THE ENERGY INDUSTRY TIMES

April 2022 • Volume 15 • No 2 • Published monthly • ISSN 1757-7365 www.teitimes.com

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EU outlines plan to cut dependence on Russian gas

Ursula von der Leyen, President of the European Commission

The EU has set out its plan to cut reliance on Russian gas, as the scramble to replace the shortfall begins. **Junior Isles**

The European Union has set out its plan to end its reliance on Russian fossil fuels by 2027. In its REPowerEU communiqué issued last month, the bloc promised to take urgent action on energy prices and at the same time listed a raft of measures that would notably cut its dependence on Russian gas by two-thirds this year.

The European Commission stated: "In recent months Europe has been facing high and volatile energy prices. After Russia's unprecedented military attack on Ukraine, security of supply concerns exacerbate the situation."

In order to provide companies and households with affordable, secure and clean energy, the Commission said it would start "immediately with price mitigation and storing gas for next winter".

Measures to end dependence on fossil fuels include: more rooftop solar, heat pumps and energy savings; decarbonising industry through electrification and renewable hydrogen; speeding up renewables permitting; doubling ambition on biomethane; accelerating development of a hydrogen infrastructure; and diversifying gas supplies.

Commenting on the communiqué, Executive Vice-President for the European Green Deal, Frans Timmermans said: "It is time we tackle our vulnerabilities and rapidly become more independent in our energy choices. Let's dash into renewable energy at lightning speed. Renewables are a cheap, clean, and potentially endless source of energy and instead of funding the fossil fuel industry elsewhere, they create jobs here."

The Commission's strategy was guided by a 10-Point Plan set out by the International Energy Agency (IEA) a week earlier, just after the agency agreed to release over 60 million barrels of oil (2 million barrels/day for 30 days) from its emergency reserves.

Announcing the 10-Point Plan, IEA Executive Director Fatih Birol, said: "Nobody is under any illusions anymore. Russia's use of its natural gas resources as an economic and political weapon show Europe needs to act quickly to be ready to face considerable uncertainty over Russian gas supplies next winter."

According to the Paris-based agency, in 2021 the European Union imported 155 billion cubic metres (bcm) of natural gas from Russia, accounting for around 45 per cent of EU gas imports and close to 40 per cent of its total gas consumption. It said the EU could reduce its imports of Russian natural gas by more than one-third, or more than 50 bcm, within a year through a combination of measures that would be consistent with the European Green Deal and support energy security and affordability.

Many of the actions recommended

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Reducing dependency on Russia weakens argument for gas as transition fuel

The rising geopolitical risk related to fossil fuels in light of Russia's invasion of Ukraine and the relative price parity of renewable energy, makes the argument for using gas as a transition fuel weaker, according to experts.

As the EU Commission announced plans to cut Russian gas imports by two thirds this year, while rapidly scaling up renewables and energy efficiency measures, several industry observers argued that the ongoing crisis has shown that depending on gas as the world moves to renewables, threatens the resilience of energy systems.

Raphaël Hanoteaux, Senior Policy Advisor on Gas Politics at think-tank E3G, said: "The question of energy security is gradually transforming into a question for resilience rather than just security. The most economically healthy way to do this is through energy efficiency, and renewables. The European Commission is acknowledging this and the potential of the EU Green Deal to solve a number of these problems. Gas is a political fuel. We are only at the beginning of the political implications of what is going on, especially for the European agenda."

Europe's rapid scale-up of the clean energy transition has been motivated by a need to ensure energy security for consumers, who have been exposed to volatile price hikes as a result of over-reliance on oil and gas.

Others have also called for a decrease in the reliance on fossil fuels in light of current events.

"The Russian invasion of Ukraine calls for a reshaping of our European energy policy. We need now an accelerated expansion of renewable sources of energy to bring about energy autonomy and security in Europe," said the European Parliament Rapporteur for renewable energy, Markus Pieper.

WindEurope, meanwhile, welcomed the European Commission's objective to completely end Russian fossil fuel imports before the end of the decade. The organisation noted that wind energy is "home grown and cheaper" than imported fossil fuels. "Every wind farm contributes to making Europe less reliant on fossil fuel imports," it said.

The EU wants wind energy to be 50 per cent of its electricity by 2050. This means expanding onshore wind from 173 GW today to 1000 GW and offshore wind from 16 GW to 300 GW. The Commission suggests that another 30 GW of wind energy, on top of the 450 GW that its decarbonisation scenarios foresee, could be deployed by the end of 2030.

Crucially, all of this depends on permitting. The European Commission acknowledges the fundamental need to simplify the permitting of new renewable energy projects. Improving permitting is "a matter of urgency" to Europe's energy transition.

"Long and overly complex permitting procedures are the main bottleneck to the expansion of wind energy," WindEurope said in a statement. "The EU is currently building only around half of the new wind farms that it needs to build to deliver its 40 per cent renewable energy target," it stated. The European Commission will present Guidance to National Governments on how to improve permitting in May 2022.

"More than ever Europe now needs to tap into its massive wind energy resources. Speeding up the growth of wind is central to achieving energy security. And we need to do it with European technology," said Giles Dickson, WindEurope CEO. "Europe must do everything to preserve our world-leading wind energy supply chain. Accelerate permitting. Have smarter wind auctions that factor in wind energy's contributions to a robust, resilient and circular economy. And boost research and development",

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in the plan – including stepping up energy efficiency measures, accelerating renewable deployment and expanding low emissions sources of power system flexibility – are key elements of the IEA's Roadmap to Net Zero by 2050.

Significantly, the IEA also recommended maximising power generation from bioenergy and nuclear, a move that could reduce gas use by 13 bcm within a year. Birol said that countries should perhaps "revisit" decisions to close nuclear plants.

The top two items on the IEA's plan, however, were: not signing and new gas contracts with Russia; and replacing Russian supplies with gas from alternative sources. Securing alternative sources, it said, increases non-Russian gas supply by around 30 bcm within a year. The IEA says this could come from the likes of Algeria, Azerbaijan, Qatar and the US.

In an important development near the end of March, the US and the EU signed a trans-Atlantic agreement for the US to increase its LNG exports to the EU by at least 15 bcm by the end of this year. The Commission said it would "work towards ensuring approximately 50 bcm/annum stable demand for additional US LNG until at least 2030".

Patterson says "we need to see fuel switching when it comes to power generation..."

As the EU scrambled for gas elsewhere, ING Head of Commodities Strategy Warren Patterson noted: "While there is some flexibility in LNG supply, the key constraint for Europe at the moment is the limited amount of regasification capacity. We estimate that under a best-case scenario Europe could increase LNG imports by around 68 bcm from 2021 levels. This is still far short of the 155 bcm which was imported from Russia last year.

"When we take into consideration domestic production increasing by 14 bcm from Norway, the Netherlands and the UK, along with increased pipeline flows from non-Russian sources of 4 bcm, Europe will only be able to meet around 55 per cent of Russian pipeline flows. Therefore, we would need to see fuel switching when it comes to power generation, along with the potential for demand destruction from other users in order to ensure adequate supply."

Kateryna Filippenko, principal analyst on Wood Mackenzie's Europe gas and LNG team said: "Additional supply options include increased imports from Norway and Algeria, as well as higher production from Groningen – these could bring an additional 15 bcm in April-October. Europe can also try to persuade Asian buyers to use more coal, which would free up more LNG into Europe – as much as 15 bcm between April and October."

She said, however, that even if Europe is successful in brokering all its options it is inevitable that the region will face demand curtailments through winter 2022-2023.

Energy crisis puts spotlight on the nuclear option

- Finland, Spain and UK seek nuclear extensions, as former eastern bloc countries bet on new plants
- Germany will not reverse nuclear closures

Junior Isles

Nuclear power is looking increasingly attractive as several European countries look to reduce their dependency on imports against a backdrop of soaring gas prices and the threat of losing gas supply from Russia.

Following France's decision in February to invest in new nuclear, the Spanish Nuclear Society (SNE) called for a review of the nuclear shutdown schedule in Spain.

"It is essential to have an energy mix that allows us to be as independent and sustainable as possible. The reality is that nuclear and renewables complement each other and are the perfect combination to be independent, competitive and sustainable," said Héctor Dominguis, President of the SNE.

More recently, in a move to bolster its energy security the UK government recently said it plans to take a 20 per cent stake in the new Sizewell C plant being built by EDF. The government is also looking at a 20-year extension of Sizewell B that would see it operate to 2055.

The announcements came as the start-up of Finland's long awaited Olkiluoto 3 nuclear power plant finally began supplying power to the grid on March 12th – more than a decade after the original start-up date. The 1600 MW reactor marks Europe's first EPR and Finland's first nuclear power plant in more than 40 years.

Following its start-up, Finnish energy company Fortum announced that it has applied for a new operating licence for both units at its Loviisa nuclear power plant until the end of 2050.

Former Eastern block countries are also placing their bets on nuclear. In mid-March Czech Prime Minister Petr Fiala gave the go-ahead for a new nuclear power plant alongside an existing reactor.

"We want to take a further step towards energy independence," Fiala said, noting that Russia's attack on Ukraine showed just how important this goal was.

The construction of the reactor in Dukovany, in the south of the country, is estimated to cost at least €6 billion ($6.65 billion).

US' Westinghouse, France's EDF and Korea's KHNP – have passed a Czech government security appraisal and are expected to bid for the lucrative project. Russian and Chinese suppliers are effectively excluded from bidding following a change of law.

Latvia's Prime Minster Krisjanis Karins also said the state must seriously consider switching to nuclear energy in the future.

Hungary, meanwhile, says it will not scrap the expansion of its Paks power plant, which be executed by Russia's Rosatom.

It was thought that Germany, which depends on Russia for more than half of its gas, might reconsider its plan to close its remaining three reactors by the end of this year. The government, however, ruled out the move, saying it was "not advisable even in light of the current gas crisis".

A report from the economy and environment ministries said keeping the plants running would not help tackle a crunch at the end of this year, when demand will be highest, and would only see electricity supplies rise "from autumn 2023 at the soonest". It stated that increased output from nuclear sites would "barely substitute" the need for gas, which is used to heat businesses and homes as well as for generating electricity.

An extension would face significant administrative hurdles and would need to last a "minimum three-to-five years", the report said.

Citing concerns about the preparation for the shutdown having progressed so far, the government said keeping them on line would cause "security concerns of the highest magnitude" . Robert Habeck, Vice Chancellor and Minister for the Economy and Climate Action also added that "fission fuel supplies had not been secured yet".

Countries accelerate disconnection from Russian grid

The Baltic states have agreed to complete their network de-synchronisation from the Russian power grid and synchronise with European networks before 2025, the Economics Ministry's Parliamentary Secretary Ilze Indriksone (National Alliance) told the Saeima Public Expenditure and Audit Committee.

The states had already planned to disconnect the BRELL grid, which connects Latvia, Lithuania and Estonia with Russia, in 2025 but will now not wait. Indriksone indicated that an agreement has been reached with Estonia and Lithuania that the synchronisation project can be implemented earlier.

Economics Minister Janis Vitenbergs (National Alliance) has also asked Europe to support the plan so the solutions can be introduced sooner, the parliamentary secretary told lawmakers.

According to Indriksone, speeding up the de-synchronisation from Russia's transmission system will require additional financing but that this is an opportunity to ensure more secure electricity supply now.

The decision came as engineers connected Ukraine to a power grid spanning much of continental Europe, allowing the former Soviet republic to decouple from hostile Russia.

ENTSO-E, which represents dozens of transmission system operators in Europe and is based in Belgium, said the power grids of Ukraine and its small neighbour Moldova were effectively synchronised with the Continental European Power System on a trial basis.

"This is a significant milestone for the Continental Europe TSOs working in collaboration with Ukrenergo and Moldelectrica," the group said. Grid operators had been preparing the move after Russia annexed Crimea in 2014, but Russia's military assault on Ukraine forced Kiyiv to make an emergency request to expedite a process that was expected to take more years to complete.

Ukraine and Moldova were formerly part of the Integrated Electricity System that includes Russia and Belarus. This made Ukraine dependent on Russia's grid operator even though there was no electricity trade between the two countries for years.

Georg Zachmann of the Brussels-based think-tank Bruegel said that the change would allow electricity suppliers on the continental grid stretching from Portugal to Poland to supply power to Ukraine if needed. This would allow Ukraine to shut down some of the thermoelectric plants it keeps running to ensure grid stability and save valuable fuel in these wartime times, he added.

Global carbon dioxide emissions rise to all-time high

Global carbon dioxide emissions (CO_2) rose to their highest ever level in 2021, as a 6 per cent increase in 2021 pushed emissions to 36.3 Gt, erasing the 5 per cent reduction in 2020 because of the Covid-19 pandemic.

According to new analysis by the International Energy Agency (IEA), the increase in CO_2 emissions of over 2 billion tonnes, caused by rebounding energy demand, was the largest in history in absolute terms.

Coal accounted for over 40 per cent of the overall growth in carbon emissions in 2021, reaching an all-time high of 15.3 billion tonnes. CO_2 emissions from natural gas rebounded well above their 2019 levels to 7.5 billion tonnes. At 10.7 billion tonnes, emissions from oil remained significantly below pre-pandemic levels because of the limited recovery in global transport activity in 2021.

The use of coal for electricity generation in 2021 was intensified by record high natural gas prices. Gas-to-coal switching pushed up global CO_2 emissions from electricity generation by well over 100 million tonnes, notably in the US and Europe where competition between gas and coal power plants is tightest.

Despite the rebound in coal use, renewable energy sources and nuclear power provided a higher share of global electricity generation than coal in 2021. Renewables-based generation reached an all-time high, exceeding 8000 TWh in 2021, a record 500 TWh above its 2020 level. Output from wind and solar PV increased by 270 TWh and 170 TWh, respectively, while hydropower generation declined due to the impacts of drought, notably in the US and Brazil.

In a separate report, 'Mind the Gap: How Carbon Dioxide Removals Must Complement Deep Decarbonisation to Keep 1.5°C Alive', the Energy Transitions Commission (ETC), said carbon dioxide removals – through, for example by reforestation, engineered solutions such as direct air capture of CO_2 and bioenergy plus carbon capture and storage – alongside rapid and deep global decarbonisation are needed to give the world a 50/50 chance of limiting global warming to 1.5°C.

Adair Turner, Chair of the ETC, said: "It's not either or – deep decarbonisation or carbon dioxide removals. Both are essential, rapidly and at scale."

Brazil's wind ambitions attract global and European players

- Shell aims at 6 GW offshore to become largest player
- European Investment Bank loans underwrite 700 MW of onshore capacity

Janet Wood

Shell is seeking to develop six offshore wind projects totalling 17 GW in the seas off Brazil and has applied for environmental investigation licences for the new sites from the Institute for the Environment and Natural Resources (IBAMA), Brazil.

If all the projected capacity is realised it will make Shell the country's largest offshore wind player, overtaking Ventos do Atlantico's 15 GW at five projects.

Shell has asked the Brazilian government to undertake an Environmental Impact Assessment (EIA) and the studies are expected to begin this year.

Gabriela Oliveira, Manager of Shell Renewable Generation Brazil, said: "With more than 20 years of experience in wind energy worldwide and more than 50 years of tradition in offshore projects, Shell intends to combine its expertise on these two fronts with the aim of providing more energy and clean energy to the country."

The offshore sector is of huge interest in Brazil; the country has 47 potential offshore wind farm sites but just one has moved off the drawing board. The Ministry of Mines and Energy (MME), Government of Brazil, issued a Decree in January to regulate the contracting of areas for wind energy development. The Ministry of Mines and Energy is now in charge of carrying out the necessary studies, selecting offshore wind zones and organising auctions for the leases available.

Elbia Gannoum, CEO of the Brazilian Wind Energy Association, said: "I have no doubt that, in some short years' time, we will be celebrating our first gigawatts of wind energy in the Brazilian seas, and that Brazil, which has some of the best winds in the world for onshore, will be also known for the success of offshore wind – one of the most essential in the world's struggle to limit dangerous climate change."

Onshore, wind and solar continues to attract investment. Brazilian utility Neoenergia SA – a subsidiary of Spain's Iberdrola – recently received a €200 million loan from the European Investment Bank (EIB) to finance wind and solar projects in the country.

The EIB said recently that it would provide the utility with funding to support 566.5 MW of wind and 149 MW of solar photovoltaic (PV).

EIB Vice President Ricardo Mourinho Felix, said: "Today's announcement highlights EIB priorities in Brazil and Latin America, supporting a sustainable and inclusive economic growth by boosting productive investment."

Canada invests in Westinghouse's micro nuclear reactor

Canada has announced new investment of $27.2 million in Westinghouse Electric Canada Inc. to support the company's next-generation 'small modular reactor' (SMR), the eVinci micro-reactor. The investment will cover around half the $57 million cost of ensuring the reactor can be licensed in Canada.

The government of Canada sees the design, which also as an opportunity for communities to move on from using diesel engines. It also hopes to create more than 200 jobs in Canada's energy sector.

The financial contribution is being made through the Strategic Innovation Fund's Net Zero Accelerator initiative. The new funding is the fund's third investment in SMR technologies, after the government supported projects at Terrestrial Energy and Moltex Energy.

Eddie Saab, President, Westinghouse Electric Canada, said: "Westinghouse is proud to be advancing Canada's net-zero 2050 goals with our eVinci micro-reactor technology. Our innovative battery technology will bring safe, carbon-free and transportable energy to industries and communities all across Canada."

The Honourable Jonathan Wilkinson, Minister of Natural Resources, said: "Canada must rapidly develop and deploy low-carbon energy technologies in order to meet our environmental and economic objectives. Small modular reactors provide an opportunity to generate non-emitting energy for communities while attracting investments in Canadian businesses and creating jobs for Canadian workers."

US fossil plants under new pressure over smokestack emissions

Federal restrictions on emissions that affect neighbouring states are back on the agenda, after the US Environmental Protection Agency proposed a new plan that would restrict smokestack emissions from power plants and other industrial sources.

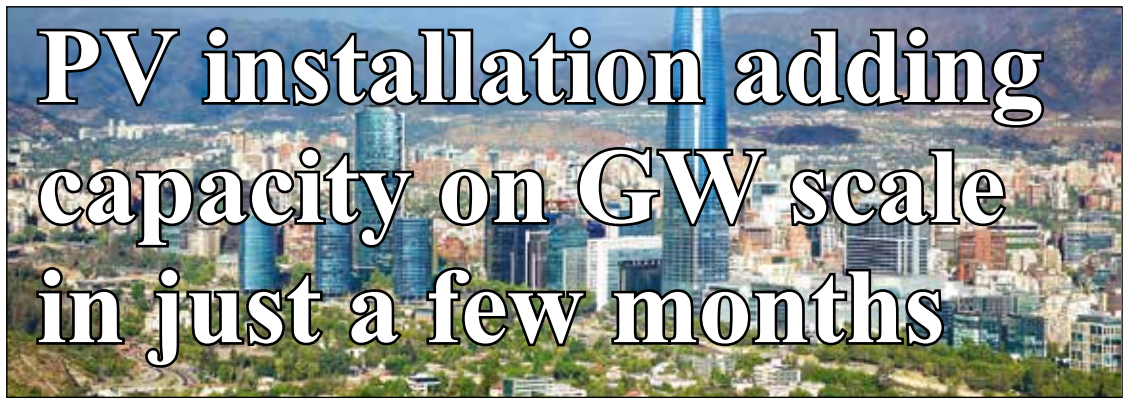
States have to submit plans to the EPA to ensure coal fired power plants and other industrial sites do not add significantly to air pollution in other states. The new federal plan would apply where the state plans have been rejected or where states have not submitted a plan.

The measure dates back to a 2015 rule set by the EPA. The Trump administration moved to weaken the rule, but recently the EPA under President Joe Biden said it was restoring pollution controls on power plants and industrial sites.

"Air pollution doesn't stop at the state line," said EPA Administrator Michael Regan.

The proposed update "will encourage more power plants to invest in clean, affordable zero-emitting power, which will help more upwind states be 'good neighbours' as the Clean Air Act requires," said Graham McCahan, a senior attorney for the Environmental Defense Fund.

The EPA proposal would affect power plants starting next year and industrial sources in 2026.



- US industry highlights capacity construction outpacing nuclear
- Chile PV array tops 240 MW

The US installed a record 23.6 GW of solar photovoltaic (PV) capacity in 2021, 19 per cent more than in 2020. That represented 46 per cent of all new electricity capacity in the US last year, bringing the total installed solar to 121.4 GW, according to the 'US Solar Market Insight 2021 Year in Review' report from Wood Mackenzie and the Solar Energy Industries Association. Solar generated 3.9 per cent of US electricity in 2021.

The industry contrasted the monthly installation of around 2.4 GW with two reactors at the Vogtle nuclear plant in Georgia, which total 2.2 G W and have been under construction since 2013 with no final completion date.

However, the authors warned of "headwinds" that could check market growth. That included stalled federal legislation that would renew tax credits and provide other support. If incentives in the Build Back Better Act were enacted in some form it would boost installations by 66 per cent in the next decade, they said.

"The supply chain constraints of the last year will hit 2022 installations the hardest, reducing capacity by 7 per cent compared to 2021," commented Michelle Davis, principal analyst at Wood Mackenzie and lead author of the report.

Logistics challenges and trade issues were also blamed, along with measures in individual states such as net metering changes planned in California and Florida.

The report said many projects slated for completion in the fourth quarter had been delayed to 2022.

Texas had the fastest growing solar portfolio – it added more than 6 GW of overall solar capacity last year. It overtook California, which installed 3.6 GW over the year, as the leading state for solar capacity additions.

Meanwhile in Chile, Atlas Renewable Energy has announced the opening of the Sol del Desierto solar plant. The huge 244 MW array, on a 479 Ha site, is expected to generate 714 GWh annually and it has a long-term power purchase agreement with Engie Energía Chile.

Alfredo Solar, Engie's general manager for Chile, said: "… Sol del Desierto stands out not only for its contribution to clean energy but also for the care of the surrounding nature, the conservation of archaeological sites, and above all for having placed special focus on the inclusion of female workforce in its construction."

Central US states follow wind and solar route to future capacity

American Electric Power subsidiary Indiana Michigan Power (I&M) has acted on its Powering the Next Tomorrow integrated resource plan, which was submitted to state utility regulatory commissions in both Indiana and Michigan earlier in 2022. The company has issued a request for proposals (RFP) for 800 MW of wind power and 500 MW of solar power.

I&M already operates five solar farms and purchases power from four Indiana wind farms.

The new solar farms must be in Indiana or Michigan, but the wind projects can also be in neighbouring Illinois or Ohio. I&M wants all the capacity to be online by the end of 2025.

Dave Lucas, I&M Vice President for Regulatory and Finance, said, "These new resources will combine with I&M's existing generation to provide an even more diversified and flexible generation portfolio that will stabilise energy costs over time, stimulate economic growth, reduce emissions and take advantage of new technologies."

Bidders can submit proposals that incorporate battery storage, emerging technologies and other resources.

I&M plans to sign contracts with the successful developers by the end of 2022.

Australia wind efforts blow strong

■ Victoria sets target for offshore wind ■ Grid connection permit for country's largest onshore wind farm

Syed Ali

The government of the Australian state of Victoria has outlined the country's first offshore wind targets, as the country looks to take advantage of its significant wind resources and supercharge efforts to lower emissions from its power sector.

The Australian state of Victoria plans to deploy 9 GW by 2040 through a series of targets with first power targeted as early as 2028. Under the ambitious plan, Victoria has set targets of 2 GW by 2030, 4 GW by 2035, and 9 GW by 2040. Australia, which is heavily reliant on coal fired power, has 7.4 GW of onshore wind power but currently has no offshore wind. Notably, this will be the first time anywhere in Australia that a minimum target has been set for offshore wind power.

Victoria, the first state to propose an offshore wind project, has legislated that by 2030, 50 per cent of its electricity must come from renewables.

"Victoria's offshore wind resources are officially open for business, but the real work starts now," said Minister for Energy, Environment and Climate Change Lily D'Ambrosio.

The government plans consultation on the design of the offshore wind programme, which is set to start this month.

The proposed Leeuwin wind complex off the coast of Western Australia, and led by Copenhagen Infrastructure Partners, looks set to be the first of the new projects. Last month Danish firm Copenhagen Energy laid out plans for the construction of the 3 GW offshore wind park with up to 200 turbines. The capacity will likely be installed in phases, with construction of the first one expected to start as early as 2026 and take 36 months, ending in 2028.

Once up and running, the Leeuwin park is expected to produce up to 11 TWh of electricity per year.

The project proponent noted that the scheme is still in the early development stage and many of its detailed design parameters are yet to be determined. At this point, its plan is to use wind turbines of between 15 MW and 25 MW each.

Meanwhile, the country is continuing to scale-up its onshore wind as it moves to cut dependence on coal.

At the end of February Iberdrola Renewables Australia agreed to build the 145 MW Flyers Creek wind farm in New South Wales. In mid-March an agreement was signed to connect the 1 GW MacIntyre Wind Precinct to the Queensland grid. The project, which will be Australia's largest wind farm, consists of two wind farms – the 923 MW MacIntyre wind farm being developed by Acciona Energia and the 102 MW Karara wind farm, which will be built, owned and operated by Queensland's publicly owned clean energy firm CleanCo.

Australia's burgeoning wind sector is proving to be a magnet for international energy companies.

Oil and gas conglomerate Shell Plc recently announced it will buy a 49 per cent stake in WestWind Energy. The new investment is part of Shell's plan to develop a low-carbon power generation business in Australia.

Shell Energy Operations wants to develop a 3 GW portfolio in Australia and the projects will be developed across the states of Victoria, New South Wales and Queensland.

■ Coal miners and power station workers who lose their jobs as Australia ends fossil fuels would be paid half their wage by taxpayers for a decade under a $19 billion Greens proposal. Under the plan, thermal coal mine and domestic coal power generation workers wages would be immediately eligible for the subsidy scheme from July 2022, while metallurgical, also known as "coking" coal workers would be able to cash in on the payment from 2030. The staggered eligibility dates follow the Greens' plan to phase Australia out of thermal coal by 2030, and metallurgical coal in 2040.

Japan banks on renewables to cut energy imports

Japan will aim to speed up the start of operations of some new offshore wind power plants, as Russia's invasion of Ukraine has pushed the resource-poor nation to review its high energy dependence on imports.

The government said in March that permission criteria for businesses bidding to use marine areas to generate offshore wind power will be reviewed so companies that can start sooner rather than later will be more highly evaluated.

Russia accounted for 3.6 per cent of Japanese crude oil imports, and 8.8 per cent of its liquefied natural gas imports in 2021, according to data from the Japan External Trade Organization. Prime Minister Fumio Kishida has said that ensuring stable energy supplies is a "national interest".

"Following the situation in Ukraine, we are facing an urgent need to accelerate the introduction of renewable energy as a home-grown energy source toward decarbonisation. This is also vital in terms of ensuring energy security," Industry Minister Koichi Hagiuda told a press conference.

Last October, the government approved its energy plan, a road map toward a goal of carbon neutrality by 2050, positioning offshore wind power as a driving force of renewable energy.

Japan aims to expand offshore wind energy capacity to 10 GW by 2030 and 30-45 GW by 2040, according to the Ministry of Economy, Trade and Industry (METI). Project areas for offshore floating wind will be put to auction for interested companies to submit their proposals.

In December, a group led by trading house Mitsubishi Corp. won the right to use three marine areas, near Tokyo and in northeastern Japan, with its plan of supplying power at low prices highly rated. The group aims to start business in 2028.

Under the energy plan, Japan has set a target of making renewables account for 36 to 38 per cent of total domestic power generation capacity in fiscal 2030, more than twice as much as the 18 per cent recorded in fiscal 2019 that ended in March 2020.

The news came as Mainstream Renewable Power and Aker Offshore Wind closed a transaction, announced in August 2021, that will see them take an initial 50 per cent stake in Progression Energy's 800 MW floating offshore wind project in Japan.

Japan is also promoting solar. Last month it allocated 268.7 MW of solar capacity in its 11th auction for utility-scale photovoltaic (PV) projects. The tender saw bids decline further from previous calls and reached as low as Yen8.99 ($0.078/kWh).

The tender results released by Japan's Green Investment Promotion Organisation show that 273 projects were successful in the competitive round. A total of 345 proposals were made with a combined capacity of 278.6 MW.

The weighted average price of the winning bids came at Yen 9.99 per kWh, declining from Yen 10.31/kWh in the previous call. The tender was capped at Yen10.25/kWh.

The tender targeted solar PV projects larger than 250 kW. It was the last one awarding fixed tariffs.

■ A 7.4-magnitude earthquake forced Tokyo Electric Power Company (Tepco) to call on businesses and residents to limit their use of electricity last month in order to avoid a widespread blackout. The blackout alert, issued by the Ministry of Economy, Trade and Industry, was the first of its type since a system was installed in the aftermath of the 2011 Tohoku quake that caused the meltdown at the Fukushima nuclear power station. Following the earthquake, 6.5 GW thermal power plants including large-size coal and gas plants were shut down. This led to blackouts for 2.2 million households.

Philippines eyes nuclear revival

Syed Ali

The Philippines says it will develop a nuclear power programme to include nuclear power in its electricity mix, as it prepares to phase out of coal fired generation. Philippines President Rodrigo Duterte signed Executive Order (EO) 164 approving the programme at the end of February as part of a policy to ensure affordable electricity in a country that regularly suffers power outages.

Authorities expect nuclear energy to help meet the Philippines' increasing energy demand, with the country projected to require an additional 68 GW by 2040.

"The national government commits to the introduction of nuclear power energy into the State's energy mix for power generation," the Order said. "The State envisions nuclear power as a viable alternative base load power source along with alternative energy resources, to address the projected decline of coal fired power plants."

Coal is the main source of electricity in the Philippines, accounting for more than half of the country's power generation.

In July 2020, Duterte ordered the creation of an inter-agency body to review the existing legal framework, study the viability of nuclear energy, and recommend the necessary steps in utilising nuclear energy and existing facilities, particularly the Bataan Nuclear Power Plant (BNPP).

The new order now directs the inter-agency panel to look into reopening BNPP, the country's first and only power plant built in 1986. The plant was never used and was mothballed due to safety concerns following the nuclear disaster at Chernobyl Nuclear Power Plant in Ukraine in April 1986.

Panfilo "Ping" Lacson and Senate President Vicente "Tito" Sotto III expressed their support for the Order detailing the country's nuclear policy. "Nuclear energy is the cheapest, but we haven't harnessed it yet. Our main consideration there is safety, because we are on the earthquake belt and all that," Lacson said in a statement

Several groups, including Greenpeace Philippines and local think-tank Center for Energy, Ecology and Development (CEED) believe that nuclear power will do more harm than good to Filipinos. In a previous statement, Greenpeace demanded that the Duterte administration revoke the EO, saying that the policy is not aligned with the Filipino people's interests, after calling nuclear as the "most dangerous and most expensive" source of electricity.

Following the Order, on March 10th the Philippines and the US signed a Memorandum of Understanding on Strategic Civil Nuclear Cooperation (NCMOU) to further deepen the cooperation between the two countries in developing the Philippines' nuclear energy programme.

■ Prestige Power Resources Inc. (PPRI), a subsidiary of SMC Global, is planning to put up a 600 MW LNG combined cycle power plant in Leyte, based on a filing with the Department of Environment and Natural Resources. It is currently in the process of pre-engineering works and environmental compliance certificate application.

Vietnam to scale back solar plans to lower share in energy mix

The solar power capacity planned by Vietnam for 2031-2045 is "too high" and should be reduced to give space for wind power, the government has said.

In a communiqué issued by the Government Office, Deputy Prime Minister Le Van Thanh said the capacity for solar power set in the Power Development Master Plan VIII for the 2021-2030 period with vision until 2045 was "too high."

As proposed by the Ministry of Industry and Trade on February 21st, the national power capacity from now until 2030 would be 146 000 MW, 9000 MW less than the plan announced last November.

By 2045, the planned capacity would be 352 000 MW. In the 2031-2045 period, solar power will make up 25 per cent of the total power capacity, the ministry said. Deputy PM Thanh said this proportion of solar was too high and should be lowered, while that of offshore wind power should be increased.

According to state-owned Vietnam Electricity (EVN), as of 2021, Vietnam was among the top 10 countries with the highest solar power capacity at 16 504 MW, accounting for 2.3 per cent worldwide.

The Ministry of Industry and Trade submitted the first draft of the Power Development Master Plan VIII to the government in March last year. Since then the plan has been revised four times.

The ministry has asked that the plan's implementation be deferred to the second quarter of this year.

The Ministry of Industry and Trade (MoIT) has also asked provinces and centrally-run cities to review wind, solar and hydropower projects included in the national planning scheme for electricity development for 2011-2020 with a vision towards 2030.

Under a document recently sent to the provincial and municipal People's Committees, the ministry ordered a look-back at the projects, including operational ones and those that have yet to be put into use as of February 2022.

For the operational projects, the provincial and municipal People's Committees should evaluate their operations, and take note of difficulties facing them (if any), according to the document.

For those that have yet to be put into operation, the provincial and municipal People's Committees need to provide updates on the project progress, along with obstacles regarding land, technical infrastructure and finance, and propose solutions to them.

Statistics by the MoIT showed that between March 2016 and the end of 2020, 384 projects had been added to the planning scheme, including 190 wind power projects with a combined capacity of 11 921 MW, and 175 solar power projects with 15 400 MW.

Between 2011 and 31 October 2021, 84 wind power projects were put into commercial operation with a total capacity of 3980 MW.

Bangladesh achieves nationwide electricity coverage

Bangladesh has entered a new era by attaining 100 per cent electricity coverage in the country, with the inauguration of the country's first 1320 MW ultra-supercritical coal fired power plant.

Work on the Chinese funded mega power plant located in Payra in Patuakhali district, some 204 km south of the capital Dhaka, began in March 2016.

Inaugurating the project, Bangladeshi Prime Minister Sheikh Hasina said: "This is the biggest thing, that we've been able to light houses of every person."

The good news comes as concerns rise around potential problems facing a Russian-backed nuclear power plant.

Bangladesh signed a $12.65 billion credit deal with Russia in 2015 for the construction of two units of the plant at Rooppur in Pabna's Iswardi.

Nearly 25 000 local and foreign workers, engineers and experts are working at the 62 000 acre site. The government expects the experimental power supply to the national grid from the Rooppur Nuclear Power Plant's first 1200MW unit to begin next year.

It is feared, however, that sanctions against Russia following its invasion of Ukraine could hurt the project.

Russia's state development bank Vnesheconombank, or VEB, has been targeted by the US sanctions. VEB is involved in financing the Rooppur plant, so the tough economic measures could directly impact project transactions.

"If the bank needs to pay Russian suppliers for us and we get the services and machines, and the machines arrive properly, it may not affect Rooppur much," said economist Zahid Hussain.

"But if financial transactions [between Bangladesh and Russia] need to be done, we won't be able to do it in US dollars, euros, pounds or yen. If it is done in (Russian currency) rouble, what will we do? No one other than Russia will accept roubles," he said.

He believes Russia will face problems in producing and transporting the necessary equipment. "The sanctions are crippling Russia's economy. There'll be problems if they cannot manufacture the equipment necessary for the plant. And even if they make the equipment, there will be sanctions on transit routes, shipping."

The World Bank's former lead economist at its Dhaka office, Zahid pointed out that Russia will not be able to buy many high-tech goods from the US and Europe.

The Executive Director at the Policy Research Institute, Ahsan H Mansur thinks the large-scale economic sanctions will "certainly" disrupt Rooppur and Bangladesh's trade.

In an email response for comments, Rosatom told *bdnews24.com*: "No disruption is foreseen in any of the commitments and work schedules in the construction of the Rooppur Nuclear Power Plant."

Storage development moves to encompass new timeframes and technologies

- Batteries remain popular to fulfil several grid roles
- Hydrogen interest grows as EU steps up ambition

Janet Wood

Fast-moving investment in renewables in Europe has driven recent investment towards energy storage in different time horizons, sizes and energy vectors.

Recent investment in batteries show they remain the lead options for storage used to perform one of several grid functions.

The UK for example has recently seen two new 50 MW installations announced by EDF Energy's Pivot Power, which aims to use the projects to help roll out electric vehicle charging facilities. Meanwhile Centrica Business Solutions has announced plans for a 30 MW battery in Aberdeenshire that will be located near a connection for North Sea offshore wind farms and will store power from them to help manage network constraints.

However recent developments have extended storage research to investigate longer duration storage than the one to four hours offered by batteries.

The UK government recently awarded €8 million of funding to demonstration projects in the Longer Duration Energy Storage Demonstration competition. The 24 projects include thermal batteries, vanadium flow batteries, and thermal and compressed air energy storage technology. "Driving forward energy storage technologies will be vital in our transition towards cheap, clean and secure renewable energy," said Energy and Climate Change Minister Greg Hands.

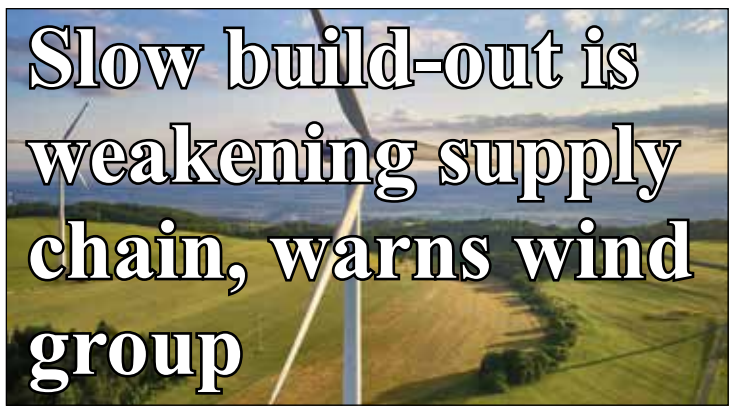
As regards storage for multi-season or multi-year timescales, hydrogen vectors are seen as the most promising route and the UK funding included demonstration projects for hydrogen production and for so-called 'Power-to-X', where green hydrogen produced by electrolysers will be stored in underground salt caverns for use in transport and to replace natural gas in fuel blending trials.

Similarly, Norway recently announced plans to invest some €20 million in HYDROGENi, a new centre for energy research in hydrogen and ammonia.

"Hydrogen is a prerequisite for the energy transition globally, in Europe and in Norway. It will add strategic autonomy to the energy system, a highly relevant topic in Europe today. Hydrogen can make the energy system more resilient, but also help us achieve our net zero target by 2050," said Alexandra Bech Gjørv, CEO of research organisation SINTEF.

In March the European Commission announced it would double the European Union's hydrogen production target and underlined the need to enhance EU manufacturing capabilities of equipment such as electrolysers.

In response the European Clean Hydrogen Alliance called for project promoters among its members to present projects to the European Investment Bank (EIB). The EIB has already provided over €550 million in direct financial support related to hydrogen technologies.



Slow build-out is weakening supply chain, warns wind group

WindEurope has written to European Commission President Ursula von der Leyen to warn over the "poor health" of the European wind energy industry. The group's recently published Annual Statistics show that the EU built only 11 GW of new wind farms in 2021.

A planned step-up to 18 GW a year to 2026 will be too slow, says WindEurope, and instead the EU needs to reach 30 GW a year of new wind to meet its 2030 targets.

"These low volumes undermine the Green Deal. And they're hurting Europe's wind energy supply chain," said WindEurope CEO Giles Dickson.

The group said the main bottleneck is permitting – almost none of the Member States meet the deadlines for permitting procedures required in the EU Renewable Energy Directive.

In the letter, WindEurope says the low volumes of permitted projects are affecting Europe's wind turbine manufacturers and wider supply chain. This has come at a time when the industry is also grappling with disrupted international supply chains and higher prices for steel and other commodities.

"The European wind industry is losing money, closing factories and shedding jobs – just when it should be growing to meet the huge expansion of wind power Europe wants. If this continues, the Green Deal is in trouble, not to mention Europe's energy security goals", said Giles Dickson.

Helsinki suburbs to be heated by data centre waste heat

Fortum and Microsoft have announced a collaboration in which Fortum will capture the excess heat generated from a new Microsoft 'data centre region' in Helsinki, Finland, in a local district heating system. The waste heat recycling concept from the data centre region is claimed to be the largest of its kind in the world.

The data centre site was chosen with waste heat recycling in mind. The project will make use of 900 km of underground pipes that transfer heat to 250 000 users in the cities of Espoo and Kauniainen and the municipality of Kirkkonummi.

Fortum has collaborated with the local cities and municipalities for several years in order to pave the way for these investments.

Markus Rauramo, President and CEO of Fortum said: "Sometimes the most sustainable solutions are simple ones: by tapping into waste heat from data centres, we can provide clean heat for homes, businesses and public buildings."

Once the new data centre region's waste heat capture is in operation, it will provide about 60 per cent of the area's heating.

"The decision to invest in a data centre that also provides surplus heat to our cities and homes is a win-win," said Sanna Marin, Prime Minister of Finland.

Offshore wind takes key role in Europe

- MEPs call for faster permitting
- New areas opened to wind farms

Offshore wind is set to be a key technology in reducing Europe's dependence on fossil fuel and particularly imports from Russia.

MEPs in the European Parliament noted that the cost of offshore wind fell by 48 per cent between 2010 and 2020. They recently adopted a report that called for faster deployment of offshore renewables, as they complained that many member states are lagging behind in deployment. They called for streamlined permitting procedures.

As MEPs were indicating their support for offshore wind, the first wind turbines in the Mediterranean Sea began to appear on the Italian coast. The ten-turbine site is offshore of Taranto in Puglia, an area already known for its steel mills.

Developer Renexia has follow-up projects planned, including a floating farm of 190 wind turbines off Sicily. "This is a great opportunity for us to change our minds about renewable energy," said local environmental advocate Fabio Matacchiera, in response to claims that the new wind farms would be unsightly.

Prime Minister Mario Draghi recently announced that "Accelerated investment in renewable energy (...) is the only long-term strategy", and promised to bring forward "several dozen gigawatts of offshore wind power". Italy's Ministry of Ecological Transition has received 64 proposals for offshore wind farms, but most remain stuck in development because the bureaucracy is too "cumbersome", according to WindEurope.

Meanwhile Portugal plans to organise an auction for 3-4 GW of floating offshore wind this summer. The projects are due to enter operation in 2026. The country's first floating wind farm, the 25 MW Windfloat Atlantic, has been operational since July 2020. It follows an Industrial Strategy for Ocean Renewable Energies published in 2017, which said the potential for offshore wind installation in Portugal is much more significant for floating turbines (40 GW), than for fixed ones (up to 3.5 GW).

Germany has also recently launched a new tender for a wind farm at a new 98 MW site in the North Sea, the Federal Network Agency said recently. It is aiming to commission the wind farm by 2027. The tender supports Germany's ambition to boost its offshore wind capacity to at least 30 GW at the end of the decade and to more than 70 GW by 2045.

Seabed users clash as wind farms and carbon storage conflict

Ørsted and BP have clashed over future use of the seabed in areas offshore of the UK. Both want to use the same areas for different purposes. Ørsted plans to site its 2.6 GW Hornsea Four offshore wind farm in the disputed area while BP and the Northern Endurance Partnership wants to use it for carbon dioxide (CO_2) transport and storage.

Ørsted says BP wants to exclude turbines from the so-called Overlap Zone "rather than focus upon mitigating the impact of either project upon the other", in contravention of an agreement dating back to 2013. BP, however, argues that the mitigation proposed by Ørsted is "unspecified and undeliverable".

The comments have come as plans for Hornsea Four are being considered for development consent. Ørsted says the Overlap Zone will cut the project area by a quarter, reducing the wind farm capacity. If the turbines are located too far south part, wake losses will also reduce output.

An Ørsted spokesperson said: "We have been working closely with BP to highlight and discuss the various options available. We're confident that an agreement can be reached to allow both projects to move forward. However, the issue of co-location has been brought into sharp focus and it's essential that a solution is found."

Nigeria's government pledges action after grid collapse

Government airs plans to improve grid management, upgrade gas power plants and develop nuclear power in the aftermath of grid crash outrage. **Nadia Weekes** reports

The Nigerian government has announced plans to improve the country's electricity supply after the national electricity grid crashed following the loss of 1100 MW from a 3700 MW peak generation capacity in mid-March.

At 1pm on March 14th a grid operations report disclosed that the system was yet to pick up load as just three Generation Companies (GenCos) were trying to restart but were yet to generate any energy, according to local press reports.

Of the active 25 GenCos on the grid, 19 were producing power as of 6 am, when the grid had nearly 3900 MW of capacity. This dropped to 2761 MW by 10 am after six GenCos went down.

The affected plants include the 447 MW Azura-Edo IPP (gas) and the 300 MW Shiroro hydropower plant.

The situation occurred less than a day after the GenCos through the Association of Power Generation Companies (APGC) raised the alarm over inefficient grid management and accruing debt in the electricity market.

They said some of the GenCos' turbines now have technical faults due to the inefficiency, while the debts have limited their ability to pay for more gas-to-power.

The Minister of Power, Abubakar Aliyu, said that the grid collapse was a direct consequence of the failure of a 330 kV transmission line. He said the government had upgraded three gas power plants and was feeding gas to others to raise output.

Aliyu added that the government had also directed the Nigerian Bulk Electricity Trading Plc (NBET) to begin negotiations with Nigerian Agip Oil Company (NAOC) to connect the new Okpai power plant to the grid, adding another 400 MW of generation capacity. Aliyu said the recent outage was also linked to poor maintenance and shortage of gas.

"In order to optimise the capacity utilisation of the power plants owned by the Niger Delta Power Holding Company Ltd (NDPHC), the Nigerian Electricity Regulatory Commission has approved a special gas pricing for emergency contracting of gas from the Nigerian Gas Marketing Company Ltd," he said, adding that the NDPHC plants were expected to add some 800 MW of capacity.

"We wish to reassure all electricity consumers that all relevant agencies involved in the restoration of normality in power supply have been charged to act in the context of the emergency state of the industry," Aliyu added.

The government has opened bids for the construction of nuclear power plants that would provide 4000 MW of capacity, making a significant contribution to boosting the country's generation capacity, according to Dr Yau Idris, Director General of the Nigerian Nuclear Regulatory Authority (NNRA).

Idris said the NNRA had signed agreements with Russia, Pakistan, France and South Korea to train staff to adequately maintain the nuclear plants.

Ifeoluwa Oyedele, Executive Director of Niger Delta Power Holding Company (NDPHC), said the power generation companies could only release about 5000 MW into the national grid due to a lack of infrastructure for transmission and distribution to end-users. He said his company was looking at supplying power directly to end-users through power purchase agreements with industrial clusters across the country. Access to electricity is essential to accelerate Nigeria's economic growth, Oyedele added.

CESI to masterplan Oman's power grid upgrade

Italy-headquartered engineering and consultancy firm CESI has been commissioned by Oman Electricity Transmission Company (OETC), the country's monopoly provider of transmission services, to masterplan the development of Oman's interconnected power grid over the next two decades.

OETC's vision includes the rollout of an integrated transmission system that covers vast expanses of the country earmarked for renewable and green energy development, according to CESI.

OETC, a member of Nama Group, owns and operates the Main Interconnected System (MIS) covering much of the northern half of the country, as well as serving parts of the Dhofar Governorate. As system operator, it is also responsible for the central dispatch of generating and desalination plants connected to the two grids.

A major interconnection project called RABT is currently underway and will result, when completed in around 2026, in the integration of the MIS and Dhofar grids, resulting in reduced energy generation costs, savings in greenhouse gas emissions, improved energy efficiency and enhanced energy security.

Under its remit to update OETC's transmission system master plan to 2040, CESI said it will seek to "define the best technical-economic options for the long-term development of the transmission system".

The consultancy firm, which has been active in the Sultanate of Oman's electricity sector, said the study is an integral part of the country's strategic bid to embrace renewable resources to help decarbonise the economy.

CESI has already delivered consulting services on the integration of renewable energy in Oman, especially to ensure the security and reliability of supply.

Over the past two years, state-backed energy companies have unveiled green hydrogen projects relying on up to 30 GW of renewable energy capacity. Vast expanses of Al Wusta and Dhofar governorates are proposed to be prepped for investments in massive solar and wind farms, from which green electricity will be transmitted via a robust and dependable interconnected grid system operated by OETC.

Global lithium-ion battery capacity to rise five-fold by 2030

- Battery demand outstripping supply until 2023
- Lithium-ion battery capacity to grow five-fold by 2030

Global cumulative lithium-ion battery capacity could rise five-fold to 5500 GWh between 2021 and 2030, according to a new report by research company Wood Mackenzie, with demand likely to outstrip supply in the short term.

With high oil prices supporting the rollout of zero-emission transport policies and the electric vehicle (EV) market now accounting for almost 80 per cent of lithium-ion battery use, demand is set to skyrocket, said Wood Mackenzie consultant Jiayue Zheng.

"The lithium-ion battery market already encountered shortages last year due to thriving EV market demand and rising raw material prices," Zheng said. "Under our base case scenario, we project that battery supply will not meet demand until 2023."

Global battery manufacturers are responding with massive expansion plans, with Chinese manufacturers alone planning to build more than 3000 GWh of capacity. The top 15 manufacturers by planned capacity put into operation a total of about 200 GWh in 2021, and cumulative capacity reached 600 GWh.

The Asia Pacific region, led by China, accounted for 90 per cent of the world's battery manufacturing in 2021. By the end of the decade, the region is expected to reduce its share to 69 per cent, however.

While North America's cell capacity is expected to expand ten-fold by 2030, it will lag behind Europe, which will account for more than 20 per cent of global capacity by 2030 through more rapid expansion.

Wood Mackenzie also forecasts lithium iron phosphate (LFP) batteries' market share to surpass nickel-cobalt-manganese (NCM) batteries' in 2028.

Historically, the EV and energy storage system markets have mostly deployed NCM batteries given their availability and maturity, but LFP batteries' competitive cost, long life cycle and high safety performance make them an attractive option for both power and energy applications.

Russia close to agreement on nuclear deal with Iran

Iran and Russia have signalled they are close to agreeing the final points of a "new inter-state agreement" that will pave the way for a nuclear deal removing Iran from ongoing sanctions in exchange for sending spent nuclear fuel to Russia.

Amid growing tension due to Russia's invasion of Ukraine, Moscow confirmed in March that the US had agreed to remove sanctions from Iranian oil sales. Russian Foreign Minister Sergei Lavrov said the deal was moving forward, while a US State Department spokesperson said the US would not sanction Russian participation in nuclear projects that have already been agreed. The US would not, however, "provide assurances beyond that to Russia", the spokesperson added.

The inter-state agreement between Iran and Russia is likely to accelerate the accession of Iran to the Eurasian Economic Union (EEU), solidifying Russia's economic interests in Iran. Iran has been in a preferential trade agreement with Russia since 2018, which has increased bilateral trade.

Lavrov noted that the agreement between the EEU and Iran would benefit both nations. "In 2021, it [trade] increased by almost 80 per cent exceeding $4 billion," he said. "Russia and Iran are waiting for even more impressive prospects," he added.

In a separate development, Iran's Deputy Energy Minister Homayoun Haeri said his country wants to connect to the European electricity network through Azerbaijan and Russia, and that studies were underway in that regard. "At the same time, discussions are underway with the countries around the Persian Gulf on the connection of the electricity network via submarine cable," Haeri noted.

Iran's electricity exchange capacity with its neighbours is said to be 2000-3000 MW at present. It is hoped that will reach 10 000 MW by 2023.

Corporations "put values before profit" over Russia

- Oil and gas majors exit Russian operation
- Ørsted finds it trickier to completely cut ties

Junior Isles

Corporations in the power and energy sector are putting moral and social values ahead of profit, as they cut ties with Russia following President Putin's invasion of Ukraine.

International oil and gas majors were among the first to move with BP deciding to sell its stake in Russian state-owned oil company Rosneft, quickly followed by Shell, which said it would end all of its joint ventures with the Russian energy company Gazprom. Exxon Mobil has also said it will exit all of its Russia oil and gas operations.

Sustainability consultant, Neil Gaught, co-founder of Single Organizing Idea, said the moves prove unequivocally that "profit does not, and should not, come before values and doing the right thing".

He noted that decisions to exit Russian ventures will undoubtedly impact the businesses, profits and subsequently, their shareholders but said it shows that huge shifts can be made by even the largest companies when they are given no choice, and they can be done quickly.

"This is likely to be a pivotal moment for the big oil & gas firms. It proves that change is possible and presents an opportunity to take stock, review other areas of the business and take a long hard look at where the company is going – whether that path is truly sustainable," said Gaught.

Siemens Gamesa (SG) has also decided to halt "for the time being" its commercial activity in Russia, where it has no wind turbine component factories. The wind power group condemned the invasion of Ukraine and called on the country to "put an immediate end to its hostilities".

The wind turbine manufacturer, now headed by Jochen Eickholt, says its activity in Russia is "limited", adding that it will continue to analyse the potential impact of the conflict on its business "as the situation is constantly changing".

Finnish power company Fortum and its subsidiary Uniper, meanwhile, are suspending investment in new projects. Fortum and Uniper have12 power plants in Russia with a combined power generation capacity of 15.5 GW and heat production capacity of 10.2 GW.

The Russian generating assets and the exposure in the Nord Stream 2 pipeline project carry a book value of approximately €5.5 billion.

Denmark's Ørsted, however, is finding it difficult to completely pull back from Russia. The green power major has taken measures to cease cooperation with Russian companies but is unable to sever ties with local businesses due to a long-term gas supply contract with a subsidiary of state-owned PJSC Gazprom.

The company said that it is no longer procuring biomass and coal for its power plants from Russia and does not have Russian companies among its direct suppliers for the renewables operations. Ørsted has also decided not to enter into new business with Russian firms.

The company says that the decision will not affect its financial targets or investment plans for this year.

Companies accelerate hydrogen investments

Interest in hydrogen continues to gather pace as companies continue to invest and make strategic tie-ups in the nascent green technology sector.

At the start of March MAN Energy Solutions said that it will invest up to €500 million in its subsidiary H-TEC SYSTEMS to transform the hydrogen specialist into a mass-producer of PEM (polymer electrolyt membrane) electrolysers as quickly as possible.

"Our plan is clear," explained Uwe Lauber, CEO of MAN Energy Solutions. "We are transforming H-TEC SYSTEMS into one of the world's leading players in the field of PEM electrolysis.

"Over the next five to ten years, green hydrogen will become one of the most important primary energy sources for the global economy as it continues to decarbonise.

"With PEM electrolysis, H-TEC SYSTEMS has mastered one of the most important processes for industrially scaled hydrogen production from renewable energy sources. The technology is mature and has already been placed on the market successfully. The next step is therefore to scale and set up highly automated serial production – and we would like to make rapid progress with this."

Companies have also been investing in the end-use part of the hydrogen chain.

Also in March, UK-based Ceres, a developer of electrochemical technologies and Horiba Mira, a European automotive engineering and testing consultancy, confirmed a long-term agreement to expand the UK's delivery of new fuel cell and hydrogen technology at scale to international markets.

The multi-million-pound agreement will see the development of a new state-of-the-art 240 m^2 test facility at Horiba Mira's headquarters, along with additional agreements to develop next-generation testing infrastructure to support Ceres' core technology and system development.

Meanwhile, in late February engineering group Worley Ltd, automation technology company ABB Ltd and tech group IBM signed a memorandum of understanding to collaborate on developing an integrated, digitally enabled solution for deploying green hydrogen assets.

The partnership seeks to enable faster, cheaper and safer construction, as well as more efficient operation of such assets, contributing to their wider market adoption.

"By fast-tracking and standardising how we engineer-design-operate, this collaboration is expected to reduce the levelised cost of green hydrogen and help our customers to decarbonise their operations further," said Chris Gill, Senior Vice President of low-carbon hydrogen at Worley.

The collaboration will combine Worley's engineering, procurement and construction expertise, ABB's offerings for electrical infrastructure, automation, operations digitalisation and energy management, and IBM's systems integration services and data management solutions. The companies will together provide operations and maintenance services.

E.On to focus on supply security and affordability in short-term

German energy major, E.On says it will focus on ensuring supply security and affordability in the short-term, while reducing energy dependence and dramatically expand hydrogen and renewables in the long term

At the company's annual results press conference last month CEO Leonhard Birnbaum condemned the war in Ukraine and emphasized that E.On is not only providing millions in short-term humanitarian aid, but was also taking responsibility for jointly shaping Europe's future energy supply.

"The war is painful evidence that Europe faces the long-term task of reducing its dependence on Russian energy. But there are answers as well. Europe needs to diversify its energy imports. This includes LNG as well as hydrogen. And Europe needs to move forward even more resolutely with its green energy transition."

In the meantime, he said the goal is to maintain energy security for the next two years. "We also have to ensure the affordability of energy – for households as well as for industry. There are no easy solutions, nor can Germany afford to take an ethically purist position if it doesn't want to jeopardize its industrial base and economy. That's why I welcome the German government's prudent approach."

The company said its business continued to perform well in 2021 despite a turbulent market environment and the second year of the Covid pandemic.

E.On increased Group adjusted EBITDA by a significant €1 billion to €7.9 billion. One growth driver was the Customer Solutions segment, which grew its EBITDA by 45 per cent to €1.5 billion, owing in part to the successful restructuring of its UK business. The Energy Infrastructure Solutions unit, whose EBITDA increased by 40 per cent year-on-year to €480 million, is becoming an increasingly key growth business.

The Future Energy Home unit, whose offerings include solar panels and battery storage devices, likewise experienced increased demand: the number of installed devices increased from 100 000 to 125 000 in a single year. Group earnings were also positively affected by Non-Core Business: particularly high-capacity utilisation of power plants and the current price level on the sales side made a contribution, especially in the fourth quarter. Earnings at Energy Networks mainly reflected positive weather conditions, the absence of negative effects from the pandemic, and anticipated regulatory developments at the network business in Germany.

The earnings impact of the increasingly extreme situation on energy markets in the second half of 2021 was "manageable", it said.

Dewa IPO to kick-off Dubai privatisations

Dubai Electricity and Water Authority (Dewa) Dubai's state-owned water and power utility has announced its intention of going public with an initial public offering. The public offer is part of a wider plan announced last November to list 10 state industries on the stock market to boost Dubai's profile and raise new capital for the emirate.

In its intention to float statement, Dewa said it would offer 3.25 billion shares, or 6.5 per cent of its share capital, in what could be one of the largest listings ever in the emirate. Officials and bankers have previously said the listing could value Dewa at around Dh100 billion ($27.2 billion).

"This is a historical moment for Dewa as the first government entity in Dubai to go public," said Saeed Mohammed Al Tayer, Managing Director and CEO of Dewa. "Dubai's fast paced development has resulted in a rapid increase in the demand for electricity and water. And Dewa has grown along with Dubai's expanding economy, population and world-class competitive infrastructure." Electricity demand grew 11 per cent in 2021, ahead of the forecast 4 per cent, he said.

Dewa said there was "substantial" interest in the flotation and doubted that increased volatility in markets worldwide as a result of Russia's war on Ukraine would derail its plans.

Americas

Vestas wins 86 MW Argentinian turbine order

Vestas has won an order from Petroquimica Comodoro Rivadavia (PCR) to supply 86 MW of turbines for two wind power projects in Argentina. The order includes a 30-year Active Output Management 5000 service agreement.

Turbine delivery will take place in the first quarter of 2023 and should be fully commissioned by the end of that year.

Martin Brandi, CEO of PCR, said that Vestas and PCR have already built 330 MW in Argentina.

Vestas said that this new order gives it a 50 per cent marker share of wind turbines in the country.

Mining company order for Wärtsilä

The mining company Argonaut Gold has ordered a natural gas-fuelled 22 MW engine power plant for its Magino Project in Canada. The order was booked by Wärtsilä in Q1 2022.

The power plant will supply electricity to the Magino Gold Mine located in the Province of Ontario. The order includes four Wärtsilä 34SG gas engines, electrical equipment, auxiliaries and plant commissioning. The power plant will be in operation in 2023.

Jon Rodriguez, Director of Engine Power Plants, North America for Wärtsilä Energy said: "In 2021 alone, we received four engine power plant orders in Canada and three of those were from mining companies. This is a clear indication of our recognised capabilities and strength in this market."

Hitachi Energy connects big eucalyptus pulp mill

Hitachi Energy has won an order from Suzano to design and deliver a complete grid connection solution for the company's new pulp mill in Brazil.

Suzano's new factory will be the world's largest single-line eucalyptus pulp mill and Brazil's first pulp production facility to be fossil fuel free when completed in the second half of 2024. It will have an annual production capacity of 2.5 million tons and will increase Suzano's output by 20 per cent. About half of the electricity generated will be transferred to the national power grid, enough to supply around 2.3 million people for one month.

ABB to supply electrical system for green hydrogen

Plug Power has announced it will use electrical systems made by ABB for two plants that will generate a combined total of 60 tonnes of green hydrogen daily in the USA.

The first deal is for a project to be built in New York's Genesee County, where Plug Power intends to produce 45 tonnes of green hydrogen daily. Plug Power plans that Project Gateway will be North America's largest green hydrogen production facility. The Gateway project will deploy Plug Power's proton exchange membrane (PEM) electrolyser technology.

ABB will deliver its eHouse solution, as well as gas- and air-insulated switchgear, low voltage motor control units and low voltage variable speed drives.

ABB will have a similar scope of supply at the 15 tonnes/day Peachtree facility in Camden County, Georgia.

Asia-Pacific

Fortum to build Indian 200 MW solar project

Fortum has announced that it will build a 200 MW solar power project on the Indian state of Gujarat. The firm won a 500 MW solar auction organised by Gujarat Urja Vikas Nigam (GUVNL).

Fortum will sign a 25-year PPA with GUVNL at a fixed tariff of $0.03/kWh. The solar park is due to be completed by 2024.

Solar projects for L&T in India

Larsen & Toubro (L&T) has won orders in India for solar power projects. The renewable arm of the Power Transmission and Distribution Business has won an order to construct a 245 MW solar power project in Rajasthan.

It has also secured a contract to supply a 35 MW solar PV project with a 57 MWh Battery Energy Storage System in the Kutch district of Gujarat.

Solarvest to build 40 MW of solar farms in Malaysia

Solarvest Holdings has been awarded three contracts to construct a total of 40 MW of large-scale solar farms in Malaysia. The engineering, procurement, construction and commissioning (EPCC) contracts have a combined value of $36.8 million.

Solarvest was appointed as the EPCC contractor by Taiping Solar.

The three projects are TEJA 1 and TEJA 2, and Kellie Energy. TEJA 1 and 2 will be located in Kampar, Perak, and will be 15 MW and 10 MW, respectively. The 15 MW Kellie Energy solar plant will be located in Kinta, Perak. TEJA 1 and Kellie solar farms are scheduled to start commercial operation by the end of 2022, and TEJA 2 is scheduled for completion by mid-2023.

Doosan Heavy O&M contract for Jeju Hallim

Doosan Heavy Industries & Construction has signed a long-term agreement with Korea Midland Power (KOMIPO) to provide operations and maintenance (O&M) services for the 100 MW Jeju Hallim offshore wind farm. The Jeju Hallim offshore wind farm is being developed in the waters near Hallim Port, located in the northwestern part of Jeju island.

The project is owned by Jeju Hallim Offshore Wind Power Company formed by Korea Electric Power Corporation (KEPCO), KOMIPO, Hyundai Engineering & Construction (Hyundai E&C), and KEPCO E&C.

The EPC work on the project will be performed jointly by Hyundai E&C, KEPCO E&C, and Korea Leading Energy Management (KLEM).

Under the €135 million agreement, Doosan Heavy will be providing O&M services on the wind turbines installed at the wind farm over a period of 20 years once construction is completed in 2024.

Europe

Finland wind turbine order for Nordex

The French operators of green energy projects, Valorem, has commissioned the Nordex Group to supply 57 N163/5.X wind turbines for two projects in Finland. The orders also include a 35-year service contract.

Thirty wind turbines of the Delta4000 series will be for the Kalistanneva wind farm, sold by Valorem to a Finnish consortium comprised of HELEN Oy and the Bank of Ålands' Wind Power Fund. Nordex is also supplying 27 wind turbines to the Matkussaari wind farm. Both wind farms are located in the Ostrobothnia region.

The Kalistanneva and Matkussaari wind farms form part of the Viiatti project, one of the five largest wind farms in Finland currently being built. Infrastructure works will start in spring 2022. The turbines will be delivered and installed 2024 on tubular steel towers with a hub height of 148 m and equipped as a cold climate variant with a capacity of 5.5 MW.

Linxon wins Swedish substation order

Linxon has won an order from Svenska kraftnät in Sweden to revamp an existing 400 kV substation, located in Kilanda on the west coast of Sweden.

The project consists of equipment replacement of six 400 kV bays, as well as the addition of a new bay. The turnkey project includes a new control and protection system, as well as auxiliary systems housed in a new building. The substation connects several important transmission lines.

Ingela Hålling, Managing Director of Linxon Hub Nordics, said: "The Kilanda substation is an important Hub in the west coast power grid and has reached its technical lifetime, needing a revamp to ensure continued operation, while increasing performance and decreasing future maintenance cost."

wpd places 30 MW wind order in Italy

Renewables developer wpd has placed an order for the 30 MW Licata wind park, to be located in Sicily, Italy, with Vestas. The contract involves the supply and installation of seven V150-4.2 MW wind turbines, six of them delivered in 4.3 MW optimised power mode, as well as a 15-year Active Output Management 5000 (AOM 5000) service agreement.

Turbine delivery is planned for the third quarter of 2023, with commissioning due in the fourth quarter of 2023.

Francesco Amati, Vestas' Head of Italy, said: "We are proud to partner with wpd for their first wind project in Italy. The order showcases how the reliability of Vestas' 4 MW platform continues to optimise our customers' business case in the country."

Nexans to connect Dieppe-Le Tréport wind farm

Nexans will supply the 225 kV power cables for the connection by RTE (Réseau de Transport d'Electricité) of the Dieppe - Le Tréport wind farm, one of the largest offshore wind projects in France.

As part of the €100 million contract, Nexans will provide a complete turnkey project including the installation and protection of the cables at sea and onshore. It will also provide IMR (inspection, maintenance and repair) services for the project.

The project consists of 47 km of offshore and 18 km of onshore power export cable. The 496 MW wind farm is expected to generate an average of 2 TWh annually.

Installation of the subsea cables should start in the second half of 2024.

International

Saudi solar project won by Jinko Power

Jinko Power Technology has been awarded a 300 MW solar PV project in Saudi Arabia from the country's Ministry of Energy. The award includes a 25-year PPA under which electricity from the Saad solar plant will be delivered to the Saudi Power Procurement Company (SPPC).

The $215 million project will be built in the Central Province about 80 km from Riyadh. It will be equipped with bifacial solar modules. Construction will take place in 2022 and 2023.

Schneider Electric, Cisco to build Egypt smart grid

At the end of February, Schneider Electric and Cisco entered into an agreement to build Egypt's national smart grid. Schneider Electric will install network control centres, as well as 4000 smart ring main units that will detect and resolve network faults.

Cisco will provide IP and security infrastructure, including routers and switches, along with cyber security equipment and tools.

Schneider Electric and Cisco will build a cyber secure network, utilising artificial intelligence (AI) and the internet of things (IoT) technologies to manage and support the integration of traditional and renewable energy sources.

Sebastien Riez, Regional Cluster President, Egypt, North East Africa, and Levant for Schneider Electric, said: "Egypt's smart grid is a testament to what the latest technologies can achieve, and that is in part thanks to collaboration between companies who are at the forefront of information technology and operational technology."

MAN Energy Solutions wins sub-Saharan orders

MAN Energy Solutions has announced it will be involved in three different African ventures. They are for the supply of generation equipment for a power plant in Chad, the expansion of an existing power plant in Niger, and the commissioning of a power plant in Burkina Faso.

It will supply 4 18V32/40 CD engines to a new power plant in Chad, providing a total of 35 MW to the national grid. The plant is currently under construction north of the Chad capital of N'Djamena.

The company is adding another MAN 18V48/60TS engine to the four already present at a power plant near Niger's capital Niamey. This will increase the plant output by 20 MW to 100 MW. Ghassan Saab, Head of Power, MEA Region at MAN Energy Solutions, said: "After this expansion, the Niamey power plant alone will provide over 45 per cent of Niger's generation capacity."

MAN has also commissioned three MAN 18V51/60TS engines for a power plant expansion in Kossodo, near Ouagadougou, Burkina Faso. This will provide 55 MW to the national grid.

Dubai contract for substation shunt reactors

Dubai Electricity and Water Authority (DEWA) has awarded a contract for the turnkey supply and construction of shunt reactors in 132 kV substations to Larsen and Toubro (L&T). These will provide voltage control to help maintain high standards of availability, reliability, and efficiency.

Hydrogen

Norway and Germany plan study for hydrogen pipeline

As part of a move to boost energy supplies from Norway, Germany and Norway have signed a declaration to cooperate on a feasibility study for a pipeline that would transport hydrogen on a large scale.

Gary Lakes

As all wars do, the war in Ukraine will bring massive changes to many things, and in this case the global energy sector will experience a transformation that has up until now been primarily only the subject of conversation.

The war has not caused Europe to forget its plan to enact an energy transition to renewables and a net zero economy because it is now concentrating on securing non-Russian sources of natural gas, the war has just caught Europe with its energy sector still dependent on Russian hydrocarbons. Once Europe fixes its current energy supply problem, it will return to its energy transition plans, and probably at a quickened pace.

Germany, the EU's largest economy, is in a particularly tight spot as it relies heavily on Russian supplies. Half of its gas supply, half of its coal and about a third of its oil demand is met by Russia. For a start, German Chancellor Olaf Scholz has stopped the certification of Russia's Nord Stream II pipeline through the Baltic Sea and plans for new LNG receiving terminals are moving forward.

But Germany is pressing ahead with its plans for energy transition. In mid-March, Germany signed with Norway a declaration to cooperate on a feasibility study for a pipeline that would transport hydrogen on a large scale. Initially, the pipeline would likely carry blue hydrogen, which is produced by steam reformation from natural gas and a carbon capture and storage (CCS) system, but it would eventually transport green hydrogen, which is produced with renewable energy such as wind or solar.

Germany's Vice-Chancellor Robert Habeck, a member of the Green Party, visited Norway to discuss boosting energy supplies from Norway, including natural gas, but Norwegian Prime Minister Jonas Gahr Store also made it clear that Norway is keen to supply hydrogen to Germany.

A joint declaration issued at the end of discussions said: "Norway wants to actively contribute to the rapid development of the hydrogen market in Germany and the EU. To this end, it has been agreed that a joint review will be conducted with a view to making large-scale transport, including via pipeline, of hydrogen from Norway to Germany possible."

Germany would prefer the hydrogen to be green, but Norway's infrastructure system could more easily and quickly produce blue hydrogen.

"We need green hydrogen, carbon-free hydrogen, and Norway has great capacities for that," Habeck stated after his meeting with Store. Regarding the pipeline, he said the two countries "plan to rapidly commission a joint feasibility study on this."

Transporting hydrogen by pipeline is viewed as the best way to move it from one place to the next as it is economically effective and more climate friendly than shipping it by vessel. If the two countries move forward on this plan, it would kick-off hydrogen delivery by pipeline on a major scale, which would likely increase demand, and it would also give a boost to CCS projects. Furthermore, hydrogen is reported to be easily transported through existing gas pipeline systems.

"In order to realise the fastest possible high-volume imports of hydrogen and ensure the rapid availability thereof, we will also jointly plan the use of blue hydrogen for a transition period," the joint statement said, noting that ultimately, green hydrogen will be expected through the line.

Meanwhile, most of Europe is moving forward on the subject of renewables. Norway is preparing a tender for an offshore wind project in the southern North Sea with the first phase capacity of 1.5 GW going to Norway and power from a second phase going directly to Europe.

UK Prime Minister Boris Johnson stressed in a newspaper article the need for his country to move quickly to renewables to achieve energy independence. He wrote in the *Telegraph* that Britain would "double down on new wind power" and "do more to exploit the potential of solar power", which he added is "remarkably cheap and effective".

It is not only climate change that presents itself as a threat to Europe's and the world's well-being, but European leaders realise that Russia's President Vladimir Putin must be stopped in Ukraine or he may be encouraged to target other countries formerly under the Soviet Union's sphere of control. As Johnson said in his article: "Putin may have his hand on the taps for oil and gas. But there is nothing he can do to stop the North Sea wind."

Gas

US and EU boost energy ties to improve gas supplies with eyes on net zero

A series of summit meetings in Brussels has restored and strengthened trans-Atlantic ties between the US and Europe to a level unseen in decades.

Gary Lakes

Prompted by the invasion of Ukraine by Russian forces, US President Joe Biden visited the European Union in late March to attend top level gatherings of NATO, the G7 and the EU with the intent of forming a strong Western bond among allies against the war started by Russian President Vladimir Putin on February 24.

Top of the agenda was securing and expanding military and humanitarian aid to the Ukrainian government and people, respectively. And tied with the top issue was security of energy supply for the EU, which has committed itself to ending purchases of Russian oil and gas before the end of the decade.

President Biden and European Commission President Ursula von der Leyen announced at a joint press briefing in Brussels on March 25th the formation of a joint Task Force for Energy Security with the purpose to reduce Europe's dependence on Russian fossil fuels. The Task Force will be jointly chaired by representatives from the White House and the EC and will "work to ensure energy security for Ukraine and the EU in preparation for next winter and the following one while supporting the EU's goal to end its dependence on Russian fossil fuels", a statement released by the White House said.

EU countries get 40 per cent of their natural gas supply, currently about 140 billion cubic metres, from Russia with some EU members getting practically all of their gas through pipelines operated by Russian gas monopoly Gazprom. Russia is also a major gas supplier to NATO member Turkey, which has yet to condemn Moscow over the war.

The Task Force has two primary goals: (1) Diversifying LNG supplies in alignment with climate objectives; (2) Reducing demand for natural gas, according to the joint statement.

Russia exported some 185 bcm of natural gas by pipeline during 2021, with 10 bcm going to China, according to data tabulated by *Reuters*. Gazprom had planned to deliver 183 bcm to Europe in 2021, down from the 201 bcm it delivered in 2018. During the later months of last year, Gazprom had been trimming its exports of gas to the EU causing European stocks to decline. It is suspected that that action was taken in anticipation of the Ukraine invasion.

In the months and years ahead, Europe is expected to rely more heavily on LNG as it weans itself off pipeline gas from Russia. For 2022, the US intends to deliver an additional 15 bcm of LNG to the European market and is expected to increase that volume in the years ahead as the US LNG export industry ramps up.

For its part, the EU said it will ensure demand until 2030 for US LNG amounting to some 50 bcm annually. This will be done on the understanding that prices should reflect long-term market fundamentals and stability in supply and demand.

The US and the EU "have reached a major breakthrough that will address the existential threat of climate change while also protecting American jobs and American industry," Biden said at the Brussels briefing, adding that the deal is "a testament to the power of our strong relationship".

The US and EC "will undertake efforts to reduce the greenhouse gas intensity of all new LNG infrastructure and associated pipelines, including through using clean energy to power onsite operations, reducing methane leakage and building clean and renewable hydrogen-ready infrastructure," the joint statement said.

The US has promised to maintain an "enabling regulatory environment with procedures to review and expeditiously act upon applications to permit any additional export LNG capacities" needed by the EU. This would affirm the joint resolve to terminate EU dependence on Russian fossil fuels by 2027," the statement said.

The Task Force will also "engage key stakeholders, including the private sector, to formulate immediate recommendations that will reduce overall gas demand through accelerating market deployment and clear energy technologies and fuel switching."

Russia's invasion of Ukraine has put Europe in a tough spot. To meet energy demands, coal will likely remain as a source of power generation for longer than planned. But the revived dependence on fossil fuels will not upset the overall plan to move ahead on net zero targets. If anything, the Ukraine war will likely speed it up.

Meanwhile, to keep pace with current gas demand, European countries are taking steps to adjust to the new situation. To this end, Germany is planning a new LNG regasification terminal at Brunsbuttel with an 8 bcm/year capacity. Italy is considering the installation of two more floating storage and regasification units (FSRU) with a combined capacity of 10 bcm/year, and Greece has plans to locate an FSRU at Alexandroupolis in the northern Aegean with a 6 bcm/year capacity.

Decarbonising heat: seeking comfort in a crisis

The ongoing Ukraine crisis could shift the heating market out of its comfort zone. The energy transition will be disruptive to traditional heating business models but will drive new opportunities for service providers – including utilities. Delta-EE's **Lindsay Sugden** explains.

Decarbonising heat is one of the biggest challenges of the energy transition. In buildings, replacing natural gas boilers with lower carbon alternatives has so far proved particularly difficult. The aim to speed up this replacement of natural gas boilers with heat pumps in particular has been named by the IEA in its 10-point plan to reduce dependency on Russian gas.

There are more than 100 million natural gas boilers in European homes today, heating around half of its dwellings. In most markets gas boilers are the cheapest option (both in terms of running costs and upfront costs), and are the traditional heating system of choice, popular with both end-users and installers. However, the wide-ranging consequences of the Ukraine crisis could trigger a shift in the heating market away from its comfort zone – and finally see low carbon, high efficiency heating overtake gas boilers in the heating market. This transition will be disruptive to traditional heating business models, and drive new opportunities for service providers – including utilities.

Considering current events, now is the time that the natural gas boiler market may finally begin to be eroded. We are at a turning point where decarbonisation is clearly no longer the only reason to reduce dependency on gas in the heating market. Two other important arguments have grown in resonance. Firstly, the need to increase energy security and energy independence is now being prioritised as Europe attempts to reduce dependency on Russian gas (which currently accounts for 40 per cent of Europe's gas consumption). Secondly, the need to reduce running costs for consumers hit by spiralling energy prices is driving a need for alternative fuels and more efficient use of the gas we do need to use (consumer gas bills have more than doubled in some markets).

The European Commission and some national governments are starting to respond, and interest in heat pumps as an alternative to gas has seen a sharp increase in recent weeks. Currently, less than 3 per cent of European dwellings get their heating and hot water from a heat pump – and almost none of these installed heat pumps have displaced a natural gas boiler. But the ongoing crisis is changing this. The economic proposition for heat pumps replacing natural gas boilers has never looked better; and customer demand for alternatives to natural gas boilers is exploding.

Under pre-crisis "normal" electricity and gas price ratios, heat pump running costs have been significantly higher than natural gas boiler running costs in the vast majority of markets and segments – the spark spread (the difference between gas and electricity prices) has simply been too large for heat pumps to make sense, despite their higher efficiencies (around 300 per cent compared to approximately 90 per cent for a gas boiler). These weak economics for heat pumps to replace gas boilers is one of the major limitations keeping the number of HP installations into existing gas-heated buildings to almost zero.

However, the rapidly evolving energy price ratios as a result of the ongoing crisis means that these economics are changing – and in favour of heat pumps. Delta-EE has analysed the economic proposition for electric heat pumps displacing natural gas boilers in existing homes across Europe. We have focused on air/water heat pumps (A/W HP) as the biggest selling heat pump which can connect to wet radiator system (though there are other types). Figure 1 shows the average annual running costs for a typical natural gas boiler and A/W HP installation in the UK and Germany under two energy price ratios: at "pre-crisis" prices; and at indicative peak crisis prices (based on the consumer gas and electricity prices seen at the time of writing). In the UK, while running costs for A/W HPs remain higher than for natural gas boilers, the difference in costs has halved compared to before the crisis. In Germany, even more dramatic changes are seen – A/W HPs are at about cost parity with the running costs of natural gas boilers for the first time.

While running cost is not the only factor in decision-making, it is notable that the direction of travel is for an improving economic proposition for heat pumps compared to natural gas boilers, which will likely be a significant factor in driving any shift away from gas towards heat pumps.

A strong uptick in activity in the market in recent weeks indicates that customer demand for an alternative to natural gas boilers is growing. High gas bills – and fears of the uncertainties to come – are beginning to influence decision making. Heat pumps in particular are seeing a rapid growth in interest. While many of these trends had already been happening over the past 6 -12 months, signs from the market indicate that this is accelerating as a result of the current crisis.

Sales of HPs in 2021 were already up by 30-50 per cent compared to 2020 (in e.g. UK, France, Denmark), with at least some of this growth attributed to the growing interest in HPs in the final quarter of the year as the energy price impact started to be felt. The expectation in the market is that this increased growth will continue into 2022. In Denmark, for example, some installation companies have reported growth in interest in HPs by more than 300 per cent just in the last month. The German heat pump association has reported a spike of similar magnitude in visits to its website as well as google searches for HPs.

The HP supply chain is struggling to keep up with the increased demand, and many manufacturers say they could have sold more if they had had the products available – wait times for HPs are reportedly as long as six months in extreme cases, and the bottleneck is availability of products. The industry is responding by, for example, expanding production lines (e.g. Vaillant, Bosch), and investing in bringing warehouse facilities and transport capabilities in-house (e.g. Freedom Heat Pumps – a major UK HP distributor). Still, there are challenges to overcome with component shortages and installer capacity.

Governments are also responding and planning to further incentivise switching away from gas – which will likely further increase demand. For example, in France, more subsidies will be available for HPs and biomass under the MaPrimeRénov subsidy. In Denmark, the home renovation fund will increase the share of funding, which should be earmarked for heat pump installations (as opposed to general building improvements).

The direction of travel is clear – the heating transition is accelerating. Under a continued energy price crisis, the speed of the heating transition will only increase, driving greater opportunities for high efficiency heating and service-based heating propositions. Delta-EE's forecasting of the evolution of the heating market for the coming years under a "continued energy price crisis" scenario highlights:

- Strong growth in hydronic HPs (mainly, but not only, air/water), sales of which could triple by 2025 compared to 2020.
- A role for other high efficiency solutions. Hybrid heat pumps, which offer the possibility to switch between gas and electricity depending on the fuel prices, could see growth rates similar to air/water heat pumps. Thermally driven heat pumps, which typically save 30-40 per cent gas compared to a gas boiler could also find some sweet spots in the market.
- A possible resurgence of biomass boilers in some markets as customers aim for energy independence without reliance on oil, gas or electricity.
- Natural gas boilers will suffer the most from this crisis – potentially dropping by around 20 per cent by 2025 compared to 2020 (pre-crisis levels). While the emergence of a hydrogen-for-heat market may well save gas boiler sales, this will not be a reality until beyond 2030 (if at all).

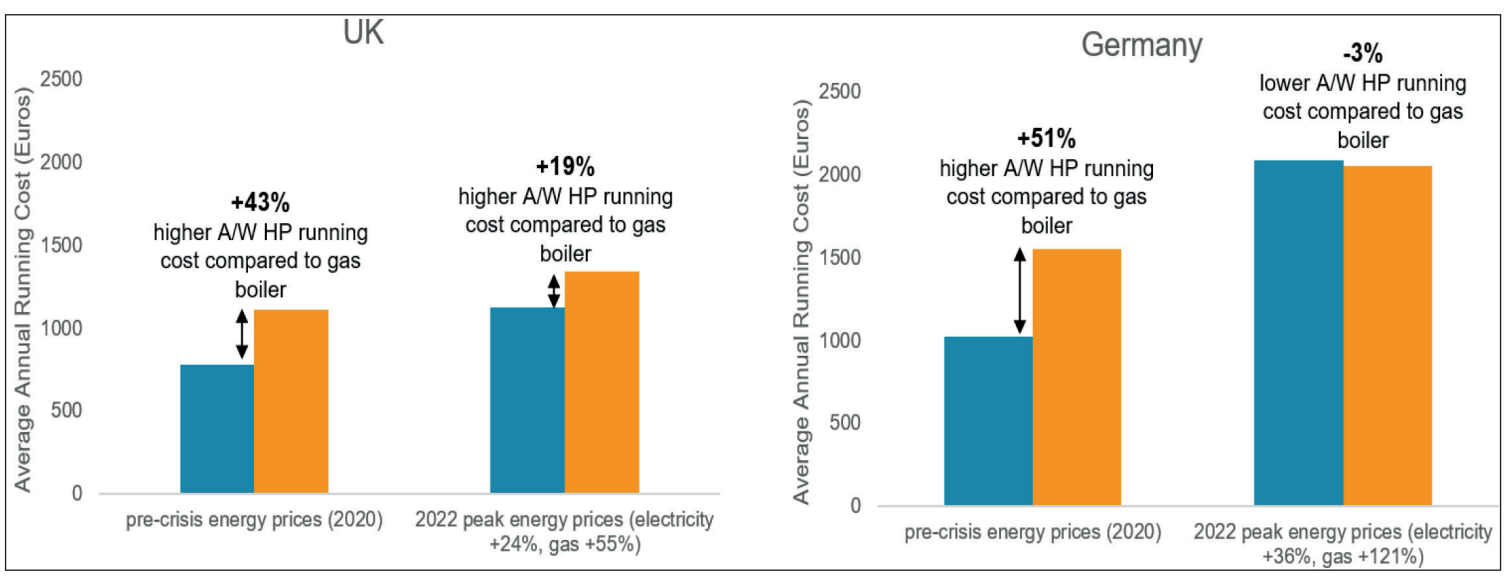
So what could this acceleration of the heating transition mean for utilities? It means there are growing opportunities. This accelerating transition to new heat as a result of the energy price crisis is disrupting not only the heating appliances (and fuel) being sold, but how they are sold. Traditional utility business models, selling kWh of electricity and gas, are no longer the route to success. Rather, the utilities which will be successful are those which can save their customers' kWh of energy, make the customer journey from natural gas to low carbon and high efficiency heating simpler, and maximise emerging new value streams. Utilities are well positioned to be the major service providers of the new heat market. For example:

- they can offer service-based propositions, which can help consumers save energy through optimisation services or full heat-as-a-service offerings;
- they can be a one-stop-shop for end-users transitioning away from gas – offering advice, support, and installation/maintenance services;
- they can offer solutions that can help customers become more energy independent – self-consumption of PV, for example, which could be packaged together with a heat pump;
- they can offer services, which capture the emerging flexibility value streams driven by greater electrification of heat.

While many of these trends were beginning to happen over the past years, the current crisis is serving to push the market towards an inflection point where decarbonisation of heat – and the services and propositions that enable this – could truly become a mass market heating choice. The combination of decarbonisation policy, the need to reduce dependency on natural gas, and the growing consumer interest in heat pumps are combining to drive acceleration in the transition to a new heat market.

Lindsay Sugden is head of Delta-EE's heat research team.

Average annual running costs for a typical natural gas boiler and air/water heat pump installation in UK and Germany under two energy price ratios



Putin's War: the short- and long-term impacts on Asia

Russia's invasion of Ukraine will impact Asia's path to net zero, especially in the short-term. Beyond the 24-month horizon, however, the region's outlook for decarbonisation is bright, with support from capital markets looking for green and sustainable opportunities. **Joseph Jacobelli** explains.

The horrific invasion of Ukraine by Russia's President Vladimir Putin has created a humanitarian catastrophe, killing thousands and displacing millions. It has also worsened the global economic environment, with prices of many commodities, including energy commodities, sky-high just as the world was recovering from the effects of the Covid-19 pandemic. But how is Putin's War affecting the Asia Pacific region's path to net zero emissions by the middle of the century? Certainly the energy transition will be negatively impacted in the short-term. Yet, there are several mid- to long-term positives.

The global energy transition outlook was bullish after COP26 ended in November 2021. Global climate action gained renewed momentum despite the lukewarm short-term economic expectations that included lower global GDP growth, higher inflation, and increases in interest rates. The IMF in January 2022 expected that global inflation would gradually fall thanks to diminished supply-demand disparities and the monetary policy responses from major economies. On February 24, Putin's War worsened the outlook. The conflict may lower global GDP by one percentage point and raise global inflation by 2.5 percentage points, the OECD wrote in March 2022.

In the short-term – over the next 12-24 months – the macro environment negatively impacts the pace of the energy transition in the Asia Pacific region in four ways. The factors include high materials inflation, slower projects build-out, higher interest rates, and possibly income disruptions for some new projects.

The first short-term negative is higher inflation which will raise the prices of materials used to build the equipment that produces clean energy. Some of the materials used for the construction of wind turbines, for example, include aluminium, chromium, concrete, copper, glass, iron, manganese, molybdenum, nickel, plastic, steel, zinc, as well as some rare earths, such as dysprosium, neodymium, praseodymium and terbium, and minor metals, according to EIT RawMaterials.

A second short-term effect is that the pace of construction of new clean energy generation facilities may slow due to supply chain constraints. Specifically, the supply shortfall of the key raw materials will impact the production of renewable energy generation equipment, such as wind turbines, solar cells as well as related equipment like solar inverters. This in turn will slow the construction pace of new clean energy projects

A third factor is that the high inflation will also mean interest rates will rise; probably by several percentage points on average in the next 12-18 months. The increase will raise the construction costs of projects. In Asia Pacific, clean energy projects such as utility solar power generation installations are 50-80 per cent debt financed – typically the higher end of that range. All of the projects' expenditure is upfront. So, if during the first few years of the life of the project interest rates rise, it will affect its return on investments.

Finally, this poor macroeconomic environment may impact the income of some clean energy projects that have only recently signed long-term power purchasing agreements. If a renewable energy project concluded a long-term power purchasing agreement a few weeks or months before Putin's War started, it may have locked in a fixed price for the power sold. This could see it stuck with that price, despite a rise in cost, and would negatively impact the returns as well.

Arguably, the short-term negatives are a global phenomenon and not just Asia specific. The key difference between the region and the rest of the world is that Asia Pacific is the largest energy consumer in the world and it is building more clean energy capacity than the rest of the world combined. It also means that the effect on the region will be amplified.

The short-term may be rather dim but the medium- to long-term, i.e. beyond 24 months, is bright. The first factor is that many key energy markets in the region will accelerate their energy mix shift as they seek to enhance energy security, cut pollution, and control energy price volatility. Goals that can easily be achieved by reducing their reliance on fossil fuel-based energy. Secondly, they will also more aggressively seek newer clean and sustainable solutions. Finally, these efforts will be supported by capital markets that increasingly seek green and sustainable opportunities.

Asia Pacific's reliance on fossil fuels is massive. The region accounted for 45.5 per cent of global primary energy consumption in 2020 – the biggest consumer by a massive margin, using BP's *Statistical Review of World Energy* published in July 2021. The second largest share was North America with a share of just 19.4 per cent. The region's liquified natural gas accounted for almost 71 per cent of the world's total and is rapidly increasing. It also accounted for almost 80 per cent of global coal imports. In terms of oil, Asia Pacific imported 58 per cent of the world's crude oil and 46 per cent of global oil products. This makes the region highly exposed to energy commodities supply disruptions. Also, it is sensitive to commodity prices fluctuations and many of its energy markets do not have mechanisms to pass through the higher energy costs to end users.

An example is Asia's LNG price volatility. Consumption has been growing at a massive rate and is expected to continue to rise sharply in the coming decade. The compound annual growth rate between 2009 and 2019 was 3.3 per cent – 2020 is not a representative year given Covid-19. This compares to the Middle East's 3.1 per cent, Africa's 2.5 per cent, Central and South America's 1.3 per cent, North America's 0.6 per cent, and Europe's negative 0.2 per cent.

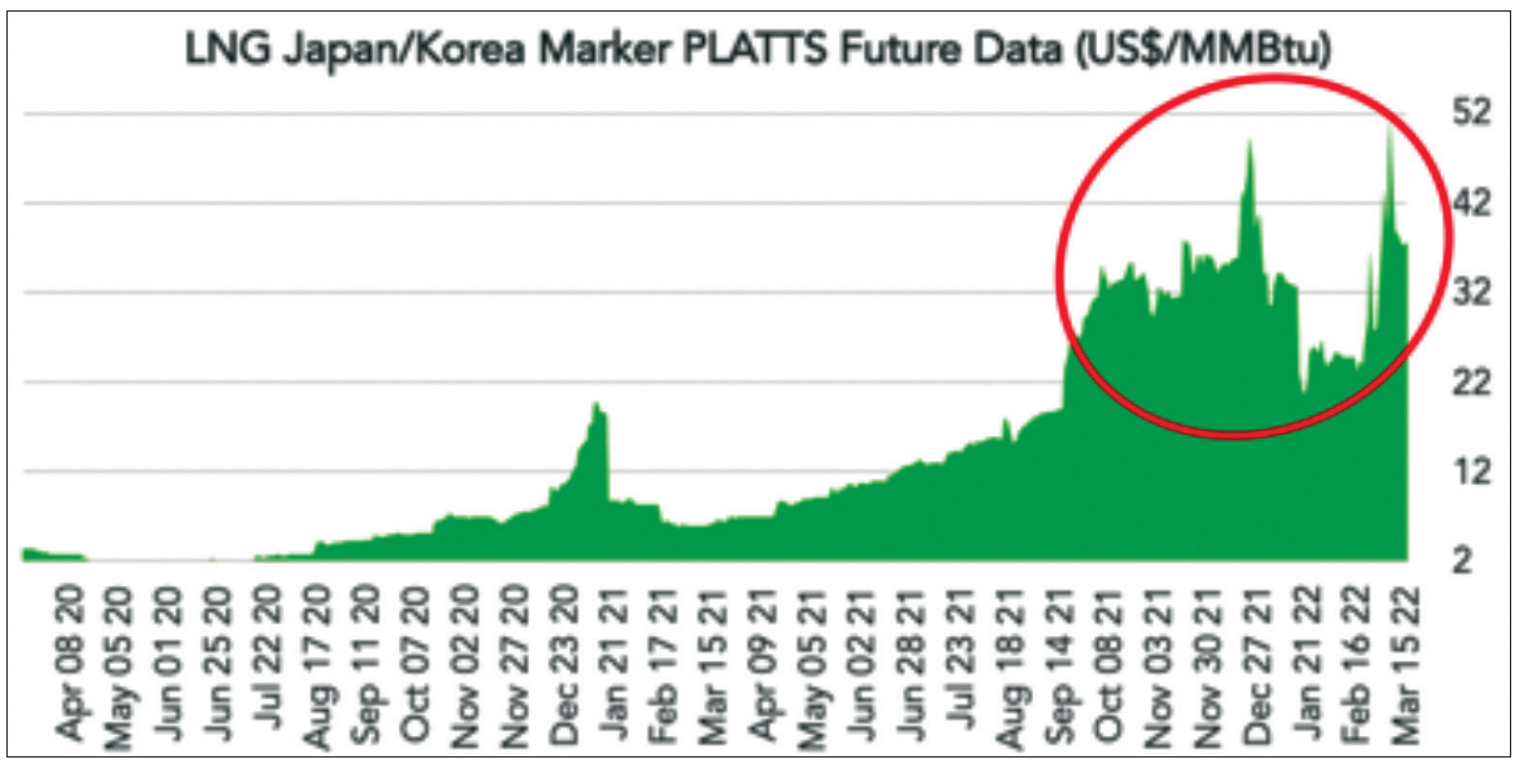
The price of LNG in the region over the last couple of years, not only has sharply increased but has been highly volatile. This year, through 15 March, the lowest LNG Japan/Korea Marker Platts Future price was $20.53/MMBtu. The peak price was 2.5 times higher at $51.77/MMBtu. This massive volatility hurts the importing economies' balance sheets, utilities profits and much more. Some of the markets, such as South Korea and Taiwan, do not fully pass through the commodity increases to end users.

The issues presented by fossil fuels means that there will be a continued drive in most of the region toward new clean energy solutions and many markets are rich in innovation. China is at the forefront in the exploration of the viability of newer solutions in areas ranging from vehicle-to-grid charging systems to carbon capture, utilisation, and storage (CCUS).

China is not alone. Singapore, for example, has been aggressively pursuing energy storage systems (ESS) research and pilot projects to support a major increase in solar capacity. This includes exploring the deployment of floating ESS, something particularly important given Singapore's land resource scarcity. Another example is Australia, which is devoting a large amount of public and private resources to the development of cost-competitive green hydrogen. Examples in the region simply abound.

The final factor is the capital markets. In the past few years, capital in Asia Pacific markets has faced the same "green" pressures as the rest of the world and progress has been impressive. Private capital interest in renewable energy projects in the region has gained significant momentum. In the equities markets, the region has seen a trickle of energy companies spinning off their clean energy assets as well as a few private firms' listing. There has also been news of Special Purpose Acquisition Companies (SPACs) dedicated to clean energy seeking to be listed in Hong Kong and in Singapore.

In the credit markets, the issuance by Asian governments or corporations of green bonds and other related bonds such as sustainability-linked bonds, is sharply accelerating. In the lending markets, the largest financial institutions in the region are gradually adopting guidelines to stop lending to fossil fuel-based projects, raise the amount of green lending, and also structure net zero emissions portfolio strategies. Finally, according to a recent survey by The Asia Investor Group on Climate Change (AIGCC), most asset managers "have or are in the process of launching climate-related investment solutions".



LNG Japan/Korea Marker Platts Futures data ($/MMBtu). Source: Investing.com, Fusion Media (investing.com/commodities/lng-japan-korea-marker-platts-futures-historical-data)

Note: This commentary was written March 19, 2022; data as of 15 March 2022.

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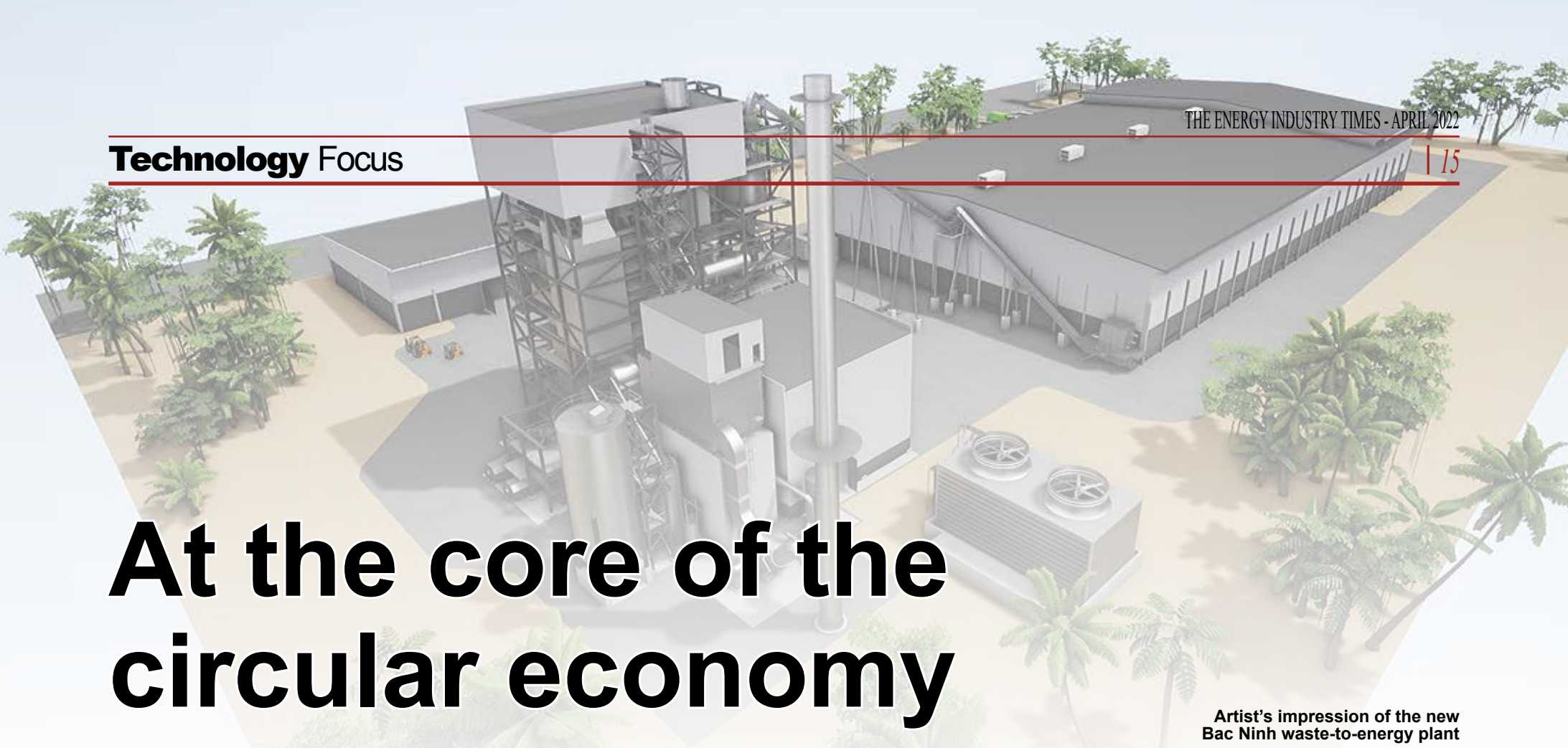

At the core of the circular economy

Artist's impression of the new Bac Ninh waste-to-energy plant

A new waste-to-energy boiler being supplied to Vietnam's Thang Long Energy Environment Joint Stock Company will support the transition towards sustainable energy and a green economy in Vietnam's Bac Ninh province. Valmet's **Jouko Latva-Somppi** and **Jussi Orhanen** explain the drivers behind the project and the technology.

The waste-to-energy (WtE) market is growing in Southeast Asia, presenting new opportunities to deploy technologies that can facilitate and drive the circular economy. At the start of February this year a project was announced that will see Finland's Valmet deliver its first WtE boiler boiler in the region.

The contract was signed between Valmet and the Thang Long Energy Environment Joint Stock Company, a new player in the WtE field established to build and operate what is also the region's first WtE facility.

Valmet's delivery will consist of a Valmet CFB Boiler, Valmet Flue Gas Cleaning system and Valmet DNA Distributed Control System (DCS) for the complete WtE plant. The entire package is under Valmet's scope.

The project's engineering, procurement, and construction (EPC) contractor is TTCL Vietnam Corporation Limited (TVC), a subsidiary of Thailand-based ECP contractor TTCL Public Company Limited (TTCL). TVC will build the plant and provide the turbine island and auxiliary equipment.

Detailed engineering for the project is ongoing and the installations at site will start early next year. The plant is scheduled to come on stream at the end of 2023.

The project will be built in Bac Ninh province, near Hanoi, a rapidly developing region that is attracting a significant amount of international investment.

While the percentage of food waste is still high in Bac Ninh's municipal waste, the proportion of waste with high energy value, like plastic, is expected to increase. Also, improvements in recycling could reduce waste volumes or change the characteristics and quality of the residual waste. It is thus essential to utilise WtE technology that can adapt to such changes. If the situation were to change in ten years, for example, the plant must still provide outstanding efficiency.

As a new player, Thang Long Energy Environment was looking to differentiate from its competitors with a high-efficiency power plant that uses the best available technology and meets strict emission standards.

This made a circulating fluidised bed (CFB) boiler the ideal technology, as it is the perfect choice for efficient and environmentally-sound energy production from waste-derived fuels. This combined with Valmet's extensive experience in energy production from biomass and residual waste streams in Europe, the Americas, China and Japan, was a key argument convincing investors to join the project.

Valmet is one of the very few companies that can deliver its own in-house technology for the combustion of waste-derived fuels and for the cleaning of flue gases, combined with a plant-wide distributed control automation system.

As an experienced supplier of automation solutions for sustainable and diverse waste-to-energy plants that utilise industrial, municipal and wood waste or sludge, the Thang Long WtE plant will incorporate a Valmet DNA Distributed Control System (DCS). With scalable architecture, the system provides complete control of all processes in the plant, providing robust control, monitoring, protection, optimisation, and reporting applications.

Through the automation solution, Valmet can support service operations locally, but also has a remote-control system in place at the plant. This means Valmet can handle problem-solving and reporting from all over the world. Remote monitoring is a fast-growing area in which Valmet is investing heavily.

The plant will also include a Valmet flue gas cleaning system to provide optimal environmental performance to meet the strictest emission limits. NOx is one of the most significant air pollutants in flue gas. When released into the atmosphere, it causes smog and acid rain, leading to health and environmental hazards. The global trend has therefore been towards tightening limits on NOx emissions.

In addition to its high efficiency, the CFB boiler offers the advantage of having the lowest emission levels in combustion. The flue gas cleaning can be optimised based on the CFB solution. The plant can be run at such low emission levels that further NOx reduction – for example, by a catalyst, as is often needed with other competing technologies – is not needed. The CFB boiler uses semi-dry flue gas cleaning and does not need a scrubber, so it avoids the problem of water treatment. Heavy metal emissions are eliminated with activated carbon. The technology allows sulphur and chlorine to be present in the incoming waste.

Although the technology is slightly more expensive, it is more efficient and the investment aims to support a clean and green economy and protect Bac Ninh province's environment through more sustainable energy production.

The CFB boiler will burn refuse-derived fuel mainly from municipal and partly from industrial waste to produce steam for a turbine generator. Valmet's technology has proven to be effective in applications with many demanding fuels. Fuel flexibility in general is a critical topic at the power plant. Plants are of course optimised for a specific fuel mix, but thanks to the fuel flexibility of CFB boilers, plant operators have more options to source fuels.

To produce a good quality fuel, wet municipal waste will be pre-treated and mixed with separately collected dry industrial or commercial waste. The plant will handle approximately 600 tons of municipal and industrial waste per day. Non-combustible inert materials and recyclable metals will be removed from the waste flow and MSW will be crushed into a suitable size for the boiler.

In this project, the waste pre-treatment line will come from another Finnish technology provider, BMH Technology. As a long-standing partner, its technology fits well with Valmet's. The pre-treatment of waste will steadily increase as the facility helps to move step-by-step towards a circular economy, targeting both material and chemical recycling.

On the journey towards a circular economy, combustion of residual waste is essential to avoid landfilling. Whenever combustion of waste is applied, it must be accompanied with good waste pre-treatment. The days of direct incineration of bag trash are gone.

In Europe, treatment facilities charge high gate fees, forcing waste disposers to pay for their waste. The plants are therefore optimised to capture as much waste as possible, and the efficiency is embedded more in heat generation than in electricity production.

Vietnam has selected another route to subsidise its WtE plants through the use of national electricity feed-in tariffs. This encourages investors to seek maximum electricity efficiency instead of just maximising waste throughput.

For the Thang Long project, a CFB boiler was chosen not only to ensure fuel flexibility and low emissions, but also to maximise the plant's electricity efficiency. The CFB boiler can produce steam to a turbine at a higher pressure and temperature than any other boiler type, and this means a higher electricity yield.

The new plant will generate around 10 MW of electricity for the Vietnam national power grid. The national Vietnam Electricity Corporation will contribute approximately $100/MWh for 20 years. The efficient plant will amortize the investment during this time, which is the main driver for the investor.

With all the benefits of this new technology, the power station's profitability and environmental performance will improve significantly. This was also a significant factor for the investor.

Nordic countries are forerunners in developing clean technology, and Finland's proven know-how in clean-tech has a good reputation in Vietnam. Valmet has received support from Business Finland to develop a techno-commercial solution viable for emerging WtE countries like Vietnam.

The company has been developing a business model together with its partners and with the support of Business Finland. Valmet has developed operating models for partnership-based business together with other Finnish companies, partly with Business Finland's grant money.

It has co-developed the WtE plant solution with technology partners such as BMH, with which Valmet has been engaging in long-term co-operation in combustion, flue gas treatment, automation and service. The company has also worked together with local companies to find a new partnership model that makes contractual structures competitive.

The Bac Ninh project is evidence that these initiatives are bearing fruit.

Jouko Latva-Somppi, is the Director for Valmet's Heat and Power Plants business. Jussi Orhanen, is the Business Development Manager for Valmet's Energy business.

Juoko Latva (left) and Jussi Orhanen: combustion of residual waste is essential to avoid landfilling

Junior Isles

It's time to end the Russian roulette

Relying on gas from Russia is a bit like playing Russian roulette. But even when the war in Ukraine comes to an end, there will be a number of countries still dependent on Russian gas – perhaps wondering when that bullet in the chamber will have their name on it.

Unfortunately, it is a situation that Europe has long been sleepwalking its way into. While Russia was perhaps not at fault when it first cut gas supplies to Ukraine more than a decade ago, some could argue that the writing was on the wall. The potential for the current energy crisis was evident.

Although some European countries have been moving to reduce gas consumption and Russian dependency, progress has been all too slow. Indeed some have gone the other way, increasing imports from Russia to meet growing demand.

The ideal scenario for the EU, when considering the challenge of reaching net zero targets, is to phase-out reliance on fossil fuels altogether. It is indeed the end game but it will take time. And options for the heating sector are fewer than for electricity generation. Yet the historical over-reliance on a single source of gas to the extent of countries like Germany and Italy, has proven to be short-sighted at best and foolish at worst. So now with shots fired, the scramble begins.

Italy is one of Europe's biggest users and importers of natural gas, importing 90 per cent of its gas supply with 45 per cent of that coming from Russia – up from 27 per cent ten years ago. In light of current events, last month the country said it will end its reliance on Russian gas by 2025.

Germany, meanwhile, imports 55 per cent of its gas from Russia, according to the economy and climate ministry. Even more boldly, its government recently said the country could end dependence on Russian gas by mid-2024. Vice Chancellor and Minister for Economic Affairs and Climate Action, Robert Habeck, told journalists in Berlin in late March: "Companies are letting contracts with Russian suppliers expire, not renewing them and switching to other suppliers. And at an incredible pace."

Already, in preparation for a potential rationing of energy in the coming winter, network operators have sent large industrial groups letters asking them to outline their energy needs in anticipation of possible shortages. According to the *Financial Times*, two industrial companies with plants in the east and southeast of Germany said their local suppliers had warned them that gas deliveries could be curtailed by the end of the year.

While bracing for the imminent impact, Germany, Italy and others have embarked on a frantic rush to secure gas deals with other global producers, while at the same time accelerating the transition to renewables.

In early March Italy's Foreign Minister Luigi Di Maio travelled to Qatar and Algeria to strengthen energy ties. At the same time the country is looking to increase extractions from domestic gas fields. Along with Spain, Italy is also looking for ways to increase pipeline imports from Libya and Algeria. Italy and Spain will then see how to send it to their European neighbours. Certainly Africa, beyond North Africa, could be a player in the future. Investment in infrastructure could see Mozambique become an important source for Europe. Nigeria is already ramping up production, creating an opportunity to increase exports to Europe.

More recently, Germany sealed a long-term agreement with Qatar for the supply of LNG. In Doha as part of a Gulf tour, Habeck said the deal would be a "door-opener" for Germany's economy. No details were provided on the quantities or other terms discussed. The ministry said it would be up to individual German energy companies, which accompanied Habeck on the trip to Qatar, to sign deals with the Arab state's enterprises.

"We might still need Russian gas this year, but not in the future," Habeck was quoted as saying by DPA in Doha. "It starts like this – so he who has ears should start to listen," he said, in a veiled message aimed at Putin.

The most significant development, however, came as Habeck spoke in Berlin the following week. On March 25th, European Commission President Ursula von der Leyen and US President Joe Biden announced a deal that would see the US deliver an additional 15 billion cubic metres (bcm) of LNG to the EU in 2022.

Significantly, the European Commission said it will work with EU Member States and market operators to pool demand through a newly established EU Energy platform for additional volumes between April and October 2022.

This is welcome news for those that voiced concerns over European countries competing for bilateral gas deals. Just ahead of the meeting between Biden and von der Leyen, Belgium's Prime Minister Alexander de Croo said the EU should draw on the success of the European Commission's joint Covid-19 vaccines procurement and make a combined effort to secure large quantities of gas.

In an interview with the *FT* he said: "This is about making sure it's not a competitive race and a scramble for gas capacity. You could have a solidarity mechanism to make sure everyone, every moment of the year, gets enough access to enough gas. I'm not blaming countries that are doing [bilateral deals] for the moment – that's perfectly normal behaviour. But there is a better way of doing it – as a group."

Commenting on the EU-US deal, Habeck commended the "great unity" of European states and transatlantic partners in their efforts to become independent from Russian energy. It is this unity that would help "put a stop to Putin's game", he said.

While Europe may have to play Putin's game for a little while longer, there is certainly much it can do now; and finally it is moving at a speed one might not have thought possible.

At the start of March, the International Energy Agency (IEA) published a 10-Point Plan to reduce imports of Russian natural gas by more than 50 billion bcm, or more than one-third, within a year. The range of measures, it says, is consistent with the European Green Deal and support energy security and affordability.

The IEA analysis noted that other avenues are available to the EU if it wishes or needs to reduce reliance on Russian gas even more quickly – but with significant trade-offs. The major near-term option would involve switching away from gas consumption in the power sector via increased use of Europe's coal fired fleet or by using alternative fuels, such as oil, within existing gas fired power plants. Given that these alternatives to gas use are not aligned with the European Green Deal, they were not included in the 10-Point Plan.

Following the IEA's plan the European Commission proposed its outline of a plan to make Europe independent from Russian fossil fuels well before 2030, starting with gas. REPowerEU will seek to diversify gas supplies, speed up the roll-out of renewable gases and replace gas in heating and power generation. This, it believes, can reduce EU demand for Russian gas by two thirds before the end of the year.

It is a bold move but one that is absolutely necessary. To continue to rely on Russia is suicide – coming more likely sooner than later. The Commission's "switch to renewables and hydrogen, combined with more energy efficiency" cannot come fast enough. And there is nothing like looking down the barrel of a gun to focus the mind.

Cartoon: jemsoar.com