitor warns.

The figure for new coal fired power stations in 2021 represents the lowest rise on record, with 34 countries having new coal plants under consideration, down from 41 countries the previous year. Nonetheless, this fall is not enough to bring runaway global warming to heel, and steeper cuts are needed to achieve climate goals, the report's authors said.

"The directive for a fighting chance at a liveable climate is clear: stop building new coal plants and retire existing ones in the developed world by 2030, and the rest of the world soon after," the report says.

An increase in coal-powered energy production followed the post-Covid rebound, as countries slowed coal fired power plant retirements.

"Despite progress at [the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change] COP26, coal's last gasp is not yet in sight," the report states.

"At a time when developed countries should be helping the rest of the world to both end new coal plant construction and begin their coal transitions in earnest, many are instead planning to operate their coal plants at home far beyond the deadlines required by climate science and are clinging on to the false promise of 'clean coal' technologies," it adds.

More than half (56 per cent) of the 45 GW of newly commissioned coal capacity last year was in China, the report finds. In 2021, the Chinese started construction of 33 GW of new coal power plants – the most since 2016 and almost three times as much as the rest of the world put together.

In the US, the rate at which coal fired power stations were retired fell, from a record 21.7 GW switched offline in 2015 to 16.1 GW in 2019, 11.6 GW in

2020 and less than 9 GW in 2021. To meet climate goals, the US needs to retire 25 GW annually on average between now and 2030.

Meanwhile, the Group of Seven major economies (G7) is looking to expand an initiative to support developing countries in their efforts to phase out coal, starting with Indonesia, Vietnam, India and Senegal.

South Africa received a pledge of \$8.5 billion in assistance to transition away from coal at COP26 in 2021.

The G7 is looking to expand this support framework, with Japan and the US expected to be Indonesia's major contributors, in partnership with other G7 members and the EU.

The UK and the EU would be major contributors for Vietnam, with the US and Germany filling the role for India. The amount of assistance for each has yet to be agreed.

The initiative will also tap into the Asian Development Bank's planned fund and financing scheme for the early transition away from coal in Southeast Asia.

# Energy companies may be next to face UK windfall tax

- Electricity generators made £10 billion in “excess” profits
- SSE posts 44 per cent increase in full-year pre-tax profit

Junior Isles

UK electricity generating companies are bracing themselves for a possible windfall tax following the government’s move to put an ‘Energy Levy’ on extraordinary earnings made by oil and gas operators as a result of record gas prices, which in turn have driven electricity prices to all-time highs.

Government officials believe electricity generators have made £10 billion in “excess” profits from high wholesale power prices in the last year.

Just ahead of the government’s decision to tax oil and gas operators, Scottish energy company, SSE, insisted it will invest “significantly more” in

expanding Britain’s energy infrastructure in the next few years than it earns in profit.

SSE Chief Executive Alistair Phillips-Davies did not address a windfall tax directly in remarks published alongside full-year results last month, but said the company could invest more than £24 billion in Britain by the end of 2030 to help the country reach its clean energy ambitions.

SSE posted a 44 per cent increase in full-year pre-tax profit to £3.5 billion. Its £24 billion-plus investment forecast is up from a previous ambition of £12.5 billion by 2026.

Sue Ferns, Senior Deputy General Secretary of Prospect union, respond-

ing to the Chancellor on leaving the door open to a future windfall tax on electricity generating companies, said: “As the government considers taxing energy generators further, it must find a way of treating those generators who are supporting the loss-making retail market, and making big investments in new nuclear and renewables, differently to those who are not.”

Other industry experts argue that the government must address systemic problems with pricing in the energy sector.

Responding to the Energy Levy on oil and gas operators, Michael Grubb, Professor of Energy and Climate Change & Deputy Director, UCL

Institute for Sustainable Resources, said: “After resisting for months, a windfall tax was becoming inevitable. The first focus will be on the government plans for redistributing the revenue. But a second question is now also unavoidable. What will the government do with the UK energy system?”

“Our electricity market means that consumers pay doubly for the high cost of gas – once through heating, and again through the impact of gas on electricity prices, even though renewable energy is now far cheaper. It is the system itself that needs bold measures: to invest in energy efficiency, removal of obstacles to the cheapest and quickest renewables available, and reform

how the market works.”

While Energy UK, the trade association for the energy industry, welcomed the levy and support to help energy customers, it warned against a similar move on energy suppliers.

Energy UK’s Director of Advocacy, Dhara Vyas, said: “As the Chancellor mentioned in his speech, the government’s Energy Security Strategy has made it clear that the current crisis underlines the need to reduce our dependency on expensive fossil fuels and expand our domestic sources of clean, cheap power. We would caution against any action, such as a windfall tax on generators, that could jeopardise these aims and the investment required.”

## Wind turbine manufacturers under pressure, as market in “dire straits”

Vestas and Siemens Gamesa, two of the world’s major wind turbine manufacturers, have reported further losses as the market continues to struggle with the rising cost of materials and supply chain issues exacerbated by Russia’s invasion of Ukraine.

At the start of last month, Danish wind turbine maker Vestas Wind Systems A/S reduced its full-year outlook, as its net loss in the first quarter widened to €765 million from €64 million a year earlier.

The company said it has been hit severely by write-downs, partly as a result of its decision to withdraw from Russia. In addition, there were write-downs related to legacy offshore activities. Performance in the quarter was also affected by continued external cost inflation and supply chain disruptions.

To address the current market conditions, Vestas is adjusting its manufacturing footprint, which led to special items of €183 million as it intends to stop production at certain factories in China and India.

Vestas, which in April said it would dispose of its Russian assets, said costs related to the war amounted to €401 million in the first quarter.

“The business environment worsened significantly during the first quarter of 2022 due to Russia’s invasion of Ukraine, and the associated ripple effects on global trade and cost inflation,” Vestas said in its earnings report.

German-Spanish wind turbine manufacturer, Siemens Gamesa is also struggling with the difficult market conditions. Last month it recorded net losses of over €300 million for two quarters straight.

Like its competitors, the company

has suffered from sharp increases in the cost of steel, copper and rare earths used in wind turbines – costs that it is often unable to pass on to customers because of long-term contracts signed when commodity prices were cheaper.

Christian Bruch, President and CEO of Siemens Energy AG said renewable energy would “get more expensive and must reflect the volatility in the market”, stressing that predictions that the price of wind energy would keep falling predated the supply chain crisis gripping the industry.

“If oil stays at \$100 [a barrel], then OK, I think it gives you enough headroom,” said Bruch. “But don’t forget the assumption two years ago... was that offshore wind in 2030 will probably be half the price compared to 2021 or 2020,” he added. “That is a logic which doesn’t prevail if your material costs double.”

Bruch warned that the wind energy market was “in dire straits at the moment” and predicted there could be some consolidation in the industry.

The pessimistic outlook came as Siemens Energy announced its €4 billion offer to buy the remaining 33 per cent of Siemens Gamesa, the world’s largest offshore wind turbine maker.

Acquiring the remainder of Siemens Gamesa will give Siemens Energy greater control over the struggling company, said Bruch, but cautioned that it would take until the middle of the decade for the turbine maker to deliver consistent profits.

The International Energy Agency also warned that wind and solar were “set to lose momentum next year” after growing rapidly, citing supply chain and logistics constraints.



## UK offshore oil and gas operators to pay ‘levy’ on windfall profits

The UK government has imposed a windfall tax on oil and gas operators in an attempt to ease pressure on households struggling as a result of high energy prices. OEUK warns, however, that it could jeopardise future investment in the sector. **Junior Isles**

UK offshore oil and gas operators are to pay an ‘Energy Profits Levy’ on profits as the government attempts to tackle the country’s deepening cost of living crises.

In the face of spiralling energy prices the government has slapped an additional 25 per cent tax on UK oil and gas profits to raise in the region £5 billion in its first 12 months, which will go towards supporting household energy bills.

The tax which took effect from May 26 is being legislated for via a stand-alone Bill. In future years, if oil and gas prices return to historically more normal levels, the government will phase out the Energy Profits Levy and the legislation, which includes a sunset clause that will become effective at the end of December 2025.

Offshore Energies UK (OEUK), (formerly OGUK, the organisation representing the UK oil and gas sector), said the move could be damaging

and represented a “backward step” by the government.

“The Energy Profits Levy will discourage UK offshore energy investments, meaning declines in oil and gas exploration and production, and so force an increase in imports. This is the exact opposite of what was promised in the British Energy Security Strategy published just last month,” warned Deirdre Michie, OEUK’s Chief Executive.

Michie said she recognised that surging energy bills meant an exceptionally tough year for consumers, so help was vital “but funding that help through sudden new taxes was damaging to British business”.

Those hit hardest, she warned, would include not just the major operators, but also the many other companies in the UK supply chain, providing specialised equipment and services to the oil, gas and renewable industries.

According to a new analysis from Greenpeace UK and Oil Change International, the recent spike in oil and gas prices could provide oil and gas companies operating in the UK with unexpected windfall profits of £11.6 billion this year.

Commenting on the windfall tax, the environmental lobby group said in a statement: “By using a big chunk of the bloated profits that Shell, BP and others are raking in to make homes warmer, more energy efficient and kitted out with heat pumps, the government could start to really tackle the climate and cost of living crises simultaneously.”

At the start of May, Shell reported adjusted earnings of \$9.13 billion in Q1 2022 – its highest ever first quarter profits – up from \$3.2 billion. BP recorded an underlying profit of \$6.2 billion in Q1 2022, up from \$2.6 billion in the previous year and \$4 billion in the final three months of 2021.

## 10 | Tenders, Bids & Contracts

### Americas

#### Chile battery storage order for Mitsubishi Power

Innergex Renewable Energy has awarded Mitsubishi Power an order for two utility-scale battery energy storage systems (BESS) for its Emerald storage solution totalling 425 MWh in the Atacama desert of northern Chile. These projects will be co-located with existing solar photovoltaic (PV) facilities.

These BESS projects are Mitsubishi Power's first in South America. They will add 50 MW/250 MWh of storage capacity to the Salvador solar PV facility and 35 MW/175 MWh of storage capacity to the San Andrés solar PV facility. Both are scheduled to come online in 2023.

The BESS projects represent a combined investment of around \$128.5 million.

Salvador and San Andrés are Innergex's first utility-scale BESS projects in Chile. The projects will provide grid resiliency to the country's existing transmission and distribution infrastructure.

#### Vestas wins orders in Argentina and Brazil

Vestas has won an order to supply and install 81 MW of turbines for a wind farm expansion project in Argentina for aluminium smelter Aluar Aluminio Argentino (ALUA), which is investing \$130 million to expand its existing 165 MW wind farm in Chubut province.

Vestas will supply 18 units of its V150-4.5 MW turbines for the Llano IV project. The order also includes a 20-year Active Output Management 5000 service agreement. Vestas plans to deliver the turbines in Q4 2022 and commission the wind farm in Q3 2023.

In addition, Pan American Energy Energias Renováveis has awarded a contract to Vestas to supply and install wind turbines for the 423 MW Novo Horizonte wind project in the Brazilian state of Bahia. Vestas will supply 94 units of its V150-4.5 MW turbines. The contract also includes a 20-year service agreement. The turbines are scheduled to be delivered and commissioned in 2024.

#### Exus provides solar asset management in Texas

Copenhagen Infrastructure Partners (CIP) has chosen Exus Management Partners (Exus) to provide asset management services for the Greasewood, Misae, and Sage solar projects across Texas and Utah, totalling 750 MW.

The deal incorporates a five-year initial term allowing Exus to fully demonstrate its scope of asset and financial management, O&M, and project management services.

Mads Skovgaard-Andersen, Partner at CIP, said: "We are pleased to continue collaborating with Exus who have consistently demonstrated their ability to go above and beyond our expectations regarding management of our renewable energy assets. Optimising and maintaining solar projects is essential to maximising returns for our investors."

### Asia-Pacific

#### GE wins first 9HA CCGT order to Vietnam

GE has won a contract from Samsung C&T to supply power generation equipment for PetroVietnam Power's (PV Power's) Nhon Trach 3&4 power plant in Ong Keo Industrial Park in the Nhon Trach district, around 70 km southeast of Ho Chi Minh City.

The 1.6 GW plant is scheduled to enter commercial operation by 2025. It will be the first plant fuelled by LNG in the country.

GE will provide two blocks of over 800 MW, each block including: a GE 9HA.02 gas turbine, an STF-D650 steam turbine a W88 generator, an HRSG, and GE's integrated Mark VIe distributed control system.

Vietnam is currently heavily reliant on coal, which fuels around a third of its electricity output. The growth of gas fired power generation will support both coal-to-gas transition and accelerate renewables penetration by enhancing the reliability and stability of the energy grid.

#### Taipower awards 60 MW BESS contract

Taipower has awarded a contract to Fluence Energy, a joint venture between AES and Siemens, and Teco Group to install a 60 MW/96 MWh battery-based energy storage system (BESS) at Taoyuan Longtan substation. The system will cost an estimated \$88 million.

#### Vena Energy selects ODE as owner's engineer

Offshore Design Engineering (ODE) has been selected as owner's engineer for Vena Energy's 384 MW Yokji offshore wind farm in South Korea. ODE will oversee a range of services across the two-year contract.

The project is scheduled to enter commercial operation by 2026.

Jinho Paik, ODE's Korea Country Manager, said: "This is an exciting period of development for the Korean offshore wind market. With a strong foundation of work in Korea already secured, we look forward to drawing on our presence in Seoul and our expert service offering to continue to build relationships with the country's offshore wind developers."

### Europe

#### Linxon wins Swedish order for substations

Vattenfall Eldistribution has awarded Linxon an order to supply two turnkey substations to replace old equipment in Gullarängen and Nynäshamn. This is part of Vattenfall's programme to upgrade the electricity grid around Stockholm. The order is worth around \$12 million.

As part of the order, the existing 70 kV air-insulated outdoor switchgear will be replaced by 130 kV gas-insulated indoor switchgear. The medium-voltage switchgear as well as a power transformer will also be replaced in Gullarängen.

Linxon will also construct two buildings for the substations. The project is scheduled for completion in 2024.

#### Optimisation work at Cernavoda Candu reactor

Candu Energy, a member of the SNC-Lavalin Group, has been chosen by Nuclearelectrica, operator of the Cernavoda nuclear plant, to conduct optimisation work at the unit 1 reactor. SNC-Lavalin will perform axial channel shifting for several fuel channels in Unit 1 during a three-year period.

Axial channel shifting is a maintenance activity that adjusts elongation of the reactor's fuel channel tubes. This maintenance activity performed in advance of the refurbishment allows for a more cost-efficient and time-efficient refurbishment process. The effective shutdown of Cernavoda Unit 1 for refurbishment purposes is scheduled, based on Nuclearelectrica development strategy, throughout 2027-2029.

The mandate will see SNC-Lavalin personnel deploy onsite to Cernavoda to carry out the work, which will be conducted over two outages. SNC-Lavalin will be responsible for the design, manufacturing, testing, and transportation of the full suite of axial shifting tools and accessories that are required.

#### Siemens Gamesa to develop Serbian wind farm

Siemens Gamesa will develop the 66 MW Kostolac wind farm, its first project in Serbia, and the first wind project for the Serbian state power company EPS. The site will deploy 20 SG 3.3-132 turbines. The contract covers the turnkey construction of the wind farm, including civil and electrical balance of plant with substation.

The turbines have a rated power of up to 3.65 MW. Installation is scheduled to be complete in 2024.

The contract was the first wind power project in Serbia to be financed by German development bank KfW.

#### EPCI contract for 30 MW floating wind project

EolMed, a joint venture of BW Ideol, Qair and TotalEnergies, has awarded an engineering, procurement, construction and installation (EPCI) contract to Bourbon Subsea Services for the 30 MW EolMed floating wind pilot project in the French Mediterranean Sea.

The wind farm will be located off the coast town of Gruissan in the Occitania region and will consist of three 10 MW turbines.

Completion of the wind facility is scheduled for the middle of 2024.

#### Valmet wins order at Vilnius CHP plant

Valmet has won an order to complete the biomass boiler, flue gas cleaning and flue gas condensing system works for Vilnius CHP plant in Lithuania. Vilnius CHP is working on a modern heat generation capacity expansion project in the Vilnius central heating system. The order came about because the original contractor was unable to complete the works.

The order is valued at around €30 million. Valmet will perform a technical assessment of biomass boilers, complete the biomass boiler, flue gas cleaning and flue gas condensing system installation works, carry out commissioning works (cold and hot tests), train the power plant's personnel and prepare the instructions for using the biomass unit.

Since 2020, the power plant has been generating energy using municipal waste. After the biomass project is complete, energy will also be generated using biomass.

#### Walney 1 O&M contract for RES

O&M services for offshore transmission (OFTO) assets at Walney 1 Offshore Wind Farm has been awarded by Blue Transmission Walney 1 to RES. RES will provide scheduled and unscheduled maintenance of equipment, site management, logistics and control centre services.

Walney 1 Offshore Wind Farm is located in the Irish Sea, off the Cumbrian coast of the UK, with the offshore substation platform located 15 km from the coast of Walney Island and 18 km from Barrow-in-Furness. The offshore substation is connected to shore by a 45 km undersea cable, which comes ashore near Heysham. The onshore cables connect to the Heysham onshore substation

### International

#### Saft energy storage system for Côte d'Ivoire

Saft has won a major contract from Eiffage Energie Systèmes to deliver a 10 MW energy storage system (ESS) to ensure smooth grid integration for the Boundiali solar PV power plant in Côte d'Ivoire. The 37.5 MW plant, owned and operated by Côte d'Ivoire Energies (CI Energies), will be the first large-scale solar project in the country.

The lithium-ion ESS will comprise six Saft Intensium Max High Energy containers, providing a total of 13.8 MWh energy storage, together with power conversion and medium voltage power station systems.

The primary role of the ESS will be capacity firming and smoothing of the solar plant's output to ensure a predictable and reliable feed into the local grid.

The Saft ESS is scheduled for commissioning at the Boundiali site in September 2022.

#### Alba signs deal to expand Power Station 5

Aluminium Bahrain (Alba) has signed a turnkey contract with Mitsubishi Power and SEPCO III consortium to expand Power Station 5 at Alba in Bahrain, adding a new 680.9 MW combined cycle gas turbine (CCGT) block.

Shaikh Daij Bin Salman Bin Daij Al Khalifa, Chairman of Alba's Board of Directors, said that Alba is on course to start the construction works for its fourth additional block in Power Station 5.

Mitsubishi Power & SEPCO III will be responsible to design, engineer, procure, construct and commission the new CCGT power block. Mitsubishi Power will supply a combined cycle power plant, which comprises a M701JAC gas turbine and a steam turbine. JAC gas turbines are capable of using up to 30 per cent hydrogen fuel, to reach 100 per cent hydrogen with minimal existing infrastructure modification.

Commercial operations are scheduled to start in Q4 2024.

#### Morocco awards 117 MW PV contract to Volitalia

Volitalia has been awarded a contract to develop two solar PV plants with a combined total capacity of 117 MW in Morocco. The contracts were awarded under the competitive tendering process for the Noor 2 PV Programme.

Volitalia will develop a 69 MW project in Ain Beni Mathat and a 48 MW project in Guercif. Volitalia will sign power purchase agreements with private customers connected to the public electricity grid.

The Moroccan Agency for Sustainable Energy (Masen) said that Volitalia was awarded the largest capacity under the Noor 2 PV programme.

#### Wärtsilä wins Kahraba upgrade contract

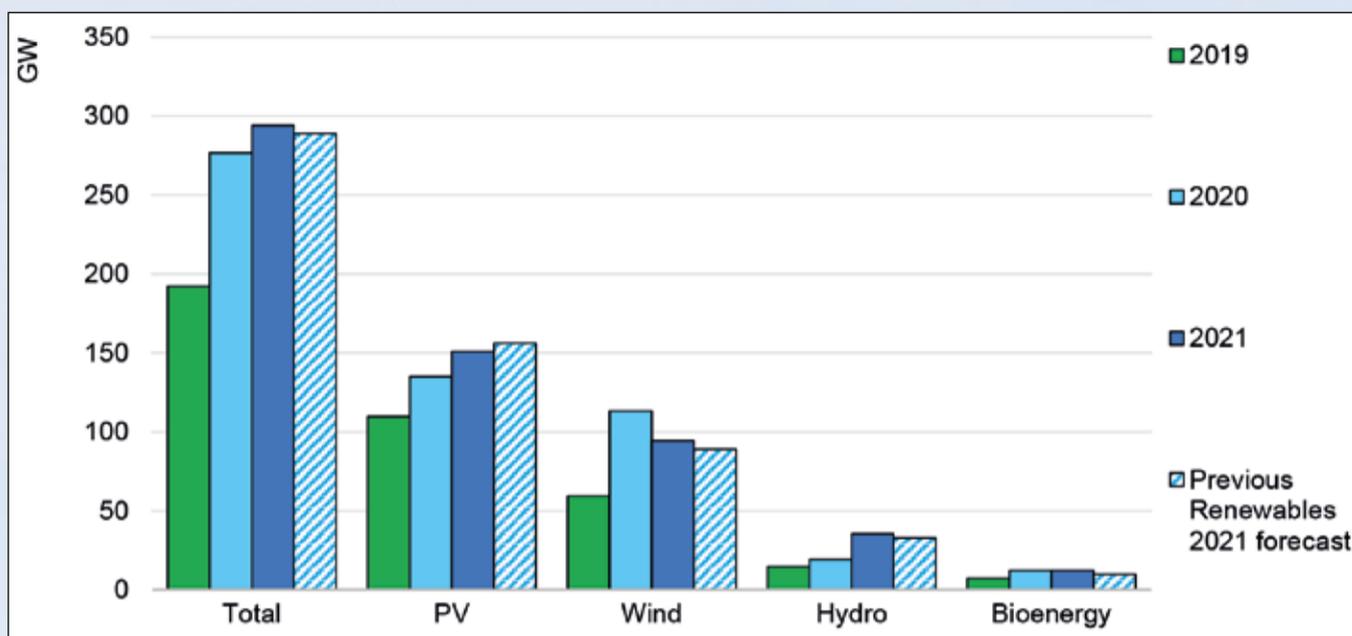
Kahraba, a subsidiary of Egypt Kuwait Holding, has awarded a contract to Wärtsilä to upgrade the Borg El Arab power plant, located around 45 km from Alexandria, Egypt. Wärtsilä will supply equipment to add 20 MW to the plant, as well as upgrade the existing 40 MW plant with a new control system.

The plant currently has four Wärtsilä 34SG engines running on natural gas. Wärtsilä is adding two extra 34SG units to enable the plant to meet increased demand.

The extended Borg El Arab plant is expected to become fully operational in 2023.



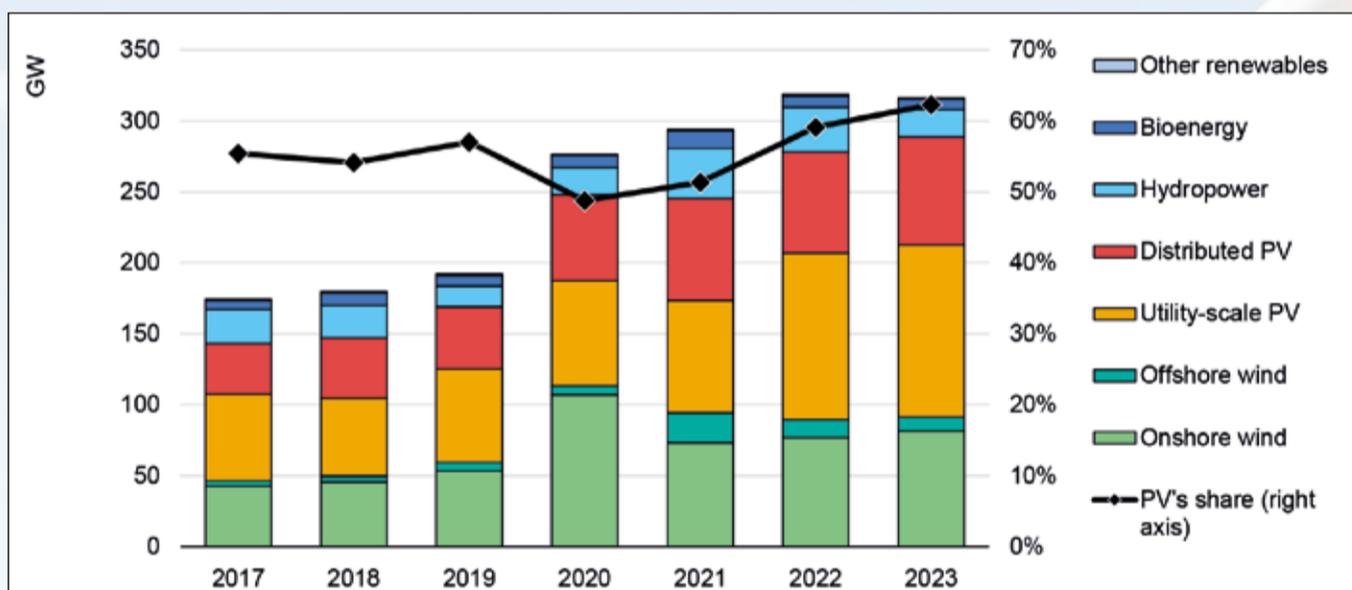
**Renewable net capacity additions, 2019-2021**



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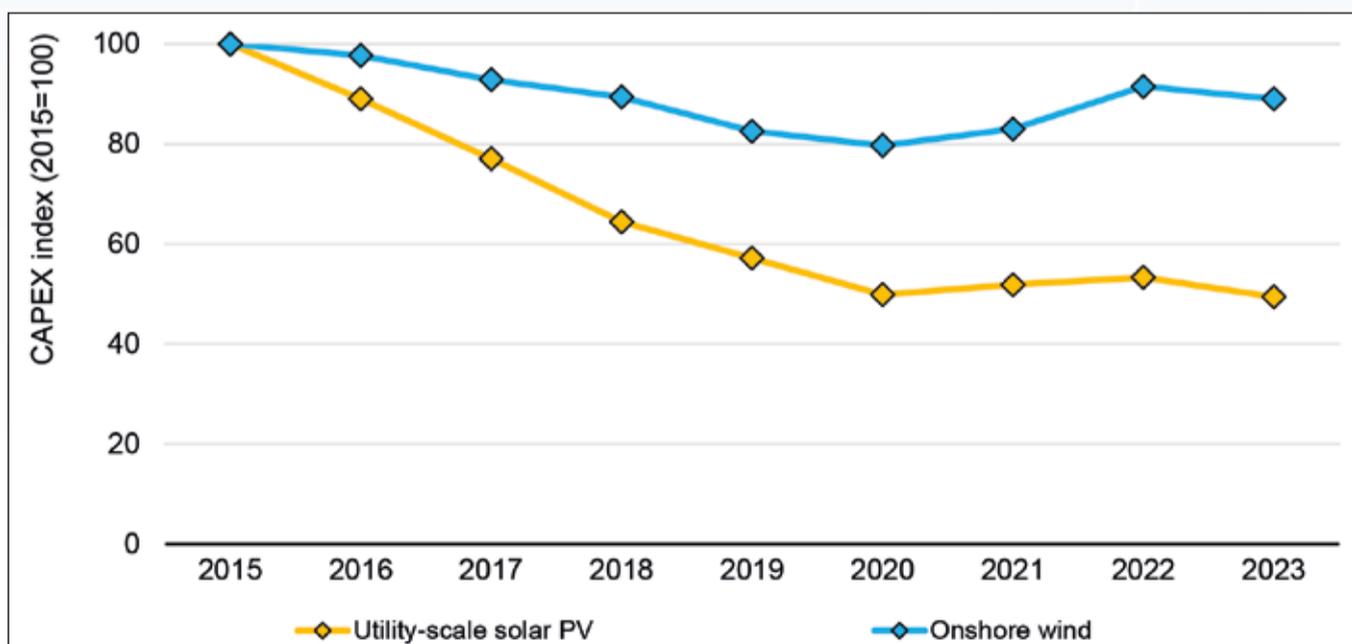
Renewable Energy Market Update: Outlook for 2022 and 2023, page 5

**Net renewable capacity additions by technology, 2017-2023**



Renewable Energy Market Update: Outlook for 2022 and 2023, page 8

**Solar PV and onshore wind investment cost estimates for new contracted projects under high commodity prices**



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## Hydrogen

# Nutrien plans world's largest clean ammonia plant, CF Industries on similar track

While there is great alarm over the current prices of oil and gas, these price hikes are destined to fuel the energy transition. Many firms are hard at work shifting to cleaner fuels, including two North American-based companies planning large ammonia production facilities using carbon capture and storage.

Gary Lakes

Canadian fertilizer company Nutrien announced last month that it is planning to build the world's largest clean ammonia production facility in Geismar, Louisiana. The Saskatoon-based company said it has reached agreement with Denbury Carbon Solutions for the capture and storage of 90 per cent of the plant's CO<sub>2</sub> emissions in a nearby underground aquifer.

Nutrien said in a statement that the project will proceed to the front-end engineering design (FEED) phase, with a final investment decision expected to follow in 2023. If approved, construction of the \$2 billion facility would begin in 2024 with full production expected by 2027.

Clean ammonia would be manufactured using innovative technology to achieve at least a 90 per cent reduction in carbon emissions, the company said.

Target production capacity is 1.2 million tons/year of blue ammonia and the permanent sequestering of more than 1.8 million tons/year. (Blue ammonia

is produced through the use of natural gas.)

"The new plant will use auto thermal reforming technology to achieve the lowest carbon footprint of any plant at this scale and has the potential to transition to net zero emissions with future modification," a statement released by the company said.

Nutrien's agreement with Denbury allows for expansion of the existing volume of carbon sequestration capability in the immediate vicinity of its Geismar facility. Denbury is an independent energy company active in the US Gulf Coast and Rocky Mountain regions. Its operations focus on carbon capture, use and storage (CCUS) and enhanced oil recovery (EOR).

Denbury has an existing agreement with Nutrien to take some 300 000 tons/year of CO<sub>2</sub> captured from Nutrien's existing nitrogen plants in Louisiana. Denbury uses the CO<sub>2</sub> for EOR for its drilling company clients in the Houston area of Texas. The CO<sub>2</sub> is transported there via the 320-mile Green Pipeline.

Denbury also transports CO<sub>2</sub> from

the Jackson Dome in Mississippi through a 183-mile pipeline that connects with the Green Pipeline and distributes CO<sub>2</sub> for EOR in the Gulf region.

As another aspect of its plan for a new ammonia production company, Nutrien has signed a Letter of Intent (LoI) with Japan's Mitsubishi Corporation for the offtake of up to 40 per cent of production. The ammonia will be delivered to the Asian fuel market once operations begin.

US fertilizer company CF Industries is also looking to build a new ammonia-producing facility on the Gulf Coast. It announced last month that it had teamed up with Japan's Mitsui & Co to jointly develop a greenfield ammonia production facility that will likely be located in Louisiana.

This facility will also rely on carbon capture and storage to produce blue ammonia. A company statement said the plant looks to sequester 60 per cent of the CO<sub>2</sub> emissions produced during the process. CF Industries has nine production complexes in the US, Canada and the UK and produces nearly

10 million tons annually of nitrogen-rich ammonia.

Already under construction by CF Industries is an electrolyser plant for green ammonia production of the factory complex in Donaldsonville, Louisiana. The company is working with Thyssenkrupp to install 20 MW of hydrogen electrolysis capacity that will feed the existing ammonia synthesis plant. The facility will purchase green electricity to provide 100 per cent of its energy requirements and production is targeted to reach 20 000 tons of green ammonia annually. The company said this will be the first commercial-scale green ammonia plant in North America.

"We are on a path to decarbonise our ammonia production network – the world's largest – to enable green and blue hydrogen and nitrogen products for energy, fertiliser, emissions abatement and other industrial activities," the company said in a statement.

"Demand for blue ammonia is expected to grow significantly as a decarbonised energy source, both for its hydrogen content and as a fuel itself,"

the statement said, adding that the two companies have secured the right to acquire a site for the plant on the Gulf Coast suitable for export-oriented blue ammonia and have started the selection of a technology provider for blue ammonia production capacity. They have agreed that Mitsui will lead the marketing and distribution for blue ammonia in Asia, while CF Industries will be responsible for plant operations and maintenance.

The FEED study is to begin soon, CF Industries said, adding that a final investment decision (FID) for the product could take place in 2023, after which construction would begin, with a target start date for production in 2027.

Meanwhile, CF industries expects to manufacture up to 2 million/year of blue and green ammonia at its existing facilities beginning in 2024. Recognising the growing demand for blue ammonia in Asia, the two companies are discussing commercial expansion of the joint venture to take advantage of Mitsui's marketing and distribution capabilities in that market.

## Gas

# Consequences of Ukraine war plague Russia's future as global energy source

Vladimir Putin has on several occasions used Russia's vast energy resources to apply political pressure in Europe, but his invasion of Ukraine appears to be the last time that Europe will tolerate that game. Western actions look determined to push Russian energy out of global markets and keep it that way.

Gary Lakes

The Ukraine war has demonstrated beyond doubt that energy can be used as a weapon. Russia's invasion of its neighbour created great alarm in Europe, which found itself at risk from aggressive actions by Moscow due to its heavy reliance on oil, gas and coal supplies from Russia.

Steps were taken, sanctions imposed, and the European Union is now looking at a time when it will have alternative sources of energy in place. For now, many EU members continue to receive Russian energy fuels even as the war in Ukraine rages, but sanctions and boycotts by countries and refineries are reported to be having a serious impact on the Russian energy sector and setting back projects that are important for Russia's role as a future energy giant.

Sanctions make it difficult to pay for

Russian energy in dollars and Moscow has countered by saying that unfriendly countries must pay for their energy purchases in roubles, as doing so would boost the ailing Russian currency. But some countries have refused.

Last month Russia halted gas supplies to Poland and Bulgaria because they would not follow Moscow's instructions. Russia also shut off gas supplies to Finland after it (along with Sweden) applied to join NATO.

Russia, however, continues to make money as supply shortages have pushed oil and gas prices higher. While Russia is selling oil at a discount on the stock market, revenues continue to be good. The US and UK have banned Russian oil imports, and the EU has yet to get through political differences that would ban sales amongst its members.

In the meantime, India and to some extent China are taking up offers of

buying discounted Russian crude on the spot market, and the crude that cannot be sold is being put into storage and in tankers that have yet to find a destination.

Poland, which had long depended on Russia for gas supplies, has been a long-time critic of Moscow's energy policies and argued against Russia's Nord Stream gas pipeline project in the Baltic Sea, but to no avail. Nord Stream was designed to bypass unfriendly countries such as Poland and Ukraine, but dependent on Russian gas as it was, Germany backed the project. However, since the start of the Ukraine war, Germany has put a stop to further development of Nord Stream II.

In reply to the halt in supply, Poland in late May terminated its intergovernmental agreement with Russia to receive gas through the overland Yamal pipeline.

"Russia's aggression against Ukraine

has confirmed the accuracy of the Polish government's determination to become completely independent from Russian gas. We always knew that [Russian gas company] Gazprom was not a reliable partner," Anna Moskwa, Polish Climate Minister said.

With the exception of several gas pipelines to China, Russian gas exports via pipeline are directed to Europe. In order to boost gas exports, Russia has been building LNG capacity. But that sector is expected to face a number of hurdles in the future.

Important international oil companies such as Shell, ExxonMobil and TotalEnergies, which helped the Russian energy sector get up to speed in the 1990s, are now pulling out of Russia and the consequences of this could be long-lasting.

Russia is expected to have trouble with its LNG projects on Sakhalin Island in which ExxonMobil and Shell

are partners and in the Yamal Peninsula projects involving the private company Novatek and TotalEnergies.

International sanctions will leave the Russians without the technical expertise and financing that they need to get these projects up and running, especially with Novatek's Arctic LNG 2 plan. CEO Leonid Mikhelson recently acknowledged that sanctions were making it difficult for the project to carry on, but that Novatek was sticking to its commission dates. Arctic LNG 2, with a 19.8 million tons/year capacity was scheduled for start-up in 2023.

But observers say that Russia may soon have to shut down some of its gas production as it runs out of areas to store gas that is not exported. Shutdown would create a new set of problems for the gas industry, as it could be difficult to get aging infrastructure operating again.

# SMRs powering up to join the big beasts

Rendering of the GE Hitachi BWRX-300. GE Hitachi believes the 300 MW boiling water reactor can become the most cost-competitive SMR and the quickest to market. Source: GEH

Small Modular Reactors hold huge promise for low-carbon and low-cost energy and are attracting considerable interest as a result, with dozens of designs under development. Challenges remain, but momentum is building for a big nuclear success story. **Sam Curtis**

The twin drivers of climate change and energy security have resulted in renewed interest in nuclear technology. Alongside large conventional nuclear reactors though, a buzz is also growing around small modular reactors (SMRs), units that hold the promise of low cost, rapid installation and relatively straightforward development.

Like their larger cousins, SMRs are a low-carbon energy source and benefit from a largely secure supply chain but there are key differences too. Large conventional reactors are huge civil engineering projects, which can easily take a decade or more to build. In contrast, SMRs are much smaller in size and are largely factory built off-site and with limited on-site construction. This is one of the key gains of SMRs, which are delivered almost complete to their final destination for assembly. They also typically feature passive safety systems, minimising further even the remote risk of a reactor accident.

Furthermore, unlike full-scale nuclear units, the SMR concept is centred on production line-type manufacturing with a high degree of commercial off-the-shelf components further reducing production and installation costs. As a result, they hold the promise of a much more economically viable option than a conventional nuclear reactor. If SMRs are successfully deployed at scale, this approach is expected to cut the LCOE for nuclear capacity bringing it on a par with current renewables.

It's no surprise that the obvious advantages of the SMR concept have prompted a lot of attention and there are dozens of different designs of SMR currently under development. Among the leading technologies are products being developed by Rolls-Royce, GE Hitachi and NuScale.

Rolls-Royce, for example, is working up its 470 MW pressurised water reactor (PWR) design, which it claims will produce dependable energy for as little as £60/MWh (\$76/MWh) and potentially even cheaper if SMRs go into volume production. The Rolls-Royce design will provide 220-440 MW of power, depending on the configuration.

Meanwhile, GE Hitachi's BWRX-300 design is a 300 MW boiling water reactor with natural circulation cooling. It is based on GE's NRC-certified ESBWR design. GE Hitachi believes the BWRX-300 can become the most cost-competitive SMR and the quickest to market.

NuScale's SMR technology centres on a 77 MWe module, also a PWR

that is configured into a number of different-sized units, such as the VOYGR™-12 (924 MWe) featuring 12 so-called Power Modules. This is the world's first SMR design to receive US Nuclear Regulatory Commission (NRC) design approval.

Alongside the established energy market players new entrant OEMs are also piling into the SMR market. Nucleoeléctrica Argentina, for example, is developing the CAREM 32 MWe prototype SMR that is already under construction, with a bigger 100-200 MWe version on the horizon should trials prove successful.

With considerable interest and investment from vendors and OEMs, governments and policymakers are also investigating the possibilities of SMR technology as they try to map a route to net zero. In the UK for example, the government presented its British Energy Security Strategy document earlier this year, which emphasises the role of nuclear in the future energy mix and highlights the contribution from SMRs.

As part of a goal to reach 95 per cent of electricity from low-carbon sources by 2030 a significant acceleration of nuclear is envisaged. The UK has an ambition of up to 24 GW of new nuclear by 2050, meeting around 25 per cent of total electricity demand and SMRs forming a key part of the nuclear pipeline.

Great British Nuclear, a new government body, is already being set up to bring forward new projects, in part through the new £120 million (\$151 million) Future Nuclear Enabling Fund targeting barriers to entry. In addition, the Ten Point Plan for a Green Industrial Revolution announced an Advanced Nuclear Fund of up to £385 million to invest in the next generation of nuclear technologies. This specifically includes up to £215 million for SMRs and the development of a domestic design. A further £170 million is earmarked for a research and development programme to deliver an Advanced Modular Reactor (AMR) demonstration by the early 2030s. As part of the AMR programme the UK department of Business Energy and Industrial Strategy (BEIS) is providing up to £2.5 million in innovation funding to support the development and demonstration of High Temperature Gas Reactor (HTGR) technology in the UK.

Buoyed by government backing for SMRs, Rolls-Royce is leading a consortium including BNF Resources UK and Exelon Generation that is investing £195 million in SMR development over a three-year period. The consortium is also funded to the

tune of up to £210 million with a grant from the government's UK Research and Innovation (UKRI) through the Industrial Strategy Challenge Fund (ISCF) and the Low Cost Nuclear (LCN) challenge. Earlier this year the SMR design entered the Generic Design Assessment (GDA) process with regulators. The Office for Nuclear Regulation and the consortium is aiming to build 16 SMRs initially with the first planned in the early 2030s and as many as 10 by 2035.

Beyond the UK's shores, progress on SMRs has also been accelerating. Late last year GE Hitachi, BWXT Canada and Synthos Green Energy announced their intention to cooperate in deploying at least 10 BWRX-300 SMRs in Poland by the early 2030s. GE Hitachi has also been selected by Ontario Power Generation (OPG) to install a BWRX-300 at the Darlington New Nuclear Project that could be complete by 2028. They claim they can construct and operate a new nuclear plant in as little as 24-36 months.

With Fluor Corporation now a major investor, NuScale Power has also been working to implement its SMR design. It signed a contract with Polish mining company KGHM early this year, to implement SMRs in Poland with the first power plant operational by 2029. More recently, NuScale signed a Memorandum of Understanding (MOU) with Associated Electric Cooperative to evaluate its technology and this deal follows close behind a similar MOU with Korean investors GS Energy, Doosan, and Samsung.

China is also rapidly moving ahead with its SMR technology, the 125 MWe PWR ACP100 by China National Nuclear Corporation (CNNC). A key foundation slab for Linglong One at the Changjiang nuclear power plant on China's island province of Hainan has already been poured.

Despite the range of potential benefits and the considerable commercial interest in pursuing the technology, there are nonetheless some considerable challenges to be overcome if SMR ambitions are to be realised.

One of the key advantages of SMRs, i.e., manufacturing at scale, relies on significant and sustained market demand. While there clearly is demand, questions remain over whether the market is buoyant enough to achieve such economies of scale. In the UK, for example, there are just eight designated nuclear sites currently – Hinkley, Sizewell, Heysham, Hartlepool, Bradwell, Wylfa, Oldbury and

Moorside. The challenges of obtaining licensing agreements for other new sites cannot be over-estimated. And, while the economic case is strong at face value – SMRs being much smaller need far less upfront capital expenditure – the existence of multiple competing models could also dilute potential market value by reducing the available market for each specific design.

Nonetheless, as some SMRs can produce much higher temperatures than existing reactors, new market opportunities – in steel-making or hydrogen production for example – might present themselves.

New nuclear reactors also need to present an unimpeachable safety case. Evidence suggests that most SMRs will be considerably safer than current designs and in some cases the core technology is well proven. In Russia there are already SMR units installed on board floating power plants and many small reactors have been produced for marine propulsion, aboard submarines for example. In the US, NuScale's SMR has already been issued design certification by the NRC and thus meets safety requirements. However, for the vast bulk of designs there is the challenge of obtaining design and operating licences. Each national regulator has its own rules, increasing the risk that SMRs will not be able to secure approval in a timely way and at reasonable cost.

To address this concern the IAEA has launched the Nuclear Harmonization and Standardization Initiative (NHSI), which aims to develop common regulatory and industrial approaches to SMRs. Another issue to consider is waste disposal. While some designs can use existing routes developed for large reactors, others use novel fuels for which no such pathways currently exist. Although these issues can ultimately be addressed this could take considerable time and add further costs and risks.

Given the barriers to commercial deployment that remain for SMRs it's a big ask to see them rolled out at scale within the decade. It is certainly important that continued government support is available to help them build a sustainable market. However, SMRs could become an important tool in the battle to curb carbon emissions. Rolls-Royce estimates the size of the potential SMR market as around 65-85 GW worldwide by 2035, including 10 GW in the USA and China and 15 GW in China, it's a market valued at £250-£400 billion. The challenges of SMRs are there to be solved, but if that happens then the market is too.

# Elections will accelerate Asia's path to net zero

Australia, the Philippines, and South Korea have each held elections in the last three months. As 'influencers', given their size and level of development, the results add momentum to the region's energy transition and will enable faster capital mobilisation in the three energy markets.

**Joseph Jacobelli**

Elections, such as the recent ones in Australia, the Philippines, and South Korea, are crucial in the determination of the net zero emissions (NZE) path of a country. The first building block for a country to achieve an NZE objective is the establishment of policies, regulation, and institutions by its government.

Ideally the execution of these is efficient and effective. However, a country can still make good progress in its NZE path even in an environment where execution is weak. This is because it will send the right investment signals to industry participants, the capital markets, and others. Specifically, it is important to lower investment risk which usually also translates into a lower cost of capital – i.e., lower borrowing costs.

Australia, the Philippines, and South Korea are important actors in Asia's energy markets, though they have very different decarbonisation pathways. Their energy profile differences are quite striking. Australia has a relatively small population compared to its regional peers, with about 26 million people – half of South Korea's, which in turn is less than half that of the Philippines, as of 2020.

In terms of primary energy consumption, South Korea's is almost 12 EJ, versus Australia's 6 EJ and just 1.8 EJ for the Philippines. Looking at primary energy from non-fossil fuel sources as a percentage of the total primary energy, South Korea had the highest ratio with 15.4 per cent, the Philippines' was 11.5 per cent, and Australia's was just 10.4 per cent. This means that all three have a long path to decarbonise their market.

National elections were held in South Korea in March, and in the Philippines and Australia in May. The new leaders in Australia will reverse the country's climate change denial policies. Those in South Korea should broadly continue with the previous government's decarbonisation policy. For the Philippines, there is some hope that the new administration will adopt an NZE target soon.

Australia's new Prime Minister, Anthony Albanese, was sworn-in on May 23rd. His centre-left Labour Party has advocated for more robust climate change-related policies. Something that the former Prime Minister Scott Morrison's coalition government, led by the liberal party,

| (Data as of 2020)                           | Unit                 | Australia | Philippines | South Korea | Asia ex-China |
|---|----------------------|-----------|-------------|-------------|---------------|
| Population                                  | Million              | 25.7      | 109.6       | 51.8        | 2,726.8       |
|   | %                    | 0.9%      | 4.0%        | 1.9%        | 100.0%        |
| GDP   | Current US\$ Billion | 1,328     | 361         | 1,638       | 11,732        |
|   | %                    | 11.3%     | 3.1%        | 14.0%       | 100.0%        |
| Primary Energy Consumption                  | Exajoules            | 5.57      | 1.82        | 11.79       | 107.79        |
|   | %                    | 5.2%      | 1.7%        | 10.9%       | 100.0%        |
| Primary Energy Consumption, Fossil Fuels    | Exajoules            | 4.99      | 1.61        | 9.97        | 96.00         |
|   | %                    | 5.2%      | 1.7%        | 10.4%       | 100.0%        |
| Primary Energy Consumption, ex-Fossil Fuels | Exajoules            | 0.58      | 0.21        | 1.82        | 11.79         |
|   | %                    | 4.9%      | 1.8%        | 15.4%       | 100.0%        |
| Electricity Generation, Total               | Terawatt-Hours       | 265       | 102         | 574         | 5,140         |
|   | %                    | 5.2%      | 2.0%        | 11.2%       | 100.0%        |
| Electricity Generation, Clean Energy        | Terawatt-Hours       | 65        | n.a.        | 205         | 3,952         |
|   | %                    | 1.6%      | n.a.        | 5.2%        | 100.0%        |

**Australia, the Philippines and South Korea energy markets snapshot.**

Sources: World Bank; bp Statistical Review of World Energy 2021; Joseph Jacobelli

had been extremely weak on. For example, when Australia attended the 2021 United Nations Climate Change Conference (COP26) in Glasgow in November 2021, Lord Deben, Chairman of the UK Climate Change Committee, was one of many to publicly slam Australia's NZE plan.

Among other things, Morrison's NZE plan was betting on some new technological breakthroughs. Some experts have argued that the Albanese NZE strategy blueprint could be massively improved. Still, the new 'Powering Australia' plan, pledges to: create over 600 000 jobs; bring down household power bills; increase the share of renewables in the main power market, the National Electricity Market, to 82 per cent by 2030; and to reduce emissions by 43 per cent by 2030 to reach net zero by 2050.

Albanese is highly likely to succeed thanks to some pretty strong tail winds. Many state governments, such as those of New South Wales and Western Australia, have been staunch supporters of advancing investments in clean and sustainable energies. This has resulted in Australia looking at building some massive projects. One of the many examples is the InterContinental Energy's Asian Renewable Energy Hub (AREH) which will take 10 years and approximately

A\$36 billion (\$25.5 billion) to develop and will involve building wind and solar facilities of about 26 GW in Western Australia.

Just over two months before Albanese's election, South Korea's new President Yoon Suk-yeol was sworn in on March 8. President Yoon's political manifesto is generally more conservative than that of the nation's previous five-year, one-term President, Moon Jae-in. However, when it comes to taking the nation down the NZE path, President Yoon is likely to accelerate decarbonisation.

His new Environment Minister, Han Hwa-jin, has stated that the Yoon-government is committed to carbon neutrality. She also emphasised that the administration regards nuclear power generation as a green source of energy. This reverses former President Moon's rejection of nuclear energy. He had actually announced at the time of COP26 a phase-out plan for nuclear power in South Korea.

President Yoon's commitment to nuclear power as one of the tools to achieve decarbonisation will be reinforced by fossil fuel price volatility and supply chain disruptions prompted by Putin's war on Ukraine. So, energy supply security, which can be met by domestically generated clean energy sources, is even higher on the new administration's agenda; the country imports virtually all of the fossil fuels it consumes while nuclear power generation accounted for about 28 per cent of the total in 2020.

The Philippines, meanwhile, is somewhat of a laggard in NZE, especially when compared to the new momentum in Australia and South Korea. The Philippine Congress proclaimed Ferdinand 'Bongbong' Marcos Jr. as President-elect on May 25. He will replace President Rodrigo Duterte, whose six-year term ends in June; similar to South Korea, a President may only serve a single term. Duterte's climate action could be best described as minimalistic and its execution slow.

An example was the commitment to cut greenhouse gas emissions by 2030. President-elect Marcos has yet to present clear targets backed by a comprehensive climate action blueprint. However he sees environmental

protection as a high priority and has also shown to be keen on raising the amount of energy from clean sources.

He was quoted as saying: "We will use natural sources of energy. We will no longer use coal. We will no longer use fossil fuel. We should have alternative [sources of energy] and the renewables are [always] available." Albeit this was stated in January, early in the election campaign process. Importantly, he is pro-nuclear energy. He has mentioned that he hopes to restart work on a nuclear power plant which was going to be built under his father's administration, almost four decades ago. While nothing is on paper yet, there seems to be the possibility of momentum in climate action and energy transition.

Australia, the Philippines, and South Korea will gain new impetus in addressing decarbonisation and the energy transition. Australia's is likely to become one of the fastest in the region, as the country strives to change the perception that it is a climate action laggard by becoming a leader, at the very least in the Asia region. South Korea will continue its very robust NZE path, and possibly even accelerate a little. The Philippines is likely to formulate some kind of NZE plan in the coming months, or at the very least structure and execute policies accelerating the build out of clean energy in the country including onshore wind and solar as well as offshore wind and maybe even nuclear energy. Put together it is clear that the world's largest energy consuming and polluting region in the world is on a very steady path toward NZE. As such, Asia will continue to attract enormous amounts of capital in its clean energy buildout, including transport electrification.

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**Australia, the Philippines and South Korea country snapshot by The Climate Action Tracker.** Sources: Joseph Jacobelli based on data from The Climate Action Tracker ([climateactiontracker.org](http://climateactiontracker.org))

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|---|---|
|  | <p><b>Australia (23 May 2022)</b></p> <ul style="list-style-type: none"> <li>• Net zero target year: 2050</li> <li>• Overall rating: Highly insufficient</li> <li>• Comprehensiveness rated as: Poor</li> </ul>       |
|  | <p><b>Philippines</b></p> <ul style="list-style-type: none"> <li>• Net zero target year: Nil</li> <li>• Overall rating: Nil</li> <li>• Comprehensiveness rated as: Nil</li> </ul>                                     |
|  | <p><b>South Korea (8 March 2022)</b></p> <ul style="list-style-type: none"> <li>• Net zero target year: 2050</li> <li>• Overall rating: Highly insufficient</li> <li>• Comprehensiveness rated as: Average</li> </ul> |

# High voltage DC GIS for DolWin kappa

Almost ready to set sail:  
Topside of the Dolwin  
kappa converter station in  
the yard in Cádiz, Spain

The DolWin kappa converter platform is a key part of Germany's DolWin6 offshore wind farm interconnection project. Junior Isles visited the platform as it neared completion to take a first hand look at an installation, which for the first time features gas insulated switchgear for DC applications up to  $\pm 550$  kV.

Renewable energy and particularly offshore wind has long been seen as crucial to the European Union hitting its targets for carbon emissions. And since the eye-watering rise in gas prices, exacerbated by Russia's war against Ukraine, the importance of renewables has taken on even greater importance as a way of not only meeting net zero targets but also as a means of the bloc weaning itself off Russian gas.

Naturally, utilising the wind resource of the North Sea is a key part of Europe's strategy. The European Commission is aiming for 60 GW by 2030 and 300 GW 2050, and in February this year the European Parliament called for the current rate of deployment to be accelerated.

Along with the UK, Germany has in particular been looking to exploit offshore wind potential to meet its own net zero target by building offshore wind farms in the north and transporting that power down to the major load centres in the south. As of early 2022, there were about 1500 turbines with a capacity of nearly 7.8 GW in operation in German waters in the North Sea and Baltic Sea.

Going forward, the country plans to install 30 GW of offshore wind power by 2030, 40 GW by 2035, and 70 GW by 2045. Connecting this amount of offshore wind, however, is no small task. Since December 2006 the European grid operator, TenneT, has been legally obliged to connect all offshore wind farms in the German North Sea to the power grid.

By 2019, the cross-border transmission system operator (TSO) had already met and even significantly exceeded the Federal Government's expansion targets of 6.5 GW by 2020 for sustainable North Sea wind power: the 12 completed grid connections in the North Sea already transport more than 7 GW of renewable energy from sea to land. By 2027, TenneT will have completed four more offshore grid connections, thereby increasing transmission capacity to over 10 GW.

One of the most important of these connections, certainly in terms of power capacity and technology, is DolWin6. With a rating of 900 MW, along with BorWin 3, it is currently the largest of TenneT's connections.

The DolWin6 grid connection, scheduled for completion in 2023, is around 90 km in length and will connect multiple offshore wind turbines to the mainland. The 155 kV alternating current supplied by the wind turbines will be converted into 320 kV direct current on the DolWin6 offshore platform and transported to Hilgenriedersiel on the mainland via a 45 km subsea cable. On the ocean, the cable will pass underneath the island of Norderney by means of horizontal bore holes. Once on land, the electricity will be transported by another 45 km underground cable to Emden, East Frisia, where Siemens is building another converter station for converting the direct current back into three-phase current and feeding it into the high voltage grid.

The DolWin kappa converter platform, which is being built in the Dragados shipyard in Cádiz, Spain,



Dolwin kappa will see the first use of a  $\pm 320$  kV DC GIS

sits at the heart of the project. The platform utilises Siemens Energy's HVDC Plus technology to convert power from AC to DC. It is based around the Modular Multi-level Converter (MMC) for high voltage, high power voltage source converter (VSC) applications.

In Siemens Energy HVDC Plus systems, one modular multi-level converter comprises three single-phase inverters. One converter comprises three identical phase units with two converter arms, and each converter arm contains a number of sub-modules supporting the full DC voltage. Each sub-module contributes only a small voltage step and is controlled individually. Essentially, each module without an MMC is a discrete voltage source with a local capacitor to define its voltage step without creating ripple voltage distortion across the converter's other phases. This way, it is possible to achieve the required sinusoidal AC and smooth DC side output voltage waveforms without excessive harmonic distortion and HF noise.

The insulated-gate bipolar transistors (IGBTs) at the heart of the sub-modules are fully controllable. This enables modular multi-level converters to absorb and generate reactive power independently from active power up to the converter rating. The output currents can be varied over the complete operating range in a smooth, linear way. This enables independent and very flexible control of active and reactive power, which supports the connected AC grid.

The technology allows the converter platform to be more compact than its predecessors, leading to around a 10 per cent saving on investment cost.

Notably, DolWin kappa uses compact DC gas insulated switchgear (GIS). The new GIS for  $\pm 320$  kV requires up to 95 per cent less space compared to previous air-insulated switchgear (AIS) solutions. This was the main driver behind its development. By using this switchgear on an offshore platform, the size of the platform itself can be reduced by up to 10 per cent. While comparable

AIS in standard configuration would require 4000 m<sup>3</sup>, Siemens Energy's DC GIS requires only 200 m<sup>3</sup>.

DC GIS continually measure current and voltage. They also detect any failures and prevent hazardous events. According to Siemens Energy, the technology can operate for decades, even in harsh weather conditions.

According to Siemens Energy, this is the first time such a switchgear is being used on an offshore converter station. "This is the world's first offshore gas insulated switchgear. It is something we have developed over the last year for DC applications even up to  $\pm 550$  kV," said Dr Maria Kosse, HVDC Lead Engineer at Siemens Energy.

The DC GIS is based on Siemens Energy's well-proven AC GIS technology, which has been supplemented with a newly developed DC insulator. Under DC voltage, the insulators are exposed to a different electric field than under AC voltage due to the phenomenon of field transition accompanied by charge accumulation at interfaces. Siemens, therefore had to develop a new DC insulator capable of handling these DC-specific aspects.

Dr Kosse explained: "Compared to AC GIS, the DC GIS gas-solid insulating system is exposed to an electrostatic field at the time of energisation, followed by a field transition to an electric flow field. The resulting field distribution under DC voltage is strongly influenced by several factors, such as the materials used and their temperature- and field-dependent conductivities or additional charge carriers from voltage-dependent sources. In view of the related physical characteristics, safe DC GIS operation requires the selection of appropriate materials for reliable electric field control."

The technology has been several years in the making, with the whole development process being accompanied by continuous short- and long-term testing. The first DC GIS generation for  $\pm 320$  kV projects was fully type-tested in 2015. The type tests for the second generation for

voltages up to  $\pm 550$  kV were carried out in 2018 and 2019 in Berlin and Munich, including third-party witnessing. All performed tests have been passed.

The type tests have been performed in accordance with relevant IEC standards of AC GIS and DC-specific recommendation of CIGRE joint working group D1/B3.57, finally published as technical brochure no. 842.

DolWin kappa was the ideal project for the first commercial use of the technology. Timing-wise, the design phase for DolWin kappa exactly matched the finalised product development of the first DC GIS generation. Hence, the new product was immediately integrated into the design in order to reduce the overall size of the converter platform.

The DC GIS modules for DolWin kappa have been pre-tested in the switchgear factory in Berlin. After transport to the yard in Cádiz and final assembly of the transport units in the platform, the DC GIS has been successfully commissioned including high-voltage testing. It is now ready for sail-out in summer this year.

The commissioning of this system next year will be a milestone in Siemens Energy's rollout of the DC GIS technology. The next will be for the BorWin 5 offshore project, Germany, which is scheduled to go live in 2025. At 230 km, this will be the longest offshore DC connection to date.

Looking forward, future development of the technology will see the elimination of carbon emissions from high voltage DC GIS. Following a successful feasibility study, the product development for what Siemens Energy calls 'Blue' DC GIS for voltages up to  $\pm 550$  kV was kicked-off at the start of this year.

Dr Kosse concluded: "Siemens Energy's vision to achieve carbon neutrality includes utilising clean air, a pure mixture of nitrogen and oxygen, as the most sustainable insulating gas with zero global warming potential. In the future, the DC GIS will be F-gas-free."



Junior Isles

# There's more to lightning than speed

“Let’s dash into renewables at lightning speed”, was the rallying cry from European Commission VP for the European Green Deal, Frans Timmermans, as the Commission first outlined REPowerEU – a plan to make Europe independent from Russian fossil fuels well before 2030. Now, a little over two months later, the Commission has provided greater detail on what that plan entails.

Certainly the EU needs to move at warp speed as Russia cuts off gas and/or electricity supplies to EU countries one-by-one. But doing so at the necessary pace will be far easier said than done.

Progress does not come without struggle and its way is neither swift nor easy but the EU is, by and large, taking the right approach.

Mark Zuckerberg once said: “... if you do the things that are easier first, you can actually make a lot of progress.” It is heartening to see that, with energy savings being the quickest and cheapest way to address the current

energy crisis, and reduce bills, the Commission has at least not missed this trick.

REPowerEU proposes to enhance long-term energy efficiency measures, including an increase from 9 per cent to 13 per cent of the binding Energy Efficiency Target under the ‘Fit for 55’ package of European Green Deal legislation. “Saving energy now will help us to prepare for the potential challenges of next winter,” the Commission stated.

The Commission has therefore also published an ‘EU Save Energy Communication’ detailing short-term behavioural changes that could cut gas and oil demand by 5 per cent and encouraging Member States to start communication campaigns targeting households and industry. The EU’s executive arm also sets out contingency measures in case of severe supply disruption, and will issue guidance on prioritisation criteria for customers and facilitate a coordinated EU demand reduction plan. Through

its ‘EU Save Energy Communication’ Member States are also encouraged to use fiscal measures to encourage energy savings, such as reduced VAT rates on energy efficient heating systems, building insulation and appliances and products.

But that is where the quick and easy(ish) tasks end.

The REPowerEU strategy calls for a “massive scaling-up and speeding-up” of renewable energy in power generation, industry, buildings and transport to accelerate the bloc’s energy independence, give a boost to the green transition, and reduce prices over time. The Commission proposes to increase the headline 2030 target for renewables from 40 per cent to 45 per cent under the ‘Fit for 55’ package.

In the long term, the EU executive aims for solar and wind energy to produce 66 per cent of the system’s electricity by 2050, doubling the rate from the current 33 per cent. Within this framework, the aim is for wind to account for 31 per cent of the EU’s energy production capacity and the bulk, 35 per cent, to come from solar energy.

It says that setting this overall increased ambition will create the framework for other initiatives, including: a dedicated EU Solar Strategy to double solar photovoltaic capacity by 2025 and install 600 GW by 2030; a Solar Rooftop Initiative with a phased-in legal obligation to install solar panels on new public and commercial buildings and new residential buildings; doubling of the rate of deployment of heat pumps, and measures to integrate geothermal and solar thermal energy in modernised district and communal heating systems; and a Commission Recommendation to tackle slow and complex permitting for major renewable projects, and a targeted amendment to the Renewable Energy Directive to recognise renewable energy as an overriding public interest. It said dedicated ‘go-to’ areas for renewables should be put in place by Member States with shortened and simplified permitting processes in areas with lower environmental risks.

Gerben Hieminga, ING’s Senior Sector Economist, however, points to what he sees as several “pinch points” in the strategy, especially the rapid acceleration of renewables.

While improving the permitting procedure helps developers, it is important to remember that there also has to be buy-in from communities. “While co-creation might increase local support, it is not a guarantee that processes will speed up. And local opposition could easily increase as the transition accelerates and regional sceneries change faster than people are willing to accept,” said Hieminga.

Power grids will also be a limiting factor. Reacting to the REPowerEU announcement, European grid operator TenneT stressed that the ambitious national and international renewable energy targets requires offshore wind developers, policy-makers and grid operators to “intensify and accelerate their cooperation”. It also highlighted the huge challenge for offshore wind power, noting that the whole supply chain needs to be prepared for the coming growth.

Speaking at the recent North Sea Wind Summit in Esbjerg, Denmark, where Commission President Ursula

von der Leyen presented the REPowerEU package to Heads of State from the four North Sea countries, TenneT’s CEO Manon van Beek, said: “The REPowerEU package sets important steps shortening and simplifying permitting processes for the deployment of renewable energy. Grid infrastructure projects should benefit from the same acceleration rules as renewable energy projects.”

Hieminga believes power grids are likely to remain a persistent barrier. “Phasing out fossil fuels increases power demand, and on the supply side, renewables cause peak supplies at times when the sun shines and the wind blows,” he said. “In many cases, we’re reaching capacity limits on transporting power over the grid. Governments are still a long way from designing a clear rulebook to allocate scarce capacity. It remains to be seen if it will come soon, as it requires tough choices between economic activities.”

Labour and material shortages should also not be overlooked. Noting that the transition is very labour intensive, he said electricians, welders, installers, etc., are “very hard to find”. These issues, he stressed, “could get far worse if the transition needs to progress at ‘lightning speed’ and the war in Ukraine continues”.

But perhaps the biggest pinch point with the EU’s overall plan to wean itself off Russian fossil fuels, is the limited ability of renewables to meet heat demand.

“Too often, the energy transition is framed in terms of solar and wind power as a solution to everything,” said Hieminga. “But power demand only makes up one-fifth of total energy demand. The vast majority of energy demand comes from heating purposes. Solar and wind power cannot make much of a difference here as power electrons are far from a perfect substitute for gas molecules. Such examples always make me realise that the real challenge is in transforming heating demand, not power demand. REHeatingEU would have been a better name instead.”

It is an important point, one that has to some extent been addressed in the new strategy. REPowerEU builds on the ambitious heat pump targets it set out in March. Those targets require around 20 million heat pumps to be installed in the EU by 2026 and nearly 60 million by 2030. The European Commission now aims to double the deployment rate.

Arguably more is needed, at least in terms of overall strategy to help the sector deliver on the targets.

Thomas Nowak, the European Heat Pump Association’s secretary-general, said: “Today the EU Commission set out many good jigsaw pieces but did not shape a consistent picture on heating and cooling. Europe needs a heat pump strategy and the industry an EU heat pump accelerator to speed up deployment and help Europeans get off fossil gas faster. Since today’s package does not address this need, we invite interested groups to join us in co-creating it, hoping that its core aspects will be taken up in forthcoming policy.”

Clearly there is plenty work to be done and at daunting speed. But perhaps any forthcoming policy not only needs to be framed in terms of ‘the speed of lightning’ but should also give thought to ‘the heat of lightning’.

