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Europe eyes options on tackling energy prices

The EU has proposed a set of emergency measures in response to the urgent priority of shielding EU consumers from higher energy prices this winter. But EU-wide measures must avoid a patchwork of rules between member states. **Junior Isles**

The European Commission has proposed a set of emergency measures in an effort to combat spiralling energy prices but the move comes as individual EU states are already taking approaches that could create national market discrepancies and uncertainty across the bloc.

Commenting on the emergency intervention Commission President Ursula von der Leyen said the proposals will raise more than €140 billion for member states to "cushion" the impact of high energy prices on consumers.

A key part of the package is a proposed tax on excess profits from energy companies that governments could use to protect businesses and citizens from sky-high energy bills this winter.

The Commission has therefore proposed a cap of €180/MWh for 'infra-marginal' sources, i.e. those with the cheapest operating costs, including wind, solar and nuclear power plants, because those plants could profit most from a surge in electricity prices.

"These companies are making revenues they never accounted for, they never even dreamt of," von der Leyen said. "In these times, it is wrong to receive extraordinary record revenues and profits benefitting from war and on the back of consumers."

The Commission has estimated that Member States would be able to collect up to €117 billion from the proposed temporary revenue cap on infra-marginal electricity producers, on an annual basis. The surplus revenues collected will have to be channelled by the member states to final electricity consumers, be it private or commercial ones, who are exposed to high prices. These revenues can be used to provide income support, rebates, investments in renewables, energy efficiency or decarbonisation technologies. The support provided should keep an incentive for demand reduction. Decisions on the precise distribution will be taken at national level.

WindEurope, however, warned of the uncertainty that could be created by decisions also being taken at national level. "A patchwork of different price caps, unilaterally introduced by individual member states, creates investment uncertainty, said WindEurope's CEO Giles Dickson.

Ahead of the Commission's proposal, Czech Prime Minister Petr Fiala introduced a price cap of approximately €200/MWh (without VAT). Due to the so-called 'Iberian derogation' prices in Spain and Portugal are already capped at well below the EU average.

In a message to national governments, WindEurope stated: "More renewables require huge investments. Investors need clear rules around their likely revenues. A new EU-wide revenue cap of €180/MWh for all forms of infra-marginal generation gives them that.

"But if governments are free to deviate from that, clarity goes out of the window – especially if you decide to set different caps for different types of electricity generation. Investors don't

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Move for electricity market reform gains traction

Brussels will work on a comprehensive reform of its energy markets to break the "dominant influence" of the price of gas on electricity prices.

The move is one of several emergency measures proposed by the European Commission in an effort to tackle high energy prices and ensuring consumers benefit from the low cost of renewables and nuclear.

Speaking to MEPs in September, European Commission President Ursula von der Leyen told MEPs that the design of energy markets was not "fit for purpose" and that it needed to be redesigned.

"The skyrocketing electricity prices are now exposing, for different reasons, the limitations of our current electricity market design," she said. "We need a new market model for electricity that really functions and brings us back into balance."

Under the current EU wholesale electricity market system, all electricity producers – from fossil fuels to solar and wind – bid into the market and offer power according to their production costs. Dispatching starts with the cheapest resources, the renewables, and finishes with the most expensive ones, usually natural gas. The last source to be dispatched sets the system marginal price. But since most EU members still depend on fossil fuels for their energy demands, the final price of electricity is often set by the price of natural gas.

Several EU governments, including Germany, Austria, and Belgium, have recently called for reform in the pricing mechanism of the European energy market and to decouple gas and electricity markets.

Spain, Greece, Italy, France, and Portugal have been calling for similar reforms for over a year to protect consumers from rising energy prices.

The UK is also looking to decouple gas and electricity prices. In two papers published last month by UCL, researchers outlined reasons why, despite the advance of relatively cheap renewable energy, electricity prices have rapidly risen across Europe alongside the increased cost of natural gas. They identify the structure of the wholesale electricity market as the main driver of excessive prices, and are developing solutions to change this.

According to the research, the ongoing energy crisis has pushed retail prices up by over 80 per cent this year, and quadrupled wholesale prices, fuelling the 'cost of living' crisis and inflation. Yet the UK already generates half of its electricity from non-fossil sources, with 25 per cent from wind and solar power, whose costs have fallen hugely to around a quarter of the costs now seen in the wholesale electricity market. But the structure of the UK's power market means that these falling costs are not reflected in bills.

Professor Michael Grubb (UCL Institute for Sustainable Resources), who is leading the research, said: "While renewables are providing more and more electricity, we still need natural gas to meet the demand. The most expensive natural gas producers are still needed to cope with fluctuations in renewable energy production, so they are setting what's called the marginal cost, at the edge of what's needed. Because natural gas generation is expensive, those producers charge the highest prices – which means that other producers are also able to charge similar prices."

However, Kristian Ruby, Secretary General of Eurelectric, the organisation representing Europe's electricity producers, said: "The root cause of the problem is a shortage of gas supply and our addiction to imported fossil fuels. Governments should seek to tackle this rather than resorting to distortive, ad-hoc interventions in the electricity market. In parallel, we also encourage sobriety measures to save energy this coming winter."

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know what the rules will be. The rules could change at any moment. This makes investing in your country too risky. And you won't get the investments you want."

"The message is simple: stick to the single EU-wide cap the Commission has proposed; apply the same cap to all forms of 'infra-marginal' electricity; and only apply the cap to actual revenues earned. Most wind farms in Europe earn fixed income far lower than today's wholesale electricity prices: from government contracts, PPAs or because they've hedged against lower and higher prices. Ignore this and you turn away investments in renewables. You cement Europe's dependency on fossil fuel imports. You worsen the energy crisis."

Dickson: stick to the single EU-wide cap

The proposed package includes a "solidarity contribution" from fossil fuel companies that have made significant windfall profits. These oil and gas producers will be asked to contribute at least 33 per cent of their surplus profits generated in 2022. Member States can apply higher rates. These solidarity contributions should be used to support households, to help energy-intensive industries transitioning to renewables and to fund cross-border projects.

The Commission previously mooted a price cap solely on Russian gas but the idea has been strongly opposed by states such as Austria, which still receives 50 per cent of its gas from Russia and fears retaliatory cut-offs.

The Czech Republic, which holds the rotating European Council presidency, tasked the Commission with coming up with mechanisms to cap gas prices and extend liquidity support for energy companies facing steep collateral demands.

A draft of the countries' latest negotiating document, seen by *Reuters*, would also allow countries to subject coal fired power plants to the planned revenue cap on electricity producers.

According to the Commission the proposed measures are "extraordinary in nature" and should therefore be limited in time. At the time of writing, EU diplomats were discussing the proposals and trying to find deals that EU energy ministers would be ready to approve at a September 30th meeting.

The electricity emergency tool should apply no later than December 1, 2022 and until March 31, 2023. The Commission has committed to carrying out a review of the electricity emergency tool by February 28, 2023, taking into account the electricity supply situation and electricity prices across the EU, and present a report on the main findings of that review to the Council.

European gas storage levels on target for winter but high prices will persist

- Storage levels over 85 per cent
- Additional stress to gas prices futures this winter

Junior Isles

Europe is ahead of its target to replenish gas storage levels to 80 per cent by October 1, but gas prices will likely remain high this winter, according to Wood Mackenzie.

Wood Mackenzie's 'European Gas Q3 Short Term Outlook' report found that Strong LNG and non-Russian pipeline imports have helped get Europe gas storage levels to its target at the end of August, beating expectations. A more recent figure from *Reuters* put the level at nearly 88 per cent on September 25th.

According to the Outlook, high natural gas prices will continue to drive down European demand to seven per cent below the five-year average through March, leaving a best-case scenario of storage levels at 31 per cent at winter's end, in line with the five-year average.

Commenting on the impact on prices Penny Leake, Wood Mackenzie research analyst for European gas, said: "In addition to uncertainty over gas supply from Russia, power market tightness – due to low nuclear, hydro and wind output – and the risk of electricity disruption are putting additional stress to gas prices futures this winter." The biggest risk will be winter. Leake said: "Under normal weather conditions we anticipate a rebalance of the power market after winter, which, combined with an improved gas market balance, might see gas prices dropping by more than 35 per cent trading closer to levels Europe had in late July 2022."

She added: "Europe's hope to get through this and next winter is predicated upon record LNG imports – expected to reach a 40 per cent market share in Europe next year, while Russia reduces below 10 per cent – requiring high gas prices and Europe remaining the LNG premium market globally."

With Europe pivoting towards the consumption of high-cost LNG, the direction of LNG on the spot market has also shifted from markets in Asia to European markets.

According to the data collated by Anadolu Agency from financial market statistics and infrastructure provider Refinitiv, Europe's LNG imports increased 86 per cent from June to August this year compared to the same period last year.

European countries imported about 21 billion m^3 (bcm) of LNG in the June to August period of last year, but this surged to 39.14 bcm during the same period this year.

There has been a marked fall in LNG imports to Asia this summer relative to last year, dropping from 90 bcm to approximately 83 bcm.

Global alliance to tap into offshore wind's potential

- Installed capacity to grow seven-fold in a decade
- Zero-carbon solution to energy security and jobs concerns

Nadia Weekes

Offshore wind has enormous untapped potential to drive the global energy transition and tackle the climate and energy crises, according to the multi-stakeholder Global Offshore Wind Alliance (GOWA), which aims to see installed global offshore wind capacity rise 670 per cent from 57 GW in 2021 to 380 GW in 2030.

Representatives from the International Renewable Energy Agency (IRENA), the Global Wind Energy Council (GWEC) and governments including Denmark and the US met at a public event in New York on September 19th to discuss how to unleash the potential of offshore wind.

GOWA was founded by Denmark, IRENA, and GWEC with the ambition to create a global driving force for the uptake of offshore wind through political mobilisation and the creation of a global community of practice. The aim of GOWA is for global offshore wind capacity to reach a minimum of 380 GW by 2030, with 35 GW on average each year across the 2020s and a minimum of 70 GW each year from 2030, culminating in 2000 GW by 2050.

According to forecasts by the International Energy Agency (IEA) and IRENA, 2000 GW of installed offshore wind capacity will be needed in order to limit the rise in global temperatures to 1.5°C and achieve net zero by 2050. Yet, global installed offshore wind capacity only totalled 57 GW in 2021.

Danish Minister for Climate, Energy and Utilities, Dan Jørgensen said at the launch event: "A massive increase in energy from offshore wind is key to fight climate change, phase out fossil fuels and strengthen energy security. We cannot do it alone but must work together across the public and private sectors as well as across countries and regions."

As a pioneer in offshore wind, having installed its first turbines in waters off Copenhagen in 1991, Denmark has "extensive experience in the field and a long history of sharing it with the rest of the world", he added.

Francesco La Camera, IRENA's Director-General said that offshore wind farms built at gigawatt scale would make "an important addition to the world's technology portfolio". He said that a "blue economy" driven by renewables would bring socio-economic benefits to coastal communities globally.

GWEC's CEO, Ben Backwell said this was a crucial time for this type of alliance, with energy security and cost of living crises compounding runaway global heating. "With offshore wind, the world has an effective solution for adding large amounts of zero carbon power at affordable costs, while creating jobs and new investments in industry and infrastructure all around the world," he said.

Germany still looking at nuclear to stave off energy crisis

Germany's hopes of keeping two of its three remaining operating nuclear plants on standby in in order to stave off potential power shortages this winter have been thrown a lifeline by E.On.

In late September, the German energy giant's wholly-owned subsidiary PreussenElektra GmbH reached an agreement with the Federal Ministry of Economics and Climate Action (BMWK) and the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) on the cornerstones of a potential continued operation of the Isar 2 nuclear power plant beyond December 31, 2022.

The news will come as a relief to the government, which had been told just weeks earlier by E.On that keeping the plant on standby was not an option.

At the beginning of September, the government said it was rethinking its plan to close the last of its nuclear plants in December, with German Economic Minister Robert Habeck pushing to keep the plants online for longer.

The ministry told *Bloomberg* it was looking at a potential draft law to facilitate the extension, and had also changed the parameters for stress tests on the country's energy security which would make prolonging the reactors a viable option.

Habeck said that two reactors – Isar 2 in Bavaria and Neckarwestheim north of Stuttgart – will be kept on standby until mid-April next year. A third plant, Emsland near the Dutch border, will be powered down as planned in December. No new fuel rods will be purchased for the two plants, he said.

Shortly after Habeck's announcement, however, E.On told the government that nuclear power plants in their technical design were not reserve power plants that can be variably switched on and off.

Following weeks of "close exchange" with the German economy ministry "to find an implementable solution", the two sides have reached an agreement.

E.On CEO Leonhard Birnbaum, said: "E.On has always declared that it supports the German government's efforts to ensure a secure energy supply within the scope of our possibilities. That is why we have always been willing to discuss the potential continued operation of the Isar 2 nuclear power plant, if the German government requested it."

The company says that, after the corresponding preparations, the plant will go into a short shutdown in order to carry out an overhaul of the pressuriser pilot valves. After the restart, the plant can continue to operate with the existing reactor core until probably March 2023.

The federal government will decide on the actual call-up by the beginning of December at the latest. Should the plant be called up, PreussenElektra would earn electricity market revenues for approximately 2 TWh of electricity production with Isar 2 next year. These potential revenues must be set against the additional costs arising from the extension and the legal regulations that would then potentially apply to the treatment of electricity market revenues. E.On plans to use any possible revenues from continued operation to support the *Energiewende*, or energy transition. If there is no call, the federal government will reimburse all costs incurred in preparing continued operation.

A legislative procedure will be initiated in the short-term, and work is being done in parallel on a contractual safeguard.

■ The newest nuclear reactor in Europe, the Olkiluoto 3 plant unit (OL3), exceeded the landmark 1000 MW power mark last month, easing the strain on Finland's electricity grid. The plant unit was connected to the national grid in March 2022. After the test production phase, regular electricity production is expected to start in December.

Investors flood in as Eletrobras privatised

- Eletrobras sell-off raises $6 billion but Presidential candidate maintains option to renationalise
- New entrants across renewables sector

Janet Wood

Brazilian President Jair Bolsonaro has completed plans to effectively privatise power utility Eletrobras. The administration raised almost $6 billon in a stock sale that has reduced the state's ownership below 50 per cent, down from 72 per cent. It was the third-largest equity capital markets deal globally this year, behind initial public offerings by South Korea's LG Energy Solution and Dubai Electricity & Water Authority, according to Dealogic.

São Paulo-quoted shares in Eletrobras fell 5.4 per cent following the news, giving it a market capitalisation of just below $13 billion.

Bolsonaro claims shifting control of Eletrobras into private hands will unlock extra investment for infrastructure and lower bills. Critics said it will end up costing consumers more and figures close to former president Luiz Inácio Lula da Silva continue to suggest he may reverse the privatisation if he wins power in the upcoming October elections.

"It is possible to reverse it," said Guido Mantega, Finance Minister between 2006 and 2014. "I have no doubt that there are ways, even if, in the end, the shares have to be repurchased." But Fabio Coelho President of AMEC, the Brazilian association of capital markets investors, said: "It would become very expensive, almost economically unviable."

Eletrobras's generating capacity is largely hydropower. As its future is determined, other energy companies continue to expand Brazil's capacity in other technologies.

Recently Shell Energy Brasil announced plans to build up to 2.1 GW of solar PV in Minas Gerais, with construction planned to start this year.

Corio Generation, part of Macquarie's Green Investment Group, announced plans to develop five fixed-bottom offshore wind projects totalling over 5 GW with local company Servtec. They will apply for leases for five fixed-bottom projects: Costa Nordeste off the northeast coast (1.2G W); Vitoria off the southeast coast (495 MW); and Guarita (1.2 GW), Cassino (1.2GW) and Rio Grande (1.1 GW) off the south coast.

"We see huge opportunity for harnessing Brazil's ocean wind energy, bringing economic investment and green jobs to the country," said Jonathan Cole, Chief Executive of Corio Generation. He added: "This is an historic day for Corio, marking our company's entry into the Americas."

A new name in the country's wind sector is OW Brasil, previously Ventos de Atlântico. The company has been launched by Ocean Winds, and it is working on development opportunities at five project sites totalling 15.2 GW, where Ocean Winds had submitted applications for environmental permits to the country's Institute for Environment and Natural Resources.

Nova Scotia project marks Canada's first tidal stream power export

A tidal power project has begun exporting power to the grid in Nova Scotia, Canada. Sustainable Marine said it has officially powered up its tidal energy operation in Grand Passage and is ready to commence commercial operation.

The project is being supported by the government of Canada with $28.5 million in funding and the knowledge gained and lessons learned in Grand Passage, where the company has a licence to export 700 kW to the grid, will provide lessons for a bigger tidal array at Fundy Ocean Research Centre for Energy.

At this centre Nova Scotia has allocated 30 MW of capacity via demonstration permits for developers to demonstrate the effectiveness, cost and environmental effects of their tidal technologies.

Jason Hayman, Chief Executive of Sustainable Marine, said it was an "incredible milestone" and added: "We have the potential to revolutionise the Atlantic power grid entirely by tapping into the resource available to us at the Bay of Fundy."

The Bay of Fundy's huge tidal energy resource has the potential to generate 2.5 GW.

In the coming months the company will continue to operate the platform at its demonstration site at Grand Passage, gradually building up power production, to further prove the technology and environmental monitoring systems, before commencing deployments in the Minas Passage.

Mexican Gulf sees hydrogen futures pit green against blue options

BP and Linde have announced plans to install carbon capture and storage (CCS) at Linde's hydrogen production plants around Houston and on the Texas Gulf Coast. They say the project could begin producing low carbon hydrogen for the region by 2026.

The hydrogen will be sold to customers along Linde's hydrogen pipeline network to produce low carbon chemicals and fuels. BP will appraise, develop and permit the geological storage sites for permanent sequestration of the carbon dioxide, while Linde will utilise its technology to capture and compress the CO_2.

For many observers, using gas with CCS to produce hydrogen is less desirable than using renewables to produce hydrogen. Across the Gulf of Mexico, an alternative approach is in prospect.

Mexico wants to build a green hydrogen industry to meet demand of 2.7 Mt for domestic consumption and export for industries including petrochemicals, electricity generation, iron and steel, glass, chemicals, cement and mobility.

Now the Mexican Hydrogen Association has said it would require investment of $60 billion between 2025 and 2050 in a new study, 'Green Hydrogen: The energy vector to decarbonise Mexico's economy,' produced with PwC. The Association says the investment would be used to install more than 80 GW of renewable energy capacity, mainly solar and wind, as well as 51 GW of electrolysis. The electrolysis route is more expensive than gas with CCS but Joaquín Mendoza, a consultant at PwC said: "We expect cost parity to be reached by 2040."

USA opens way to large-scale solar rollout

- Biden removes tariff barriers to panel imports
- Solar farms pull in more storage projects

Janet Wood

US President Joe Biden will allow solar panel parts to be imported free of tariffs from four southeast Asian nations, boosting ambitious plans to expand solar generation in the USA.

Solar energy is among the fastest growing sources of new electric generation in the US, and southeast Asia made up around three-quarters of solar modules imported to the US in 2020, the White House said. But the threat of trade barriers for imported solar panel components from Cambodia, Malaysia, Thailand and Vietnam, supported by some domestic PV producers, had been strongly opposed by developers who said it was having a "chilling" effect on the sector and could derail efforts to green the country's electricity grid.

In May, energy consultancy Rystad Energy said up to 17.5 GW of the planned solar installations in 2022 – almost two-thirds of the total – were in jeopardy because of the commerce department's investigation. Panels from the four countries accounted for 85 per cent of all solar power capacity imported to the US last year.

The decision is also expected to boost storage. "The Biden Administration's recent decision to pause AD/CVD [anti-dumping/countervailing duty] solar tariffs for two years restores predictability to both the solar and energy storage markets. With well over 50 per cent of utility storage projects being paired with solar farms, this important executive action will help the energy storage market continue to accelerate," said John Hensley, Vice President of Research and Analytics at ACP.

In the last quarter the US added nearly 3 GW of new solar capacity, while wind installations declined 3 per cent to 2865 MW, but a further 8.6 GW of solar projects are said to be delayed.

Among recent major solar project announcements, the US Bureau of Land Management has issued a notice to proceed on construction for two solar projects in California, which will deliver 465 MW of solar capacity and 400 MW of battery energy storage. The projects are the 265 MW Arica solar project and 200 MW Victory Pass solar project.

Meanwhile in New York Governor Kathy Hochul announced awards for 22 large-scale solar and energy storage projects to be constructed across the state. Together, they will add more than 2 GW of solar and 160 MW of storage to the state's grid, and bring the renewable energy portion of capacity to 66 per cent.

The initiative is said to be the state's largest land-based renewable energy procurement to date. "With the largest portfolio of projects awarded to date, New York is strengthening an already massive renewable energy pipeline that is positioned to deliver increasing amounts of clean and affordable electricity to thousands of families across the state for years to come," said Climate Action Council Co-Chair Doreen Harris.

US considering how to replace Russian nuclear fuel

The Biden administration recently announced a $4.3 billion plan to buy enriched uranium directly from domestic producers for the US nuclear power fleet.

Following the invasion of Ukraine western companies have been reconsidering their use of Russian-supplied nuclear fuel services. Alexei Likhachev, Chief Executive of Russian fuel supplier Rosatom, recently said he does not think it is technically possible for western customers to refuse Russian nuclear fuel, and it would require ten years for western suppliers to be able to develop fuel assemblies to replace its supply. However, Sweden's Vattenfall recently refused to receive a planned supply of Russian nuclear fuel for its nuclear power plants.

John Ciampaglia, Chief Executive of Sprott Asset Management, said: "While Russia only provides 15 per cent of global uranium production which is the feedstock for nuclear fuel, it accounts for a significant amount of global capacity in the nuclear fuel cycle with 27 per cent of conversion and 39 per cent of enrichment service capacity." He said western suppliers of these services will not ramp up production without long term contracts in place from utilities.

Indonesia bans coal in pivot to renewables

- Licenses stopped for new coal plants
- PLN adopts measures to help mitigate climate change

Syed Ali

Indonesia's President Joko "Jokowi" Widodo has issued a new presidential regulation that stops the issuing of licenses for new coal fired power plants as part of a move to transition to new and renewable energy sources in the country.

The 2022 Presidential Regulation about Acceleration of Renewable Energy Developments unveiled on September 14, 2022, also requires the energy minister to draw up a roadmap to accelerate the closure of all coal fired power plants before 2050.

The regulation, however, leaves some loopholes that still allow companies to build new coal fired power plants over the next few years. Those that have secured their permits before the presidential regulation will be allowed to continue. Also, coal fired plants integrated with any projects listed in the government's National Strategic Projects list will be allowed to proceed.

The regulation said that to achieve the emission reduction target, the exempted coal fired power plants could develop new technology, buy carbon offsets, or mix their power generation with renewable energy. The power plants also have to agree to cease operation by 2050.

At the end of August state-owned electricity provider PT PLN (Persero) said it has taken several measures to help mitigate climate change, including optimising the operation of existing power plants and using more environmentally friendly fuel for the plants.

"Indonesia has committed to reducing carbon emissions to achieve the 17th sustainable development goal (SDG) and achieve net zero emissions by 2060," Director of Corporate Planning at PT PLN Evy Haryadi said in a statement.

Haryadi said that to achieve carbon neutrality, PLN is trying to implement 75 per cent of the new and renewable energy mix of the installed electricity capacity of 413 GW, which will also be supported by 19 GW of electricity interconnections from Sumatra, Kalimantan, and Nusa Tenggara regions to Java region.

The company is also planning to implement carbon capture and storage (CCS) technology for thermal power plants (PLTUs), cut off the use of PLTUs early, as well as apply new technologies such as biomass and hydrogen, he added.

The state-owned enterprise will require $614 billion in investment to achieve the carbon neutral target by 2060, of which around $596 billion would be used to improve electricity capacity, while the remaining investment would be utilised to strengthen electricity interconnection.

Transitioning to clean energy is a key opportunity for Indonesia to diversify its economy while making its energy supplies more secure and affordable. A recent report from the International Energy Agency (IEA) noted Indonesia has a viable path to reaching its target of net zero emissions by 2060 but key policy reforms and international support will be crucial to its success.

"Indonesia has the opportunity to show the world that even for a country that relies heavily on fossil fuel exports, a pathway to net zero emissions is not only feasible but also beneficial," said IEA Executive Director Fatih Birol. "We must be clear-eyed about the challenges, especially in areas that depend on the coal industry, but the economic opportunities more than compensate for the costs."

Pakistan decarbonisation plan banks on hydro and solar

Pakistan's government is embarking on an ambitious plan to replace electricity generated by expensive fossil fuel with clean, low-cost hydropower and solar.

In September the government outlined plans for 9000 MW of hydropower that would help replace thermal-based electricity, which currently represents around 70 per cent of the total energy mix.

The government has announced several projects, including the 4500 MW Diamer Basha dam, the Dasu project (4200 MW), the Tarbela 5th Extension (1530 MW), as well as the Mohmand dam and Keyal Khwar hydropower projects.

These projects are mostly 'multi-purposed'– in addition to generating low cost hydropower, they would also store water thereby helping to mitigate flash floods, which wreaked havoc across the entire country during the current monsoon season.

Asian Infrastructure Investment Bank (AIIB) has shown keen interest in financing Pakistan's Water and Power Development Authority (Wapda) projects and says it will remain closely associated with the authority. "AIIB will look into possibilities of financial assistance for Wapda projects," said AIIB Director General (Investments) Supee Teravaninthorn.

At the start of September Prime Minister Shehbaz Sharif also gave the go-ahead for the execution of 10 000 MW of solar energy projects to reduce the import bill of costly diesel and furnace oil.

"Our National Solar Energy Initiative is aimed at substituting costly energy with cheap solar power, which will provide massive relief to people and save precious foreign exchange," said Sharif.

In the first phase, the solar energy would be supplied to government buildings, tube wells that currently operate on electricity and diesel for pumping drinking water, and domestic electricity consumers with low power consumption.

Nuclear will be key to carbon reduction as South Korea revises green energy taxonomy

South Korea is to reduce its renewables target and put greater focus on nuclear energy in the revised version of its national green taxonomy, known as 'K-Taxonomy'.

The country established the K-Taxonomy guideline last year to provide principles and standards on environmentally sustainable economic activities, but the Ministry of Environment has now revised the guideline to include nuclear energy in the green economic activities that are composed of the 'green' and the 'transition' sectors.

The green sector refers to the truly green economic activities essential for carbon neutrality, including research and development on nuclear energy such as small modular reactor (SMR) and accident-tolerant fuel (ATF).

The transition sector refers to activities temporarily included in the green taxonomy as an intermediary step toward carbon neutrality, including the construction of new nuclear power plants.

The inclusion of nuclear activities will be dependent on specific conditions and requirements, such as legislation on the ATF use and the safe storage and treatment of high-level radioactive waste, the ministry said.

The revision reflects the decision in late August to reverse the previous government's policy to gradually reduce dependence on nuclear power. The change in approach was outlined in a new draft of the 10th Basic Plan for Long-term Electricity (BPLE). This will see the share of nuclear power generation increase to 32.8 per cent by 2030, up from the 23.9 per cent target announced a year earlier.

The government says it plans to continue operating nuclear power plants whose operating licenses have expired, and to increase power generation through six new nuclear power plants, including the newly built Units 1 and 2 of the Shin Hanul nuclear power plant.

Conversely, the share of renewable energy will be greatly reduced. The BPLE subcommittee has decided to reduce the share of renewable energy generation from 30.2 per cent to 21.5 per cent by 2036.

According to a report compiled by the office of Rep. Kim Yong-min of the main opposition Democratic Party, six affiliates of the state-run Korea Electric Power Corp. (KEPCO) plan to cut their investment in renewable energy over the next five years as they are under pressure to improve their worsening financial health.

EU seeks to reduce India's dependence on Russia

The EU is proposing a deeper partnership with India on hydrogen and solar power as it attempts to present India with viable energy alternatives to Russian fuel.

Visiting New Delhi last month, President of the European Commission Ursula von der Leyen offered Indian an alliance that would allow both to work for the configuration of the "new world".

Addressing the First EU-India Green Hydrogen Forum, European Commissioner for Energy Kadri Simson said the energy system had been "impacted" by the Russian invasion of Ukraine. She said: "Whether we like it or not, the game - and our global energy system – has changed."

India has been neutral toward Russia's military intervention in Ukraine despite calls by western powers to oppose it. New Delhi has also increased fuel purchases from Moscow in recent months.

As a result of the invasion, the EU, which is heavily dependent on fossil fuels from Russian, has stepped up its green energy ambitions.

Kadri told the forum that the EU had ramped up its efforts on hydrogen, noting that "solar and hydrogen energy are both game changers for the energy transition".

Under its REPowerEU package, aimed at allowing the bloc to become fully independent from Russian fossil fuels, the EU has included an additional 10 million tonnes of renewable hydrogen, bringing the goal to 20 million by 2030.

"We don't just see this as a reaction to what is going on in the world or the environment, it's also an investment agenda. At the EU level, we are expecting investments in the range of €320-460 billion."

Indian Power Minister RK Singh, meanwhile, highlighted the Indian growth story. Noting that the country's "demand for energy is increasing," he said India has emerged as a place for foreign investment.

The EU-India hydrogen forum came as Reliance Industries' Chairman, Mukesh Ambani. unveiled his plan to shift to green hydrogen, with the aim of starting the transition by 2025.

"We aim to progressively commence [the] transition from grey hydrogen to green hydrogen by 2025, after proving our cost and performance targets," Ambani said.

He also informed that the company has partnered with Stiesdal, a climate technology company, to speed up cost reduction and commercialisation of their Pressurised Alkaline Electrolyser technology."

■ Amidst western sanctions against Moscow following its invasion of Ukraine, China's coal purchases from Russia hit a five-year high in July, surging 14 per cent from last year. After the European Union banned Russian coal on 11th August, in a bid to reduce the revenue gained by Moscow following its invasion on 24th February, Russia has targeted other buyers, such as China and India, selling at major discounts.

UK aims to boost domestic resources in response to energy crisis

■ Bills capped for domestic and business customers ■ Restrictions lifted on onshore wind and fracking

Janet Wood

The UK wind industry hopes to see a resurgence in onshore projects after the government announced a large package of new measures designed to address the crisis in energy costs and increase domestic energy supply.

Only 0.34 GW of onshore wind has gone fully operational in the last 12 months in the UK, according to new data from RenewableUK, but it reveals that the overall pipeline of onshore wind projects in the UK has increased by over 4 GW in the last twelve months to 37 GW.

RenewableUK Chief Executive Dan McGrail said: "We can't tackle the energy crisis without onshore wind – it's one of our cheapest sources of new power and once projects have the go-ahead they can be up and running within a year."

The push to open up development of domestic resources will also see tight restrictions lifted on fracking, which had been held up by concerns over earth tremors, and a new licensing round for oil and gas extraction in the North Sea. The latter had been paused during a 'Climate Compatibility Checkpoint' consultation.

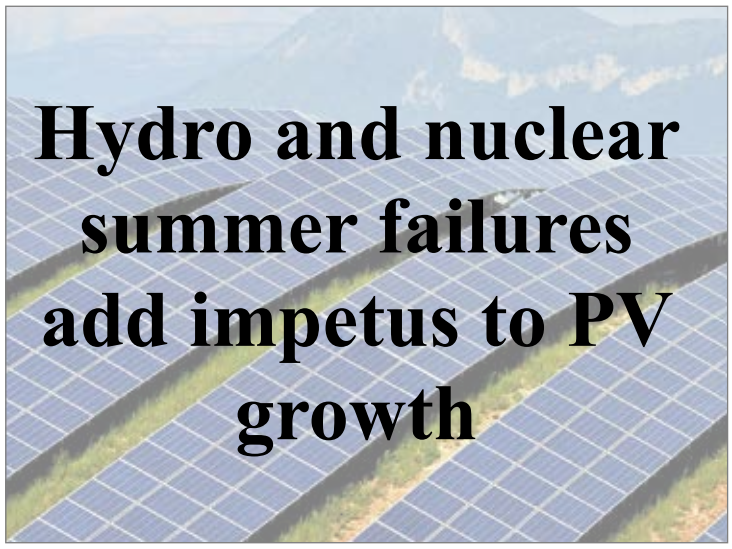
Business and Energy Secretary Jacob Rees-Mogg said strengthening with energy security is "an absolute priority". The government wants to ensure the UK is a net energy exporter by 2040. "To get there we will need to explore all avenues available to us through solar, wind, oil and gas production – so it's right that we've lifted the pause to realise any potential sources of domestic gas," said Rees-Mogg.

The announcement came alongside a long-awaited energy plan to protect UK households, businesses, and other organisations from soaring energy bills. A new 'Energy Price Guarantee' will limit household bills and there will be parallel measures for business customers.

Jonathan Geldart, Director General of the Institute of Directors, said: "This is an important intervention by the government and provides much needed short-term reassurance for the numerous firms that are facing soaring energy bills."

Prime Minister Liz Truss also announced a review to ensure the 2050 net zero target is delivered in a way that is "pro-business and pro-growth".

The UK decided against imposing one-off 'windfall taxes' on energy companies that have seen their income increase with rising power prices – including fossil fuel and renewable power generators who benefit from the Renewables Obligation (RO), which tops up power prices. An alternative that would voluntarily switch RO contracts to Contracts for Difference, which provide a stable income stream, has won support from Energy UK.



Hydro and nuclear summer failures add impetus to PV growth

Sunny weather across the EU and a boost in solar installations meant solar generation was 28 per cent higher than the previous summer, according to research from Ember, the UK environmental group. The solar boom helped lift the squeeze on gas, hydropower and nuclear sources.

Solar power generated 99.4 TWh of electricity between May and August, accounting for 12 per cent of power generation. It came as record heatwaves increased energy demand for cooling purposes.

"The fact that we… can already generate above 10 per cent of EU electricity from solar gives hope for a transition to cleaner energy and better energy security," said Paweł Czyżak, Senior Analyst at Ember and one of the authors of the report.

The biggest solar share was in the Netherlands (23 per cent). Germany had the second largest share (19 per cent) and is looking to boost capacity, but it accepted only proposals for 201.04 MW of rooftop capacity in a new tender that sought 766 MW of capacity. The next round of the auction will take place on December 1.

Meanwhile the Italian Ministry of Agricultural, Food and Forestry Policies has opened a €1.5 billion incentive scheme to support the construction of 375 MW of rooftop PV on agricultural premises, while Switzerland imposed a solar rooftop requirement for new buildings.

Europe rushes to install LNG capacity to replace Russian supply

The National Bank of Greece has financed a €450 million floating storage and regasification terminal off the coast of Alexandroupolis in Northern Greece. The project will create a new 'energy gateway' in southeastern and central Europe, through existing and new export routes to Bulgaria and North Macedonia.

The financing, which was completed on June 17, includes a €283 million bond loan and a €166 million state grant. It covers the construction of the floating storage and regasification terminal, which will regasify natural gas and transfer it onto Greece and other areas of southeastern Europe.

Norton Rose Fulbright advised on the deal. Partner Yianni Cheilas said: "This strategically important project will increase Greece's exports to the markets of southeastern and central Europe, and also enhance the country's role as an energy hub in the region… It is a time of great uncertainty and high volatility in the geopolitical and energy landscape, but this deal sends a strong signal on the future of the energy transition in Europe and the geo-strategic collaboration between stakeholders in the region."

It comes as Germany chartered its fifth floating storage and regasification terminal, in its effort to meet winter gas needs while bypassing pipeline natural gas supplies from Russia.

EU supports hydrogen's move from test bed to market

■ Electrolysers start to build operational experience
■ Danish tender planned for power-to-X

European Commission President Ursula von der Leyen has announced plans for a European hydrogen bank to guarantee the purchase of hydrogen in the European Union. She said: "We need to create a new market for hydrogen. This is how we will build the economy of the future in Europe."

Von der Leyen added: "Hydrogen can be a game changer for Europe. That is why we are going to create a new European Hydrogen Bank. This could invest €3 billion to help build the future hydrogen market."

The announcement comes as early investment in green hydrogen plants begins to bear fruit.

In the Wunsiedel Energy Park, one of Germany's largest green hydrogen generation plants has been commissioned by Siemens one year after the ground-breaking ceremony.

Up to 1350 t of green hydrogen can now be generated annually from renewable solar and wind power via an 8.75 MW electrolyser.

Specialist hydrogen developer Lhyfe, which inaugurated its first green hydrogen production plant in France in September 2021, has ambitions for more than 3 GW of electrolytic hydrogen in operation by 2030. It recently said its current sales pipeline consists of 93 projects throughout Europe – 20 of which are at an advanced development stage and due by 2026.

A research programme, which started in 2019, should also lead to the start of a test phase in real conditions for the world's first floating electrolyser connected to a floating wind farm, in autumn 2022. Recently Lhyfe launched in the UK, saying it wanted to make use of the huge offshore wind potential in the North Sea.

Colin Brown, UK Country Manager of Lhyfe, said: "Renewable green hydrogen production at scale is one of the key solutions to help the UK reach its net zero targets."

Meanwhile Denmark has set out in its PtX strategy, aiming to reach between 4-6 GW of electrolysis capacity by 2030 to produce hydrogen that can be converted to other fuels such as ammonia. European Energy's power-to-X plant will be ready in Esbjerg in the first half of 2023 and will supply green hydrogen to the Port of Esbjerg, as well as to industrial customers in Denmark.

Now the Danish Energy Agency (DEA) is working towards the first PtX tender in Denmark and will hold a stakeholder meeting to discuss tender timeline and framework. The tender will procure green hydrogen and clean fuel solutions produced by using renewable energy sources such as offshore wind, with €168 million to be made available in support.

UK regions step up floating wind rollout

Scotland has broken records for offshore wind auctions and for floating wind capacity with floating wind projects totalling 17 871 MW and the recent ScotWind round yielding nearly 30 GW.

"The Scottish government sees offshore wind – and the hydrogen production, which we hope will be enabled by offshore wind – as one of the most important economic and environmental opportunities we have. It can reduce our carbon emissions, improve our energy security, and create tens of thousands of high quality jobs," said First Minister Nicola Sturgeon.

The comment came as three additional projects were offered seabed agreements by Crown Estate Scotland after a 'clearing' process that made available an area east of Shetland for applicants who met the required standards but did not secure their chosen location earlier in the leasing process.

In April, former Prime Minister Boris Johnson's British Energy Security Strategy announced plans for a four-fold expansion of offshore wind to 50 GW by 2030, of which at least a tenth is to take the form of floating wind farms.

Other floating wind farm sites are likely to be off the coasts of Cornwall and Pembrokeshire after Crown Estates identified a clutch of sites in the Celtic Sea that could host them.

Decline of global coal will be slow and uneven

Global demand for thermal coal is set to decline after peaking in 2024 as the energy transition gathers momentum. **Abhishek Dangra,** Senior Director, Asia Pacific Corporate Ratings, S&P Global Ratings.

According to S&P Global Commodity Insights' reference scenario, coal's share of primary energy is set to reduce to 21 per cent by 2030 – from about 25 per cent at present – and continue to trend down thereafter. But the decline will be slow and uneven, and coal fired generation will remain important in Asia-Pacific.

Furthermore, the energy transition has become more complex because of security of supply and geopolitical considerations, exacerbated by the ongoing Russia-Ukraine conflict.

Coal demand is declining in western markets as renewables increasingly replace coal-fuelled power. In the US, the share of coal in power generation is expected to fall from close to 20 per cent in recent years to 12 per cent by 2030, according to S&P Global Commodity Insights. Moreover, the EU's climate and emission reduction policies are expected to reduce coal fired power's share of the energy mix to less than 5 per cent by 2030 from 15 per cent in 2020.

Financial markets are independently taking action on the energy transition alongside, and often ahead of, government-led efforts to reduce coal consumption. The pool of funding for coal projects is shrinking, and coal-related sectors face mounting credit risks and financing costs. Even so, the current focus on energy security and higher energy prices is creating some hesitation among investors. Indeed, both in Europe and the US, such concerns could temporarily delay the retirement of certain coal plants.

Accounting for 70 per cent of the world's coal demand between them, both China and India expect a strong increase in power demand as their economies continue to grow – a reduction in Asia-Pacific coal consumption will prove challenging. Among large Asian economies, coal is still seen as the most affordable baseload option for meeting new electricity demand, notwithstanding the present focus on energy security. What's more, the region's coal fleets are relatively new: many plants were built within the last 10 years, and significant closures are unlikely before 2030.

Looking ahead, the economic and technical feasibility of carbon capture, usage, and storage (CCUS) technology will likely determine the ability of countries like China, India, and Indonesia to meet their net zero goals. For the time being, however, without strong carbon pricing or policy mandates, CCUS technology is unlikely to be applied in power generation at utility scale.

Coal will continue to play a different role within each country's energy mix depending on its unique circumstances. In China, for instance, the rapid deployment of renewables will reduce the share of coal fired generation to 51 per cent from two-thirds by the end of the decade. India, on the other hand, will likely miss its 2022 renewable capacity targets, and coal-fired generation will still grow this decade to meet soaring demand.

Dubai to open world's largest waste-to-energy plant

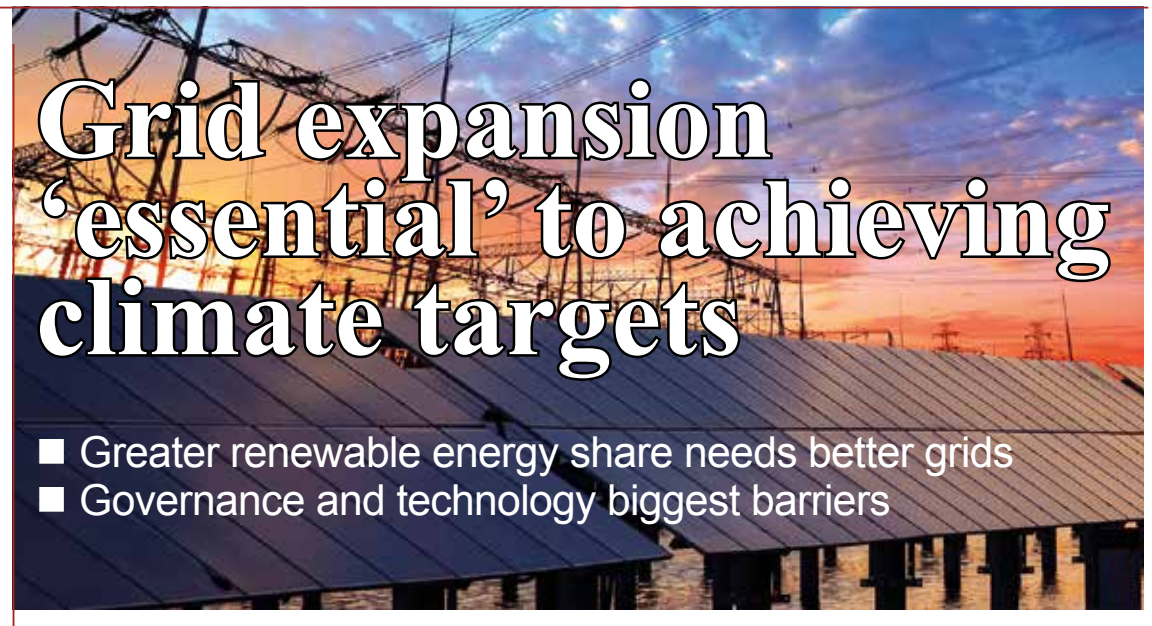
Completion of the new Dubai Waste Management Centre (DWMC) is nearly complete, resulting in a facility capable of converting 45 per cent of the emirate's municipal waste – equivalent to about 5600 tonnes of solid waste a day – into renewable energy.

Located in Dubai's industrial Al Warsan area, the plant covers an area of 400 000 m^2. The project's first phase, operating at 40 per cent, will be complete next year, while full operations are planned to begin in 2024. The plant is expected to feed the local electricity grid with 215 MWh of energy a year, making it the largest waste-to-energy project in the world.

DWMC began construction last year. It deploys Japanese and Swiss technologies for the treatment process. The centre will receive around 1000 truckloads of waste daily, with a capacity to accommodate 88 trucks per hour.

Five treatment lines will use more than 12 000 air filters to treat emissions. Burnt waste will produce around 1000 tonnes of bottom ash, to be recycled and used in infrastructure projects.

Dubai Municipality has developed an integrated 20-year strategic plan for solid waste management. The project will contribute to the municipality's objective of completely diverting waste from landfills by 2030.



Grid expansion 'essential' to achieving climate targets

- Greater renewable energy share needs better grids
- Governance and technology biggest barriers

Nadia Weekes

Energy industry leaders see an urgent need for greater investment in power grids to better connect regions, secure reliable distribution of resources and meet climate targets, according to analysis by Norway-headquartered registrar and classification society DNV.

Three-quarters (76 per cent) of the 400 senior energy professionals contacted in 75 countries said existing grid infrastructure is inadequate to connect renewable energy sources to areas of high demand. DNV predicts that smart grid implementation will not happen quickly enough to support the energy transition without significant investment.

Many energy leaders consider grid capacity expansion the most important priority to meet climate targets in Europe today, and increasingly over the next five years in North America and the Asia-Pacific region.

Respondents to the survey expect investment to increase generally in the year ahead in technologies such as battery energy storage systems, commercial solar integration and electric vehicle infrastructure.

Smart grids, automation and policy reforms are expected to be the most powerful enablers of a successful energy transition, where success achieves a balance between speed, quality, stability and costs.

The two biggest barriers to a faster transition are split between governance and technological issues. A lack of policy or government support is the top barrier, closely followed by the capacity constraints of existing grid infrastructure.

"Power grids are the backbone of our energy system and crucial for the rise of renewable energy and achieving the climate goals," said Ditlev Engel, CEO of Energy Systems at DNV. "We need huge investments to enable the integration of renewable energy sources, optimise energy storage facilities, expand the system, and achieve energy security."

DNV predicts that electricity will double as a share of final global energy demand, from 19 per cent to 38 per cent, within the next 30 years, calling for a faster rollout of actionable regulatory plans that support the level of investment needed for a clean energy future.

Kyrgyzstan plans four hydropower plants

State-owned Kyrgyz Electric Stations OJSC has signed a Memorandum of Understanding (MoU) with Kazakhstan's Orient Trade Investment Company to build and operate four hydroelectric power plants (HPPs) on Kyrgyzstan's Naryn River.

The four projects, Alabuga, Karabulun 1, Karabulun 2 and Toguztoro, are to be completed within five or six years and will have a total capacity of 1160 MW. Estimated construction cost is more than $1 billion.

The Director General of Kyrgyz Electric Stations OJSC, Taalaibek Baigaziev, said the MoU will drive development of the country's hydropower potential and strengthen cooperation between Kyrgyzstan and Kazakhstan in the water and energy sector.

The head of the Kazakh company, Rasul Teimurov, said the project would be the next step in the Kazakh-Kyrgyz investment partnership. The Ambassador of Kazakhstan to Kyrgyzstan, Rapil Zhoshybaev, said the project would not only allow the two countries to ensure energy security in the region, but also encourage the business community to invest in hydropower projects and strengthen bilateral trade and economic cooperation.

Qatar embarks on major solar power push

Qatar is to launch two major solar projects that will more than double its energy output from renewable sources within two years, according to Energy Minister Saad Sherida al-Kaabi.

Al-Kaabi said this was a significant step in efforts to "increase the reliance on high-efficiency renewable energy" in the Gulf state, which is one of the world's biggest liquefied natural gas producers.

The new plants at Mesaieed and Ras Laffan will take Qatar's solar capacity to 1.67 GW by the end of 2024. While lagging behind other Gulf states in the solar race, Qatar has a target of 5 GW of solar energy capacity by 2035.

Last month, the 800 MW Al-Kharsaah solar farm was connected to the national energy grid. It is expected to be fully operational before the start of the World Cup football tournament on 20 November 2022.

South Korean conglomerate Samsung will lead the construction of the new solar capacity, with an initial investment of $800 million to build the two solar power plants, with a total capacity of 875 MW.

The project involves building a 417 MW solar power plant in Mesaieed and a 458 MW project in Ras Laffan. Around 1.6 million solar panels will be installed in total. The two plants will begin construction this autumn and are expected to start generating electricity by the end of 2024.

QatarEnergy plans to utilise the output from the solar plants to reduce its greenhouse gas emissions from its facilities in both cities, including its liquefied natural gas expansion projects in North Field East and North Field South.

European utilities continue to struggle as energy crisis deepens

- Uniper nationalised after further €8 billion rescue package
- Fortum and Axpo secure lines of credit

Junior Isles

Several major European energy companies are being supported by their governments to protect them from default or failure as they struggle with soaring gas prices exacerbated by Russia's invasion of Ukraine.

In September, German energy company, Uniper, once Europe's biggest importer of Russian gas, said it was in final discussions for a new rescue package, in which the German government would provide a further €8 billion of capital and acquire Finnish energy company Fortum's majority shareholding in the utility. Uniper, on the brink of insolvency, will now be nationalised after Russia cut supplies of natural gas to Europe, forcing it to buy more expensive gas on the spot market in order to satisfy its supply contracts.

"As a result, it is envisaged that the federal government will obtain a significant majority stake in Uniper," the company said.

It is the latest bailout for the company, which received €15 billion from the government in July in exchange for a 30 per cent stake. The utility called for further support in August, raising the bill for its bailout to €19 billion.

Uniper said that since the July deal, Europe's energy crisis had "escalated further" thanks to Russia's move on September 3 to suspend indefinitely all gas shipments through the Nord Stream 1 pipeline connecting Russia to Germany.

Uniper reported a €12.3 billion first-half loss this year, among the largest of any German company in history.

With the government desperate to prevent a collapse of the whole German energy sector, Fortum confirmed that negotiations over a sale of its shares to the German government were in "the final stages". This includes the return to Fortum of the financing it had already provided to Uniper, previously estimated at about €8 billion.

In September, Germany pledged to re-purpose a €67 billion Covid-19 bailout fund to support struggling energy companies amid concerns that soaring gas prices will trigger a wave of insolvencies.

Peter McNally, Global lead for Energy at international research company Third Bridge, commented: "The European energy crisis has proved to be too big for many companies to handle independently, and this transaction marks the latest chapter in a period of increased state intervention. This era began with France's announced nationalisation of Électricité de France this summer and continued with other subsidies across the European continent."

Meanwhile Wien Energie, Austria's largest energy company, said wholesale gas and power prices were rising so fast that it was now having difficulty financing its operations. The company, which supplies gas and electricity to about 2 million domestic customers, said it was in discussions with the government "to ensure a stable overall situation for energy supply in Vienna and all of Austria."

Earlier last month,. Finland and Switzerland agreed liquidity support to electricity producers to avert what the Finnish economy minister called "all the ingredients for the energy sector's version of Lehman Brothers".

Fortum agreed to a €2.35 billion liquidity facility with a state-owned holding company at an annual interest cost of 14.2 per cent. Meanwhile, publicly-owned Swiss electricity company Axpo, which requested temporary government help, will have access to credit line of CHF4 billion ($4.1 billion) to ensure liquidity amid the energy crisis.

Nuclear outages hit EDF profit forecast

Core profits for French utility EDF are forecasted take a €29 billion hit this year from outages at France's nuclear reactors. The company's forecast is a sharp increase on its previous forecast and comes as the company is on the verge of full renationalisation.

EDF had previously estimated the hit to its earnings before interest, taxes, depreciation and amortisation at €24 billion for 2022. But with 26 of its 56 nuclear reactors offline, generation output has been pushed to a near all-time low. The company now estimates it will produce "on the low end of a range between 280-300 TWh" of electricity from its nuclear plants this year, well short of the 360 TWh generated in 2021. This has forced the utility to purchase expensive electricity from wholesale markets.

The group has come under government pressure to get its reactors running again for the winter and fix the corrosion issues discovered last December as quickly as possible. It has said restarts are on track and capacity should return to last winter's levels, to 45-50 GW.

EDF's finances were also impacted this year by government measures to cap electricity bills for households. The caps on price rises will be extended into 2023, with power bill increases limited to 15 per cent, although it is unclear whether EDF will be made to shoulder some of the cost of the measure.

Meanwhile, the country's operator RTE has warned France faces heightened strain on its electricity system from October onwards and urged consumers to cut their energy usage. RTE ruled out the risk of total blackouts in France even in the harshest of conditions, but said some localised, temporary power cuts could be needed in extreme scenarios.

Key hydrogen collaborations drive industry forward

Several major agreements signed last month look set to accelerate the global production and uptake of hydrogen as an energy source.

In mid-September Siemens Smart Infrastructure and Shell Global Solutions International BV signed a Memorandum of Understanding (MoU) to collaborate on developing projects that produce green hydrogen for industrial applications at Shell and its customers, as well as enhancing collaboration in the areas of biofuels and circular chemistry.

The partnership, inked with Siemens' Electrification and Automation business unit, has the potential to strengthen synergies for both parties said the companies.

"Siemens is committed to decoupling electrification from fossil fuel resources. Partnerships are key to driving this effort and transitioning towards sustainable energy supplies," said Stephan May, CEO of Electrification and Automation at Siemens Smart Infrastructure. "The partnership with Shell fits perfectly with Siemens' vision of electrifying the world, while helping industry and infrastructure customers reduce their carbon footprint and achieve their sustainability goals."

Graham Henley, Senior Vice President Engineering & Project Capability at Shell, added: "Siemens' broad range of expertise in electrification and automation, together with Shell's engineering and project delivery capability and ambition in the energy transition will prove to be a powerful combination."

The MoU stems from this relationship and from working together on several projects since 2010. One of the key milestones advancing green hydrogen is the recently announced construction of Shell's Holland Hydrogen 1 (HH1) project on the Maasvlakte in Rotterdam. With a capacity of 200 MW and 60 tons of hydrogen per day, HH1 is planned to be one of the largest green hydrogen production plants in the world and the biggest in Europe.

The announcement came as Topsoe and First Ammonia signed a 5 GW launch company agreement for the reservation of first-of-a-kind, industrial-scale, solid oxide electrolyser cell (SOEC) to produce green ammonia, a fuel for transportation, power storage and generation, and fertiliser

According to Topsoe, this is shaping up to be the largest agreement in the world, to date, for any type of electrolyser and will displace almost 5 billion cubic metres of natural gas and eliminate 13 million tonnes of CO_2 emissions per year

The first 500 MW of capacity will be installed in the world's first commercial-scale green ammonia plants at sites in Northern Germany and Southwestern United States.

Demand for hydrogen continues to increase as more countries strive for greater energy independence and organisations push towards zero carbon emissions.

In late August Plug Power Inc., a leading provider of turnkey hydrogen solutions for the global green hydrogen economy, signed a hydrogen supply deal with Amazon to provide liquid green hydrogen starting in 2025 to help decarbonise Amazon's operations as part of its commitment to be net zero carbon by 2040.

"Amazon is proud to be an early adopter of green hydrogen given its potential to decarbonise hard-to-abate sectors like long-haul trucking, steel manufacturing, aviation, and ocean shipping," said Kara Hurst, Vice President of Worldwide Sustainability at Amazon.

Siemens Gamesa blocks GE Haliade-X sales in US

GE has been banned from selling its Haliade-X offshore wind turbines in the US after a jury in Boston found in June that the wind turbine infringed on a patent held by Spanish-German wind turbine manufacturer Siemens Gamesa Renewable Energy (SGRE).

Two projects, however, have been exempted from the ruling – the 804 MW Vineyard Wind 1 off Massachusetts and the 1.1 GW Ocean Wind 1 currently being built off New Jersey. GE will pay Siemens Gamesa a royalty of $30 000 per megawatt of rated capacity for each of the 62 Haliade-X wind turbines installed on Vineyard Wind 1, as determined by the jury back in June.

The patent in question is "directed generally to a wind turbine, and specifically to a novel structural support arrangement for the turbine that enables wind turbines to be larger and/or handle increased loads, which in turn allows the wind turbine to generate more energy".

US District Judge William G. Young has ruled that Siemens Gamesa would "suffer irreparable injury if GE is not enjoined from infringing" the patent.

Some analysts estimate that the ruling could affect GE in future projects valued at $16.3 billion. GE has firm orders for 11 000 MW based on the Haliade-X turbine.

GE stated that it is "exploring" other versions of the turbine without SGRE patents and said it is considering filing an appeal of the ruling, which does not apply outside the US.

Americas

Polimix Energia orders 104 MW wind farm

Polimix Energia has signed an agreement with Vestas for the supply and installation of 23 V150-4.5 MW wind turbines for the Mundo Novo wind park located in São Miguel do Gostoso in the municipality of Rio Grande do Norte in the northeast of Brazil.

Vestas will also provide a 20-year Active Output Management 5000 (AOM 5000) service agreement.

Turbine delivery is planned for the third and fourth quarters of 2023, whilst commissioning is expected for the beginning of the second quarter of 2024.

Eric Rodrigues Gomes, Senior Sales Director for Vestas Brazil, said: "This order highlights the sustainable performance of Polimix Energia, as the Vestas wind turbines will power the concrete plants of the Polimix Energia group in the northeast of Brazil."

Hitachi Energy HVDC link for Québec-New York

Hitachi Energy has been awarded a contract by Transmission Developers Inc. to supply an HVDC converter station that is part of the Champlain Hudson Power Express (CHPE) HVDC interconnection between Québec, Canada and the New York City metro area in the USA.

The link will enable the delivery of hydropower between Canada and New York, contributing to New York's Climate Leadership and Community Protection Act (CLCPA), which aims for the state to be powered by 70 per cent renewable energy by 2030. CHPE is expected to reduce CO_2 emissions by 3.9 million tonnes annually.

CHPE will use Hitachi Energy's HVDC Light technology. CHPE will transfer up to 1250 MW through 600 km underground, from Hertel, Canada, through Lake Champlain and the Hudson River, to an HVDC converter station in Astoria, Queens, New York.

The complete CHPE system is expected to create over 1400 jobs during construction and, during the first 30 years of operation, deliver $50 billion in economic benefits to New York state.

Hitachi Energy will supply the HVDC Light converter station for the New York site.

Siemens Gamesa secures Sunrise Wind project

An order to supply turbines for the 924 MW Sunrise Wind offshore wind project off the coast of Montauk Point in New York state has been awarded to Siemens Gamesa Renewable Energy. Under the terms of the contract, Siemens Gamesa will supply, deliver, and install 84 units of the SG 11.0-200 DD turbines.

The project is a 50-50 joint venture between Eversource Energy and Denmark-based Ørsted.

Subject to the progress of the permitting process, the offshore wind farm could be fully operational by 2025.

Asia-Pacific

CleanMax awards Gujarat 198 MW wind project

CleanMax of India has awarded an order of 198 MW wind turbines to Chinese renewable energy conglomerate Envision Energy. This is for a wind-solar hybrid project.

Envision said that the project is one of the largest hybrid projects developed in India under the Commercial and Industrial power offtake segment, consisting of 198 MW wind and 158 MW solar capacity in Amreli, Gujarat.

Envision will supply 60 units of its EN156-3.3 MW onshore wind turbines.

The company will manufacture the nacelles and hubs for the turbines in its Pune factory in India. It will carry out operation and maintenance for the wind turbines for the life of the project, which will be commissioned by March 31, 2023.

The 60 wind turbines will produce 720 GWh annually at 41.5 per cent plant load factor.

Green hydrogen feasibility study for South Korea

Jacobs has won a contract from the South Korean offshore wind farm project developer Elenergy to complete the feasibility study for a new green hydrogen production and import facility in South Korea.

The facility will provide hydrogen for South Korea and help advance the country's plans to transition to a clean energy economy, where hydrogen will account for 33 per cent of energy consumption and 23.8 per cent of power generation by 2050.

The hydrogen production facility will be powered by wind energy sourced from the 1.5 GW Chujin offshore wind farm, currently being developed by Elenergy.

Jacobs will conduct a green hydrogen market analysis and technology review, develop the conceptual design and conduct business case assessment for setting up a green hydrogen production facility.

NHPC wins Nepal hydropower projects

The Nepali government has awarded a contract to India's National Hydro Power Corporation (NHPC) to develop two hydropower projects in Nepal. The projects include the 750 MW West Seti Hydropower Project and the 450 MW Seti River 6 Hydropower Project.

The estimated cost of the projects is $2.4 billion. NHPC plans to start a project study, which will be due in two years, prior to starting the construction work.

Philippines orders solar microgrids

The Maharlika consortium has won a contract to build 16 solar microgrids in the Philippine province of Palawan. The Maharlika consortium is led by Singaporean renewables infrastructure developer WEnergy Global (WEG), and also includes Maharlika CleanPowerHoldingsCorp(MCPHC) and CleanGrid Partners. The consortium has signed a Qualified Third Party (QTP) service contract to build microgrids in seven municipalities across the service area of the Palawan Electric Cooperative (PALECO).

Maharlika will invest $17.6 million to construct a distribution network that includes 175 km and primary and secondary power lines energised by 3.8 MW of PV and 2 MW of diesel generators. The microgrids will also use 4.2 MWh of battery storage.

Atem Ramsundersingh, CEO and Board Director of WEG, said: "Not only do microgrids facilitate access to electricity of rural communities, they also enable genuine sustainable development and resilience at the community level. The microgrids that we develop can be easily scaled and replicated."

Siemens Energy wins largest offshore connection

Green Infra Wind Energy, the renewables unit of Sembcorp, has awarded a contract to Suzlon Energy to build a 180.6 MW wind project in the Indian state of Karnataka.

Under the terms of the deal, Suzlon will install 86 units on 2.1 MW wind turbines, each with a Hybrid Lattice Tubular tower. The contractors will execute the project, including erection and commissioning, and will also provide comprehensive O&M services after commissioning. The wind farm is scheduled to be commissioned in 2024.

Europe

Vestas wins 104 MW wind order in Spain

Vestas received a 104 MW order for the Pinta y Guindalera wind farm, located in Valladolid, Spain. The contract includes supply and installation of 23 V150-4.5MW wind turbines. It also includes a 10-year Active Output Management service agreement.

The order was placed by Estudios y Proyectos Pradamap. Turbine delivery and commissioning is scheduled for completion in 2023.

The V150 blades will be manufactured at Vestas' blade factory in Daimiel, Cuidad Real, Spain.

Commenting on the order, Agustin Sanchez Tembleque, Vestas' General Manager for Spain and Portugal, said: "We would like to thank Pradamap for its trust in Vestas 4 MW platform. Our full converter technology gives our customers the reliability they require to operate in Spain's grid marked by increasing renewable energy participation."

HVDC cable tender for North Sea connections

In September, TenneT announced a tender for HVDC cables for connection systems to transport wind energy from the North Sea to land in Germany and the Netherlands as part of its 2 GW programme.

TenneT will award orders for at least ten offshore grid connections in the North Sea, including the 525 kV subsea cables that will be laid between the offshore converter platforms in the North Sea to the coast and the underground cables from the coast to the onshore converter stations. The orders will be allocated as part of cooperation for up to eight years.

This is TenneT's second large-scale EU tender in the offshore industry this year. In June, the power grid operator sought partners for the offshore converter platforms and the onshore converter stations in an auction with a total order value of up to €30 billion.

Siemens Energy to build CCGT in Italy

Siemens Energy will build an 880 MW CCGT power plant on a turnkey basis in Ostiglia, Lombardy, Italy. The project is being executed in a consortium with Italian EPC companies Fata and Demont. The utility EP Produzione is owner and operator of the plant.

The power plant will use Siemens' HL-class gas turbine technology. The unit is designed to be fired with up to 30 per cent hydrogen in addition to natural gas in the future.

The plant will use an air-cooled condenser, avoiding the need to use water from the nearby River Po for cooling.

The power plant is designed as a multi-shaft unit with the gas and steam turbines each driving their own generator. Siemens Energy's scope of supply includes an SGT5-9000HL gas turbine, an SGen5-3000W gas turbine generator, an SST5-5000 steam turbine, an SGen5-1200A steam turbine generator, an HRSG, and the T3000 control system.

The company will also provide long-term services for the plant's core components. Completion is scheduled for spring 2025.

International

Siemens to supply ADMS to Alexandria

Siemens will supply two Advanced Distribution Management System (ADMS) for Alexandria Supervisory Control Centre and West Alexandria Distribution Control Centre. It will also establish an advanced metering infrastructure for Alexandria Electricity Distribution Company (AEDC). This is Lot 1 of a JICA-funded loan.

AEDC is a subsidiary of the state-owned utility Egyptian Electricity Holding Company (EEHC), responsible for the distribution network of Alexandria Governorate, the second most populated governorate in Egypt. Siemens will implement an ADMS control centre for the West Alexandria region and a control centre to supervise all distribution control centres in Alexandria over the next 30 months.

In addition, Siemens will also supply some 300 000 smart meters, with the necessary hardware and software to establish an advanced metering infrastructure.

New Zealand wind farm awarded to Vestas

An order for the 43 MW Kaiwera Downs Wind Farm has been awarded to Vestas in partnership with Mercury. Vestas will supply ten V136-4.2 MW wind turbines in 4.3 MW operating mode for the wind power project.

Vestas will also provide a 30-year service and maintenance agreement to optimise energy production, while providing Mercury with a long-term business case certainty for the wind farm.

Delivery of the wind turbines is expected to take place in Q2 2023, with commissioning to start in Q3 2023.

50 MW Botswana solar project for Scatec

State-owned Botswana Power (BPC) has signed an agreement with Norway-based Scatec to build a 50 MW solar project in Botswana. Under the terms of the 25-year PPA, Scatec will finance, build, own and operate the solar plant and recover its investment by supplying the output to BPC.

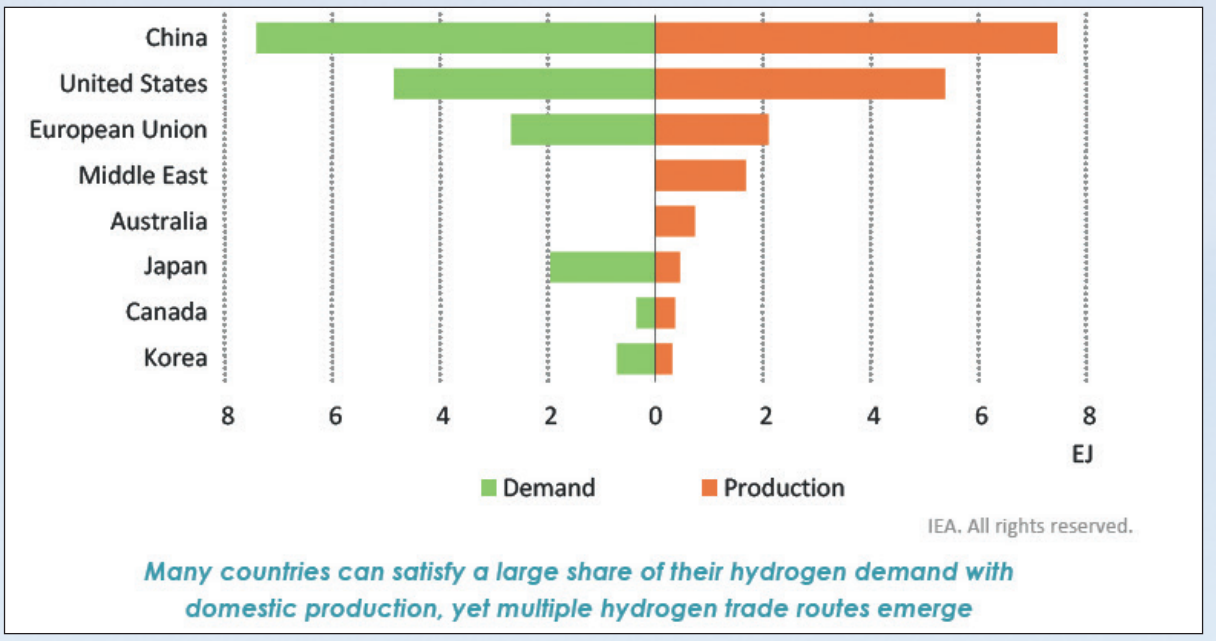
The solar power plant, which will be located near the town of Selebi-Phikwe, is due to be operational by June 2024.

QatarEnergy awards 875 MW solar contract

QatarEnergy has selected Samsung C&T as EPC contractor for two solar PV power plants with a combined capacity of 875 MW in two industrial cities in Qatar.

One 417 MW plant will be set up in the Mesaieed industrial city and another power station of 458 MW will be installed in the Ras Laffan industrial city. Both plants are scheduled to be operational by the end of 2024. Both will utilise bifacial modules and cleaning robots.

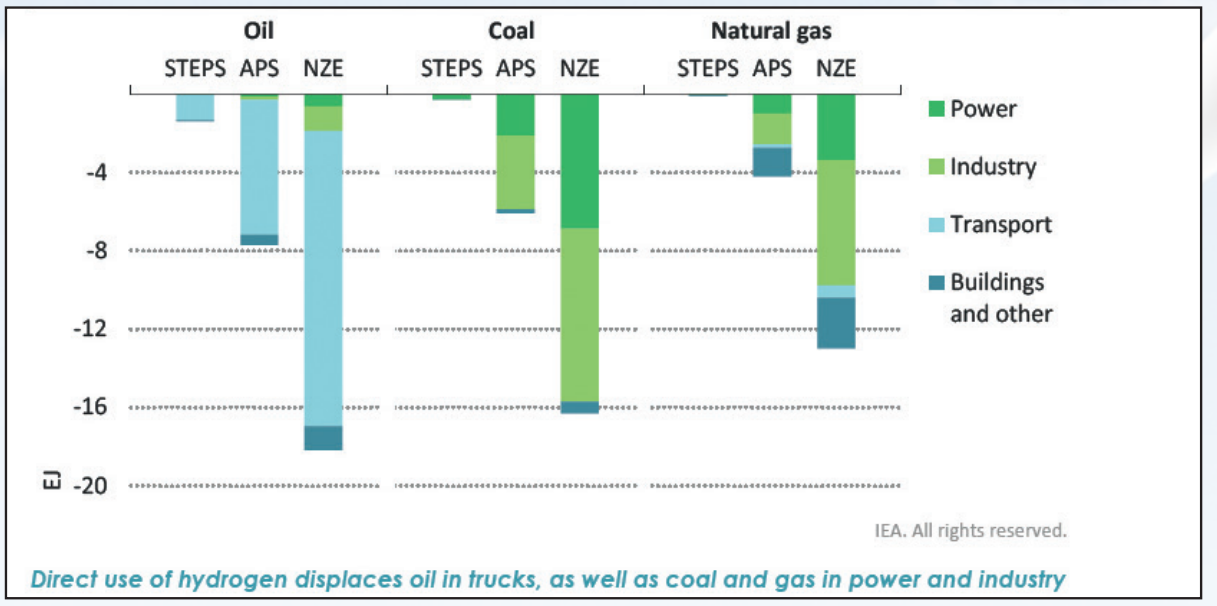
Low-carbon hydrogen demand and production in selected regions in the Announced Pledges Scenario, 2050



Many countries can satisfy a large share of their hydrogen demand with domestic production, yet multiple hydrogen trade routes emerge

World Energy Outlook 2021, © IEA/OECD, Figure 5.20, page 236

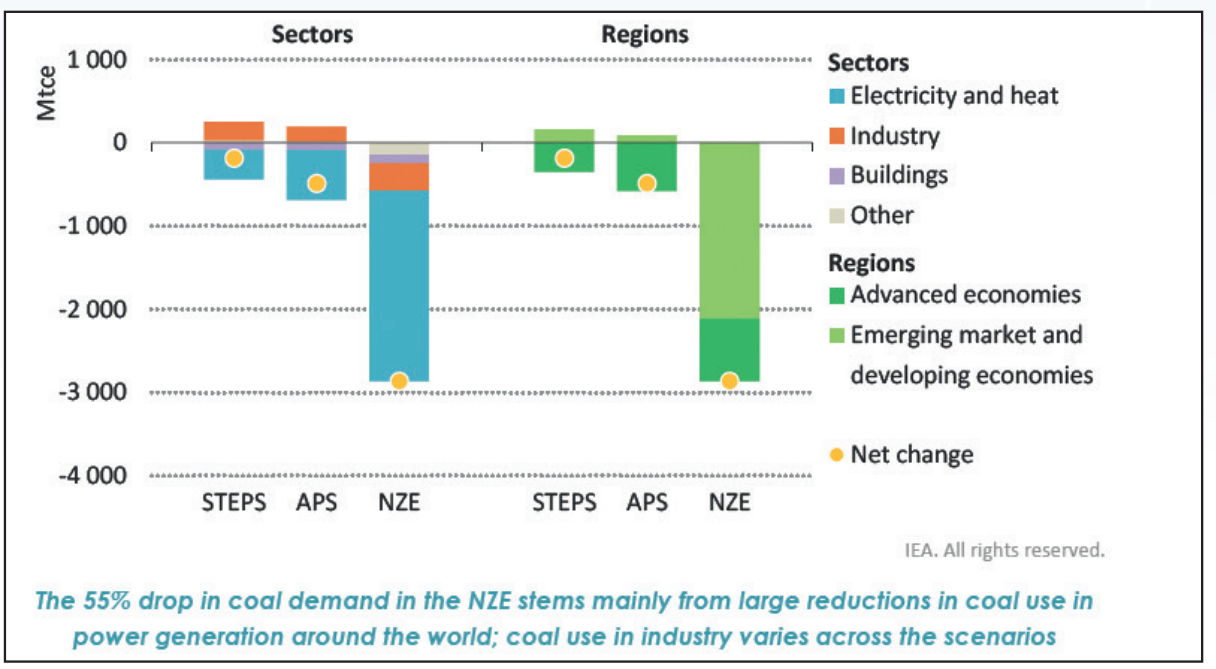
Fuel substitution of oil, coal and natural gas by low-carbon gaseous hydrogen and synthetic methane, 2050



Direct use of hydrogen displaces oil in trucks, as well as coal and gas in power and industry

World Energy Outlook 2020, © IEA/OECD, Figure 5.21, page 237

Change in coal demand by scenario between 2020 and 2030



The 55% drop in coal demand in the NZE stems mainly from large reductions in coal use in power generation around the world; coal use in industry varies across the scenarios

World Energy Outlook 2020, © IEA/OECD, Figure 5.25, page 241

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Hydrogen

Hydrogen plans are on the drawing board but 'deployment is lagging'

The world is ready – even anxious – for an energy transition that is promised to put the global climate back on a pre-crisis course. But it seems to be taking a very long time to get started on all the projects that have been proposed, as a new report from the Hydrogen Council points out.

Gary Lakes

There is a growing pipeline of hydrogen projects being proposed, but most have yet to reach the stage of a final investment decision (FID), according to a new report released by the Hydrogen Council (HC). "Actual deployment is lagging," the HC says in the report, produced in collaboration with McKinsey and Company.

According to the report published in September, 680 large-scale project proposals worth $240 billion have been put forward but only about 10 per cent ($22 billion) have reached a final investment decision (FID).

Europe leads in proposals – about 30 per cent of the total – but China is leading the global effort with the actual deployment of about 200 MW of electrolysers. Japan and Korea are leading in the production of fuel cells with an 11 GW manufacturing capacity.

Urgent and urgently are two words used in the report, which says that investment in mature hydrogen projects is needed greater than ever. "For the world to be on track for net zero emissions by 2050, investments of some $700 billion in hydrogen are needed through 2030 – only 3 per cent of this capital is committed today," the report said, adding: "Ambition and proposals by themselves do not translate into positive impact on climate change; investment and implementation on the ground is needed."

The public and private sectors must move through joint action from project proposals to FIDs, the report states, calling for "policy ambition and project proposals to materialise into actual investments and start delivering environmental and socio-economic benefits, enabling conditions are necessary today," the HC argued.

It states that a key barrier that project developers face is a lack in "demand visibility". Many developers are awaiting decisions on the regulatory frameworks and funding to incentivise offtakers to enter long-term hydrogen supply contracts, which is key to unlocking project finance and support from investors, the report says.

The report identifies several priority actions for policy and industry during the 2022-2023 period. On policy it wants governments to enable demand visibility and regulatory certainty by adopting legally binding measures; it urges fast-tracking access to public funding for hydrogen projects; and it recommends that policies ensure international coordination and [to] support credible common standards and robust tradeable certification systems.

For industry it calls for actions to be taken by advancing project proposals to FID by committing to funding and resource deployment; a scaling up for hydrogen supply chain capability and capacity; and the building of infrastructure for cross-border trade.

As stated in the report, Europe is leading with proposals with some 30 per cent of the total. Last month the European Commission took steps to make €5.2 billion in funding available for the hydrogen value chain through its second Important Project of Common European Interest (IPCEI) program, which is supported by 13 EU members. Austria, Belgium, Denmark, Finland, France, Greece, Italy, Netherlands, Poland, Portugal, Slovakia, Spain and Sweden are participating in IPCEI Hy2Use, as the program is known, and will provide the funding, which is expected to unlock a further €7 billion in private investments.

It is reported by H2 View that 29 companies in the participating states will use the funding to develop 35 projects. The funding is expected to go towards supporting construction of infrastructure and the development of technologies for the integration of hydrogen into industrial processes inside the EU.

IPCEI was established to encourage the supply of renewable and low carbon hydrogen for the sake of cutting Europe's dependence on gas. It compliments the REPowerEU programme, which targets production of 10 million tons of renewable hydrogen by 2030.

Meanwhile, a report entitled 'Renewable Energy and Jobs: Annual Review 2022' prepared by the International Renewable Energy Agency (IRENA) and the International Labour Organization said that during 2021, solar energy showed to be the fastest growing in the renewable jobs sector, adding 4.3 million jobs, equivalent to a third of the current renewable workforce globally.

According to a press release announcing the report, the continuing expansion of renewable energy needs can create many millions of new jobs if it is supported with "holistic policy packages, including training for workers to ensure jobs are decent, high quality, well paid and diverse in pursuit of a just transition".

Announcing the report, Francesco La Camera, IRENA's Director-General, said: "In the face of numerous challenges, renewable energy jobs remain resilient, and have been proven to be a reliable job creation engine. My advice to governments around the world is to pursue industrial policies that encourage the expansion of decent renewables jobs at home. Spurring a domestic value chain will not only create business opportunities and new jobs for people and local communities. It also bolsters supply chain reliability and contributes to more energy security overall."

Gas

Russia pivots from EU to Chinese market for hydrocarbon exports

Western sanctions against Russia's energy industry are apparently beginning to impact Moscow as it increasingly turns to Asia, particularly China, as a viable alternative market for its natural gas and oil exports. Russia's predicament has worked to China's advantage to some degree, but whether it can be a substitute for Europe and other customers is not at all certain.

Gary Lakes

The meeting last month in Uzbekistan during a summit of the Shanghai Cooperation Organization (SCO) between Russian President Vladimir Putin and China's Xi Jinping had to be a disappointing experience for Putin, who was certainly looking for economic as well as moral support from Peking for his war in Ukraine.

Putin and Xi have met numerous times during the last decade and are reported to share a number of opinions, particularly about the West. Unfortunately for Putin, the meeting in Samarkand came at a time when Russian forces were being pushed back by the Ukrainian army.

Prior to the war in Ukraine, Peking said there were "no limits" to the friendship between China and Russia, but since the start of the war last February, China has taken a "balanced" stance and called for negotiations with the intention of doing nothing to arouse the concern in America and the West that China was supporting Russia's war effort. Putin told President Xi that Moscow "understands" China's concerns.

In Samarkand Putin and Xi held a tripartite meeting with Mongolian President Ukhnaagiin Khurelsukh, who engaged in a discussion on future energy infrastructure in Central Asia and a role for Mongolia in the planned Power of Siberia 2 pipeline which was proposed in 2019, following the opening of the first Power of Siberia gas pipeline that carries Russian gas into eastern China.

Besides the Power of Siberia 2 pipeline, Moscow is also proposing that it build an oil pipeline to China via Mongolia. It already delivers 1.6 million b/d to China through the Eastern Siberia-Pacific Ocean (EPSO) pipeline and clearly has more for sale as European and other customers purchase crude elsewhere. Neither the oil or gas pipeline projects can proceed without being underwritten by contracts, but as the European Union takes steps to halt its purchases of Russian oil and gas, the proposals for new export routes from Russia are clearly out there.

Khurelsukh said he supports the idea of Russian oil and gas pipelines passing through Mongolia and suggested they undergo a study. The country would benefit financially through employment and transit fees, plus access to oil and gas supplies. However, it would likely take several years before these pipelines come into use, and where might the Russian energy industry be then?

It's clear that Putin was very mistaken about Europe and its reliance on Russian energy supplies when he launched his invasion against Ukraine. He had on several occasions used natural gas as a weapon against Ukraine, the consequences of which manifested themselves in Europe. And for that reason, the EU had already begun to implement projects that would reduce its members' dependence on Russian gas. But the attack on Ukraine forced the issue for Europe, which continues to take steps to halt Russian imports and prevent Moscow from benefitting financially from oil, gas and coal exports.

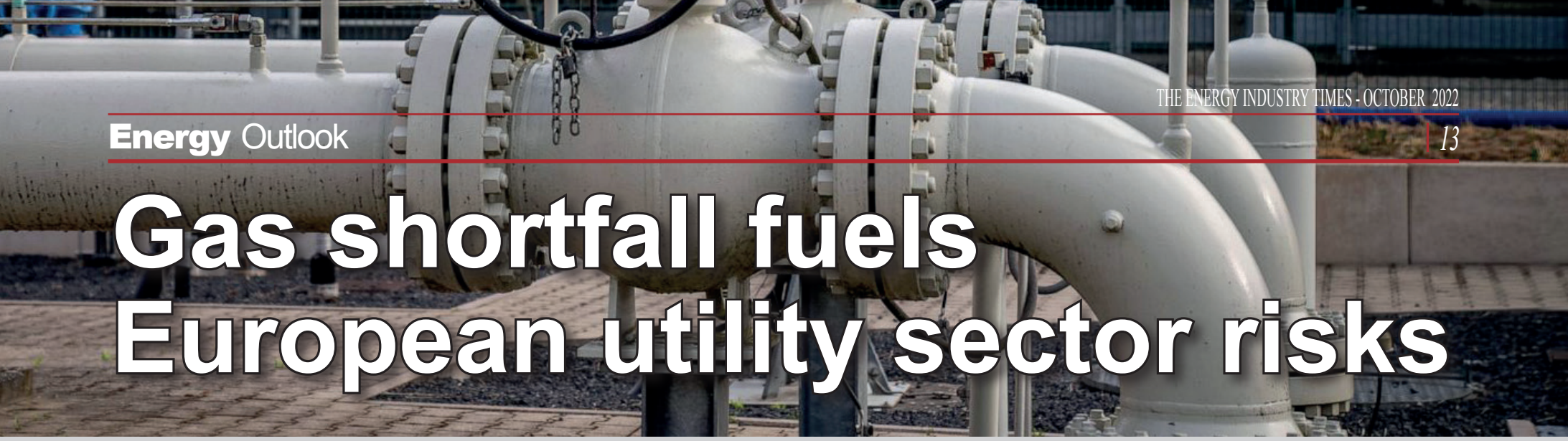
In this regard, Moscow has in the last seven months shifted its market focus to Asia, and China in particular. For China, the Western sanctions against Russian energy has worked in its favour to some degree. It has enabled it to buy oil at discounted prices and to re-export LNG imports from non-Russian suppliers at higher spot prices.

Russia is putting a pretty face on the situation. Last month, Energy Minister Alexander Novak said that Power of Siberia 2 would take the place of Nord Stream 2, Russia's second gas pipeline through the Baltic Sea to Germany. The 55 bcm/year capacity pipeline, a twin to Nord Stream 1, was completed last year, but Germany stopped certification of it once the war in Ukraine began. Russia, has meanwhile, halted its shipments of gas through Nord Stream 1 in retaliation to EU sanctions.

Novak said Power of Siberia 2, which will have a design capacity of 50 bcm/year, will replace Nord Stream 2, and that Russia and China would soon sign a contract for the delivery of that volume. But it will take time for volumes to reach the levels that Russia is talking of delivering to China.

Construction of the Power of Siberia 2 pipeline is tentatively scheduled to begin in 2024, and experts say it is unlikely that China will need more gas than it is already importing until after 2030.

Russia is expected to deliver about 16 bcm of gas via the Power of Siberia 1 pipeline this year and it will be 2025 before the pipeline reaches full capacity of 38 bcm/year.



Gas shortfall fuels European utility sector risks

The ongoing conflict in Ukraine has forced Europe to distance itself from Russian gas supplies. But finding the resources to bridge the resultant gap is fuelling risks for the European energy sector. **Emmanuel Dubois-Pelerin**, Sector Lead, EMEA Utilities at S&P Global Ratings, explains.

Gas plays a crucial role in bridging Europe's diverse power mix, providing reliable backup generation as intermittent renewable capacity ramps up. For decades now, Russia has been Europe's largest supplier. Indeed, the 155 billion cubic metres (bcm) of gas imported from Russia in 2021–140 bcm of which was delivered by Gazprom, Russia's monopoly exporter – represented nearly one-third of total demand.

Yet the ongoing conflict in Ukraine has seen Europe pivot away from Russian gas, with the European Union's ambitious REPowerEU plan seeking to cut all Russian gas imports by 2027. The conflict has led to a considerable shortfall in gas availability for Europe given Russian supply cuts. Indeed, a complete shutoff of Gazprom exports remains a possibility after the susepnsion of Nordstream 1 flows, further jeopardising security of supply. As such, a considerable energy gap has emerged that must be filled ahead of the crucial 2022-23 winter.

In order to meet demand, Europe has turned to various alternative energy sources to bridge this gap. Liquefied natural gas (LNG), for instance, has now become Europe's single largest source of gas supply, and could rise to about 30 per cent of total market supplies should the steep year-on-year increase seen over the January to July 2022 period continue until the end of the year.

In addition, alongside growing concerns regarding security of supply, several countries aim at increasing coal based generation, which may temporarily slow the pace of the energy transition – though we expect this to be temporary. Coal and lignite-based generation, for instance, now represents 30 per cent of the German power mix. The German government is also considering a coal fired capacity reserve of 10 GW, with Austria, France, Italy and the Netherlands considering similar measures.

Another significant change in the power mix is the comeback of nuclear energy. Earlier this year, the European Parliament voted to include nuclear in the EU's green taxonomy, and for some countries, it will form a crucial temporary bridge. Belgium, for example, has extended two GW of existing capacity from 2025 to 2035. Nuclear capacity will be more permanent in other countries, but new builds will require significant government or regulatory support. Since the outbreak of the conflict in Ukraine, such policies have solidified, and France has affirmed plans to build six to 14 European pressurised reactors (EPRs), the UK has decided to build up to eight EPRs, and Poland is proceeding with plans for an additional six reactors.

What do these changes mean for Europe's utilities? To date, credit ratings for the sector have remained largely resistant to challenges. Indeed, while the temporary gas price spike in early March provoked considerable margin calls, utility companies have been able to weather initial shocks and importers have taken actions to somewhat mitigate the impact of future price swings.

In addition, government measures have been largely supportive of credit quality and demonstrate a willingness to support the reliability of energy market functioning until next winter. Indeed, 10 governments have triggered various mitigation plans supportive of both supply and the utility sector. From this autumn, Germany, for instance, will allow utilities to pass on higher supply costs to their customers and the government has also set up a €15 billion facility for Trading Hub Europe GmbH to secure 90 per cent storage by November 1st, despite elevated prices.

Another crucial form of intervention is the establishment of gas rationing plans. In light of a tight supply-demand equation, most European governments have put in place legally binding staged intervention protocols to ration gas by government decision if supplies are insufficient to meet demand in case of a gas shortage, and in June, some started to activate the early stages of these protocols.

Alongside measures protective of utilities creditworthiness, some governments – including France, Italy, Spain and the UK – have also implemented measures supportive of affordability for consumers, with some credit negative implications for utilities. In France, for instance, regulatory measures will contribute to EDF's mid-single-digit EUR billion EBITDA loss in 2022, while its 2022 tariff freeze on household gas represents a negative working capital movement for Engie – though this will be manageable if the freeze is temporary.

What's more, key producers have hedged much of their 2022 production, which should limit the impact of Italy's windfall taxes and Spain's price caps. In the UK, meanwhile, utilities were spared from windfall taxes in June, and despite adverse interventions in recent years, new measures have been geared towards easing the burden on households rather than shifting it onto suppliers.

As such, despite declining global gas demand – triggered by high prices, notably in Europe and APAC, and slower GDP growth – S&P Global Ratings has conducted no upgrade or downgrade exceeding one notch, with most ratings clustered in the BBB to low A range.

Looking ahead, however, international markets face ongoing disruption. Replacing Russian gas comes at a high cost, and energy prices are expected to remain volatile as the sector becomes riskier with reduced visibility. In addition, the ongoing conflict in Ukraine is aggravating pre-existing imbalances in European gas markets, and utilities' credit paths are likely to become increasingly divergent. Where some have enjoyed increased earnings – low-cost generators with high availability, for instance, have been able to capitalise on high power prices – government action on affordability, higher debt costs, interest rates, and inflation could tighten ratings headroom across much of the sector.

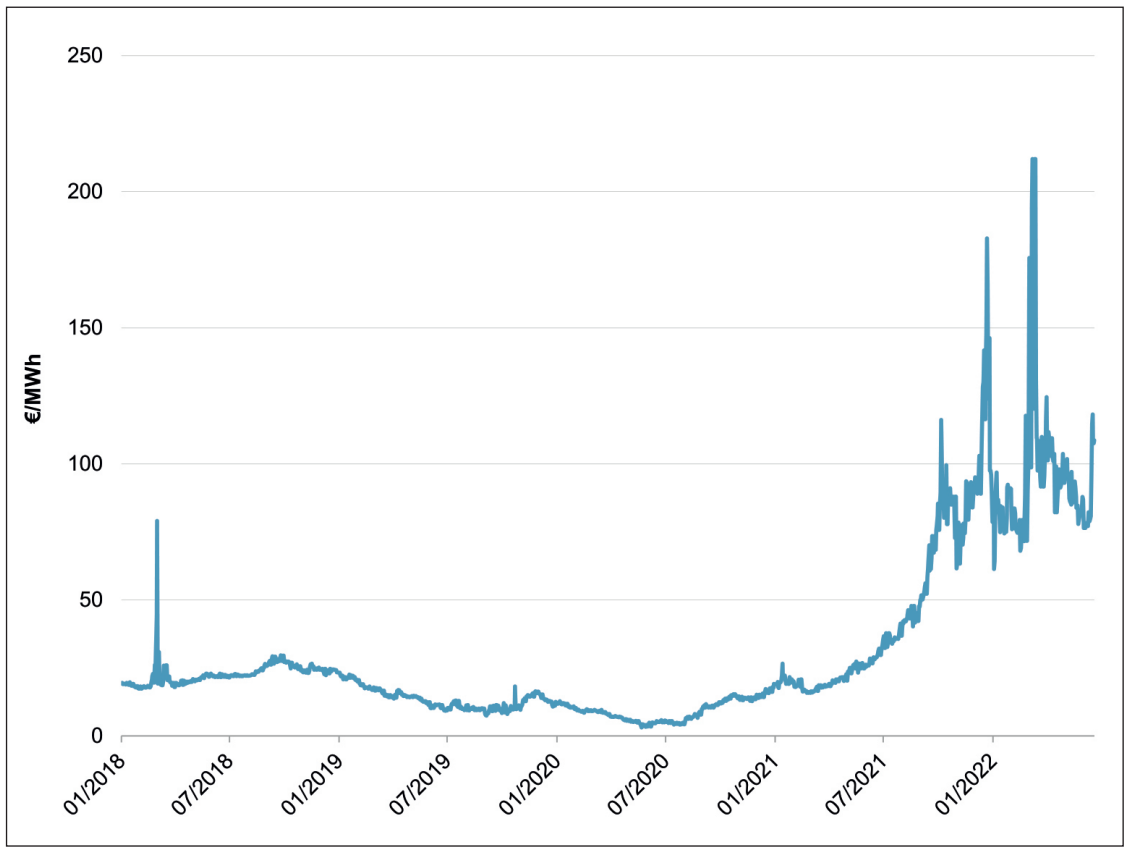
Furthermore, supply difficulties could emerge in the latter part of the 2022-2023 winter which may impact liquidity. A complete shutoff of Gazprom exports is no longer a remote scenario and could lead to supply difficulties in Q1 2023, with November to April typically representing two-thirds of annual requirements. Uniper's earnings and liquidity squeeze has, to date, been unique in its suddenness and extent: as Germany's key importer of Russian gas, its rating was stabilised only thanks to considerable government support. Other gas importers could face similar challenges. Indeed, in the event of a further drop in Gazprom flows, importers could be required to purchase much costlier volumes on the market in order to meet their delivery contracts.

Gas will continue to play an important role in bridging Europe's diverse power mix, presenting a reliable backup to intermittent power supply from renewables. However, the high cost of LNG has challenged appetites for gas in general, and its role is only temporary.

Pressing social-environmental dilemmas – including energy affordability and local acceptance of renewables versus the need to accelerate the energy transition – stand in the way of a consolidation of creditworthiness. Many utilities, for instance, face bottlenecks stemming from local decisions regarding the wider acceptance of renewables generation installations. To address this, national policies may rebalance – favouring security of supply over maximum environmental protections. In addition, public authorities, in collaboration with the industry, will need to establish the acceptable economic cost of security of supply, energy affordability, and indeed a customer pecking order in order to navigate potential supply cuts.

Looking ahead, as the energy industry moves to stabilise itself, it is renewable sources that will present the greatest opportunities – and challenges – for the industry. Indeed, the energy transition offers a route to strengthen utilities' business models and could transform the sector. However, despite the considerable funding available through REPowerEU, in the immediate term, severe industrial bottlenecks will likely persist and some of the EU's ambitious decarbonisation targets may not be met. In the longer term, policy support and the rate at which technology can be developed will determine the pace at which transformation will be achieved.

European day-ahead TTF gas prices stay very high



Climate action progresses despite cloud of gloom and doom

The upcoming COP27 climate change meeting is taking place in a world facing unprecedented challenges. Asia's progress in decarbonising its economies, however, remains a bright spot. **Joseph Jacobelli.**

The next UN global climate talks take place against a backdrop of many macro gloom and doom factors. One bright spot is the climate action progress made by several key economies in Asia, the world's biggest energy consumer. Steps taken by these economies have positive business and investment opportunities implications. There is empirical evidence that shows this.

The last iteration of the Conference of the Parties (COP26) attended by nations that had signed the United Nations Framework Convention on Climate Change (UNFCCC) was in November 2021 in Glasgow, United Kingdom. This annual UN climate change conference produced several positive outcomes. For example, important progress was made on green finance, corporate transparency and disclosure, and the implementation of the Paris Climate Agreement; a legally binding international treaty on climate change where countries state their net zero emissions, or NZE, targets.

The hope was that at COP27, to be held in November 2022 in the Egyptian resort town of Sharm el-Sheikh, climate change action would make even more progress, especially on the execution side. Unfortunately, the world right now faces many macro gloom and doom problems.

A war initiated by Russian President Vladimir Putin, sky-high fossil fuel costs and inflation in many key economies, a rise in interest rates, slowing GDP growth and a looming economic recession, are just some of the factors. Countering these, are extreme natural weather events, which have highlighted a variety of climate risks. The world in 2022 has witnessed unseasonably high temperatures, record-breaking heatwaves, massive droughts, enormous wildfires, and severe flooding. These manifestations of climate change will force the focus to remain on climate action.

Looking at the track record so far, the pace of climate action in key Asian economies has been slow. Their scorecards do not look impressive at all. The Carbon Action Tracker, a not-for-profit think-tank producing independent scientific analysis from two research organisations, tracks the NZE progress of some of the world's most important economies. Looking at a sample of ten important Asian countries, the overall scorecard is that their climate action is largely insufficient. Australia and Japan are rated "Insufficient". Singapore, Thailand, and Vietnam are rated "Critically Insufficient". The climate action of the remaining five are rated "Highly Insufficient"; these comprise China, India, Indonesia, New Zealand, and South Korea.

Yet, with the exception of Thailand all the governments have set NZE targets. The NZE objective for five is 2050, China's and Singapore's are 2060, and India's is 2070. Importantly the momentum is building up. Partly because of extreme weather, as nations in Asia have been far from immune from these events. This is especially true for the most populated regions, China and South Asia which comprise over 3.2 billion people. In China, heat waves produced the highest temperatures in 60 years and drought caused all sorts of havoc, including shortages of power from hydropower plants. The drought and ensuing high rainfall – the highest in Southern China in recorded history – affected rice and other food crops.

Bangladesh, India and Pakistan witnessed shocking heat waves followed by horrendous pre-monsoon rains causing flash floods and general flooding. Another reason for more aggressive climate action is energy security concerns and the high fossil fuels price volatility ensuing from Russia's invasion of Ukraine (see 'Putin's War: the short- and long-term impacts on Asia', *The Energy Industry Times*, April 2022).

Have we seen real evidence of climate action accelerating since COP26 ended? The answer is unequivocally "yes". An example is real climate action from Australia, China, and India.

Since Australia elected a new administration (see 'Elections will accelerate Asia's path to net zero', *The Energy Industry Times*, June 2022) it has finally taken the path to wanting to be a climate action leader as opposed to the laggard it was. The new government led by Prime Minister Anthony Albanese was sworn in at the end of May 2022. It managed to swiftly introduce the Climate Change Bill 2022 which was approved by the country's parliament, 86 to 50, on September 8th. The Bill calls for "greenhouse gas emissions reduction targets of a 43 per cent reduction from 2005 levels by 2030 and net zero by 2050". It also mandates for better transparency by requiring government to provide an annual climate change assessment.

China has done well in reducing its over reliance on coal. In January to August 2022, thermal power (mostly coal fired generation) accounted for 53 per cent of total output compared to 81 per cent for the same period ten years earlier. This could have been even lower if it were not for lower output from its hydro plants.

The key action point since COP26 has been the release of its Renewable Energy 14th Five Year Plan (2021-2025). It was an aggressive yet more measured plan. The more aggressive target is chiefly for non-fossil fuel power generation to reach 20 per cent of the total by 2025 and 33 per cent by 2030; the 2030 target had been only 20 per cent in the 13th Five Year Plan. The more measured approach consists of not focusing on hard renewable energy generation capacity targets, as the focus is on the gigawatt-hours (GWh) and not the gigawatts (GW); this together with a mountain of measures to improve clean energy adoption. Emissions are now more likely to peak by 2025 or so versus the planned 2030, according to one observer.

India had 152 GW in non-fossil fuel generation capacity at the end of 2020. Since COP26, it has announced that it targets the amount to reach 500 GW by 2030. Another action point was finally submitting its Nationally Determined Contribution or NDC to the UNFCCC in August. An important step given that India is the third largest polluter in the world and is one of the last major emitters to meet its Paris Agreement obligation. Like China, it also introduced a bunch of climate action measures it will push to promote through tax and financial benefits investments in electric mobility, including electric vehicles and battery manufacturing. Also, the cabinet announced an incentive scheme directed to the production of high efficiency solar PV modules domestically. It is hoped that the country will change its NZE 2070 target to 2050 like many other nations.

All of these steps undertaken by various key Asian countries have positive implications in terms of business and investment opportunities.

Business-wise there are a variety of incentives for clean energy businesses. The business opportunity is massive, including the domestic manufacturing of renewable energy equipment such as solar PV modules and energy storage – batteries or other. The opportunity is also great for investors such as private equity funds or energy corporations.

Let's take Southeast Asia as an example. The total population is about 690 million, according to the latest United Nations estimate. Primary energy demand almost doubled between 2000 and 2020, calculated the International Energy Agency (IEA). Renewables rose 143 per cent to account for 18 per cent of the total but at the same time coal jumped over 470 per cent to account for 26 per cent of the total. In terms of investments, as the IEA points out, spending on energy will be very high because consumption is expanding, and the share of clean energy is rising. Numbers-wise, in the five years through 2020, the annual average energy sector investment was about $70 billion, including 40 per cent related to clean energy. For the ten years through 2030, it will be $130-190 billion annually, with clean energy taking in an even bigger share.

Giuseppe 'Joseph' Jacobelli is Managing Partner at Asia Clean Energy Investments a single-family office and direct investments advisor. He is an Asian energy markets expert, author of 'Asia's Energy Revolution' (De Gruyter, 2021) and host of The Asia Climate Capital Podcast.

Key Asian Economies Climate Action Scorecard

Note: Insuf. = Insufficient; Update = latest update undertaken by Climate Action Tracker. Chart compiled by the author using data from Climate Action Tracker, 'Home | Climate Action Tracker' (Climateactiontracker.org, September 2022) <https://climateactiontracker.org/> accessed 20 September 2022

	Overall Rating	Policies & Actions	Domestic/Internationally Supported Target		Fair Share Target	Climate Finance	Net Zero Target		Update
Australia	Insuf.	Insuf.	Almost Sufficient		Insuf.	Critically Insuf.	Poor	2050	02-Aug-22
China	Highly Insuf.	Insuf.	Insuf.		Highly Insuf.		Poor	2060	19-May-22
India	Highly Insuf.	Almost Sufficient		Critically Insuf.	Highly Insuf.	Insuf.		2070	15-Sep-21
Indonesia	Highly Insuf.	Insuf.	Insuf.	Critically Insuf.	Critically Insuf.	Insuf.		2060	01-Nov-21
Japan	Insuf.	Insuf.	Almost Sufficient		Insuf.	Critically Insuf.	Poor	2050	10-Feb-22
New Zealand	Highly Insuf.	Highly Insuf.	Insuf.		Critically Insuf.	Highly Insuf.	Poor	2050	15-Sep-21
Singapore	Critically Insuf.	Highly Insuf.	Critically Insuf.		Critically Insuf.			2060	15-Sep-21
South Korea	Highly Insuf.	Highly Insuf.	Insuf.				Average	2050	08-Mar-22
Thailand	Critically Insuf.	Critically Insuf.		Critically Insuf.				Nil	15-Sep-21
Vietnam	Critically Insuf.	Critically Insuf.		Critically Insuf.	Critically Insuf.			2050	29-Oct-21

Floating new ideas

The cost of floating offshore wind is largely governed by the capex of the floating sub-structures.
Junior Isles speaks to Gazelle Wind Power's Jon Salazar about a new hybrid platform it has developed that will significantly reduce cost of installations and accelerate the deployment of floating offshore wind generation.

According to the Global Wind Energy Council (GWEC), more than 315 GW of new offshore wind capacity will be added over the next decade (2022-2031), bringing total global offshore wind capacity to 370 GW by the end of 2031.

As the market matures, wind turbines will be increasingly installed in deeper waters further offshore resulting in a massive growth in floating offshore wind installations. GWEC predicts this fledgling market will grow from just over 121 MW at the end of 2021 to 18.9 GW by 2030, with the vast majority coming online after 2027.

With the share of floating wind forecasted to grow significantly and governments implementing clean energy policies, investments are flowing into technology advances in the area that will lower costs and increase turbine capacities – as they have done and continue to do for fixed bottom installations.

Gazelle Wind Power is one company looking to unlock the massive deep-water offshore wind market through technology that it says significantly reduces the cost of floating wind turbines and increases speed to market.

Commenting on the market, Gazelle Wind Power's CEO, Jon Salazar, said: "If we want to keep to the targets for global warming, we need these forecasts for offshore wind to be accomplished."

Being at the start of its maturity curve, for floating offshore wind to hit these predictions calls for a huge ramp-up and some significant challenges to be overcome.

"We can see three main challenges," said Salazar. "One is at the technology level; another is the supply chain – how to move from pilots to mass-produced solutions; and lastly, the certainty that's needed to drive investment."

He added: "The primary issue for floating wind, today, is primarily capex [capital expenditure] price. This is impacting the LCOE [levelised cost of energy]."

According to Salazar, the capex forecast in 2025 is €3870/kW giving an LCOE of €90/MWh. This compares to 2031/kW for fixed bottom and an LCOE of €50/MWh. By 2030, he says, the LCOE for floating wind is predicted to fall to 50 MWh, compared to 43/MWh for fixed bottom installations.

To achieve this, he says the industry needs to reduce the capex of current designs as well as increase the availability of wind turbines for the technology – especially for floating substructures that require wind turbine generator re-design.

"The large wind turbine manufacturers are not that eager to re-design their wind turbines," noted Salazar. "If you need a slightly different reconfiguration, it's not there. And finally, the market needs solutions that are easy to assemble and easy to manufacture." This, he says, is necessary to deliver installations at the rate that is necessary to meet forecasts.

Gazelle Wind Power aims to address these issues through what it calls a hybrid floating platform. According to the company, the new platform significantly reduces the cost of the floating substructure, which accounts for the main capex of the installation, and increases speed to market. According to the company, the new platform design dramatically reduces capex, which translates into a lower LCOE.

Explaining the design, Salazar said: "A floating wind installation requires a floating foundation since we are going into sea waters that are 60 m deep or more. Most floating substructures are adaptations from oil and gas. They are either variations of semi-submersibles, tension-leg platforms or spars. All of these have one thing in common: they require a significant amount of steel or concrete in order to provide the buoyancy and stability. If the wind turbine sways too much, say more than 10 degrees, the turbine operation will cease."

Gazelle Wind Power says its solution is lighter than conventional platforms – it uses significantly less steel and is substantially lower in weight than other floating platforms. It has a tilt of less than 5 degrees, and has 50 per cent less mooring tension load than tension leg platforms.

"On tension leg platforms, the mooring loads are very high because of the type of mooring connected to the seabed," said Salazar. "In our case, we can move up and down because we have a dynamic mooring system. As far we know, this is the first dynamic mooring system in the world to be patented for floating offshore wind. This allows us to use vertical moorings, although at the same time not being limited vertically."

He added: "What we are doing is radically different. Our technology doesn't come from oil and gas; it has been specifically designed to solve the floating offshore problem. This is why we have had such commercial technical traction and secured record funding in such a short time.

"We are taking a wind turbine that can be almost the height of the Eiffel Tower, of the latest 14-15 MW design, and have separated the floatability from the stability, allowing us to achieve a lightweight design. The hull of our platform is like a boat; it follows shipbuilding techniques. The mooring system is quite novel; it also provides the stability."

The unique platform design responds to waves through the action of a central counterbalance connected via the platform to anchors on the seabed. The geometric design makes the platform move horizontally and vertically with wind and waves, with almost zero pitch angle. Although most offshore wind turbines are designed to support pitch angles of up to 10 degrees, this creates additional wear and tear on components. Near null pitch means less wear, less maintenance, and longer life of the wind turbine generator (WTG), which translates into more energy production and greater return on investment. While installations are designed to have a 25-year lifespan, Salazar believes the platform's stable design might, in the future, serve to extend the life of the wind turbine.

Notably, the design has received a Statement of Feasibility from DNV, which demonstrates the technical feasibility and commercial readiness of the technology.

The other important aspect of the design is its modularity. The Gazelle platform is made up of modular and scalable parts, making manufacture and assembly cost-effective and efficient. Components are smaller and lighter, reducing the need for space in harbours and shipyards, while minimising the use of cranes. The use of smaller, lighter parts means more cost-effective transport to site and easier installation using standard port facilities and vessels.

Gazelle has already formed strategic alliances with a number of large companies to help set up of a large-scale demonstration project and scale-up the technology for larger installations. For example, Maersk Supply Services will provide the engineering, procurement, construction and installation (EPCI) to support the development of a pilot project. Bridon-Bekaert Ropes Group will supply its advanced mooring lines for the pilot project, while Vienna Consulting Engineers ZT GmbH will provide monitoring and analysis.

Most recently, Gazelle signed an MoU with Ferrofab FZE (Ferrofab), a UAE-based engineering and manufacturing firm, to establish a Centre for Manufacturing Excellence at the Ferrofab Jebel Ali facility in the UAE. This centre is being established to manufacture the platform.

"This is super important because the early engagement of fabricators, is key in order to produce a solution that is mass-producible," noted Salazar.

The pilot project is expected to be operational by 2024/2025 and will run for about two years. Data from its operation will be fed back into the design of the commercial product, which could be tested around 2026/27.

"We are already developing a 15 MW commercial product so it's important for us to work with the major OEMs to ensure the commercial product we develop can be coupled with the latest wind turbines," said Salazar. "Today the market is looking at 14-15 MW turbines, and we expect it may go up to 19 or even 20 MW. The wind turbine manufacturers will not be that eager to make specific machines for specific platforms, so it's super important that we couple with the technologies they are developing. Being able to couple with these standard wind turbines will be a differentiator between developers of floating substructures."

Having confirmed the physical principles and demonstrated the performance and commercial feasibility of the platform through a number of tests under various site conditions, Salazar says the focus is on industrialisation.

"It's now about mass production; how we can make a platform very easy to manufacture and assemble," he said.

The coming months will see the company set up a "world class team" in the UK with a view to capitalising on the huge opportunity in the North Sea.

Salazar concluded: "The North Sea is one of the initial markets. The first targets will be markets like the UK, Portugal, Norway, Spain, France and Germany. In the second phase we will see countries in Southeast Asia, including Japan, South Korea and Taiwan, with Latin America and the US emerging around 2030. But the potential for floating offshore wind is global and it's massive. Over the next decades, we will see hundreds of billions of dollars invested."

Salazar: As far we know, this is the first dynamic mooring system in the world to be patented for floating offshore wind

Junior Isles

All change

All things come to an end. Many never contemplated life without the Queen; yet almost suddenly (despite being 96), she was gone. Prior to Russia's war on Ukraine and today's eye-watering electricity prices, no doubt few could have envisioned a radically different EU electricity market. Yet after decades of the *status quo*, here we are – on the verge of inevitable change.

As part of a series of measures to address the deepening energy crisis, European Commission President Ursula von der Leyen said in her annual State of the European Union address last month that the market was no longer functioning and needed "comprehensive reform" to break the influence of gas on electricity prices.

The Commissioner stressed that the design of energy markets was not "fit for purpose" and needed to be redesigned. She admitted that the bloc's electricity pricing system, which does not allow users to benefit from the lower costs of renewables or nuclear power, "was developed for different circumstances".

Typically, electricity prices reflect gas prices. This is because the types of energy needed to produce electricity are ranked, with renewables and nuclear prioritised ahead of coal and gas. The price of electricity is set every half hour by the margin cost of the last generating unit to be switched off to meet demand, typically gas. This pushes up electricity prices when wholesale gas prices rise.

The current system, which had been long praised for boosting transparency and promoting the transition to green energy, is now, however, drawing widespread criticism.

In recent months, power prices have reached record-high levels, averaging over €500/MWh in August. In the case of France, at the end of August, the price per megawatt hour exceeded the record threshold of €1000 for the first time in history, more than ten times the prices of a year earlier.

In light of the extraordinary turbulence in gas and power markets, EU energy ministers held an emergency meeting on September 9 to discuss policy options for swiftly addressing Europe's energy crisis. Although no longer part of the EU, similar discussions were held in the UK.

Several reforms are currently up for discussion in the EU and the UK, including greater regulation of prices and demand, and actions to address the severe liquidity concerns of some of its power and gas exchanges and market participants, even solvent ones. In a statement, S&P Global Ratings said it believes the measures could reduce overall systemic risks and credit risk for individual utilities.

"We believe that the degree to which the EU's and UK's selected policy actions could help stabilise and increase the predictability of Europe's power and gas markets, as well as utilities' liquidity and overall credit quality, will depend on how quickly measures can be implemented and how they work together," it said.

A little more than a week before the passing of Queen Elizabeth II, the UK's then Business Energy and Industry Secretary, Kwasi Kwarteng (now Chancellor), met members of Energy UK to discuss a proposal aimed at separating the cost of electricity from sources such as nuclear, solar and wind from the sky-high prices being paid for electricity generated from gas.

Energy UK, the trade body for the sector, said its proposals could cut £18 billion a year from energy bills, including £11 billion for businesses. This could deliver a saving for households of between £150 and £250 a year.

Under the proposals – first suggested by the UK Energy Research Centre – nuclear power stations and renewable electricity generators would be encouraged to sign up to a new type of contract. These contracts for difference (CfDs) would mean selling their electricity at a lower price, but one that was fixed and guaranteed over a number of years.

Many older nuclear, solar and wind generators are on renewable obligation (RO) contracts, under which they sell at the current wholesale rate. Under the RO model, designed for wind and solar, power generators receive the value of their electricity on the wholesale market, as well as an additional subsidy. The market structure has led to those on RO contracts benefitting from higher prices, potentially making windfall profits. Energy UK is urging ministers to make it possible for RO contracts to be exchanged for CfDs.

Adam Berman, Energy UK's Deputy Director, said: "The current energy market doesn't allow customers to fully benefit from the cheapest form of electricity – domestically produced low-carbon generation.

"This scheme would be a significant first step to decoupling gas from retail electricity prices. Removing the link between gas and retail electricity prices will be complex and take time, but this solution provides a quick fix for up to 40 per cent of our generation capacity."

Research published by UK university, UCL, confirms that natural gas is the main driver of electricity prices across Europe; in the UK, in recent years it set electricity costs 84 per cent of the time, despite providing well under half of the total electricity.

Professor Michael Grubb (UCL Institute for Sustainable Resources), said: "Fossil fuels used to be cheaper than renewable energy sources, but that has turned on its head as gas prices shot up and the cost to produce renewables such as wind and solar power has plummeted. Half of our electricity already comes from non-fossil fuels, and that figure is growing.

"If we actually paid the average price of what our electricity now costs to produce, our bills would be substantially cheaper."

The EU, meanwhile, said companies producing electricity from renewables are currently making "enormous revenues, revenues they never calculated with, revenues they never dreamt of and revenues they cannot reinvest".

The Commission has now proposed, among other things, the introduction of a €180/MWh price cap for so-called "infra-marginal producers of electricity". These include wind, solar, geothermal, hydro, nuclear and lignite. The difference between the wholesale electricity price and the €180/MWh cap would be recovered by national governments to finance energy efficiency measures, help vulnerable households pay their bills and support companies hit by the energy crisis.

The 'revenue cap' for non-gas power generators together with a separate levy or "solidarity contribution" on oil and gas majors is expected to generate €140 billion from energy companies, which the Commission believes are benefitting from the crisis, and "cushion" consumers from high prices.

The price cap is EU-wide and technology-neutral, meaning that it equally applies to all member states and to all infra-marginal producers. It applies to revenue generated from all contractual market arrangements, including electricity sold on the wholesale market, under a Power Purchase agreement (PPA) as well as forward hedges. The Commission clarified that the revenues of wind energy PPAs and forward hedges would typically be below the €180/MWh cap.

However, the European Commission proposal would allow member states to go further in limiting revenues of infra-marginal producers. States would also be allowed to maintain already introduced price caps. Wind Europe said this was "not helpful".

Europe needs more renewables as soon as possible to reduce its over-reliance on Russian fossil fuel imports and to overcome the current energy crisis. A patchwork of different price caps, unilaterally introduced by individual member states, creates investment uncertainty, said Wind Europe.

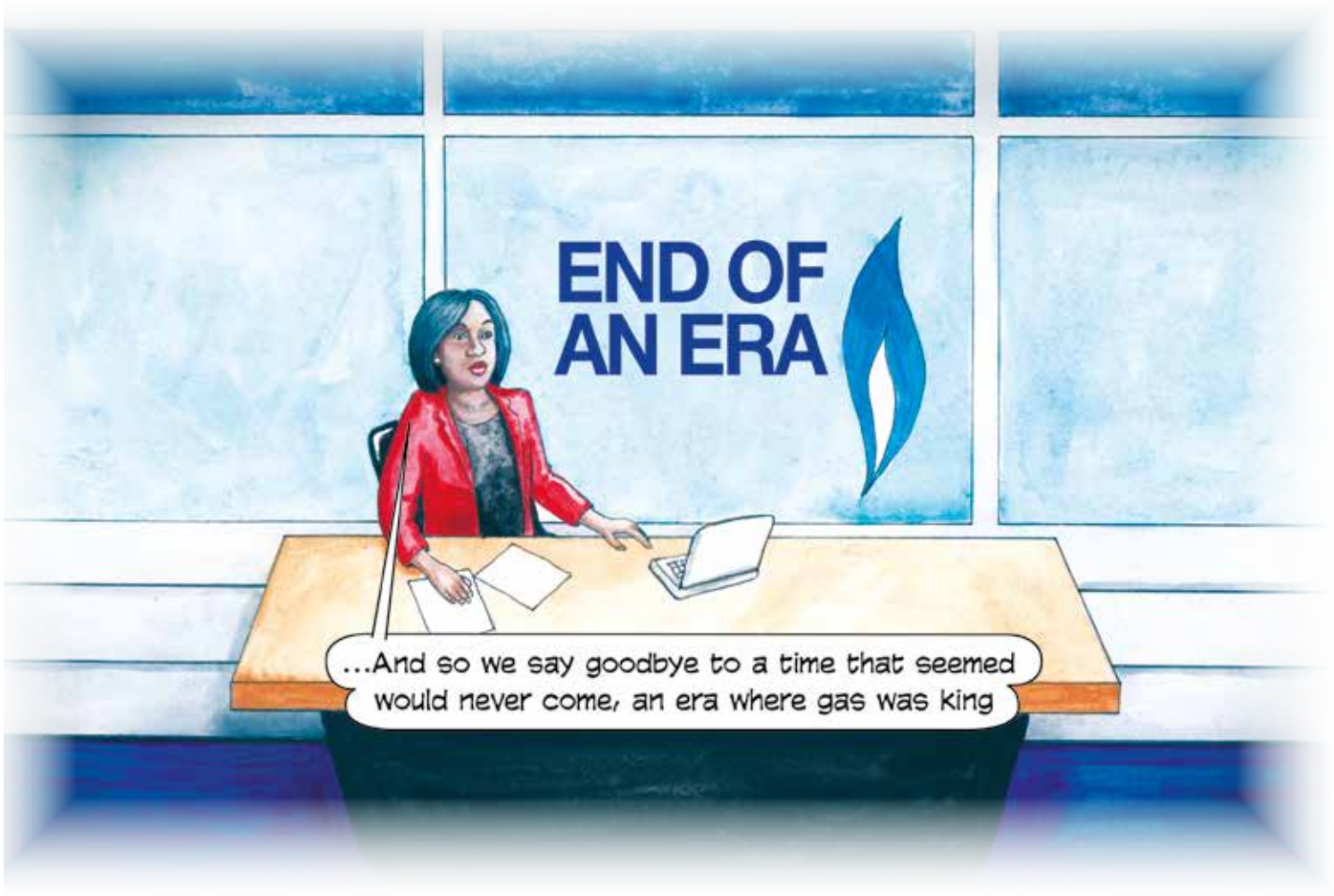
"The EU wants a huge expansion of renewables to help get out of the current energy crisis. That means loads of new investments in wind and solar. But investors need visibility. So an EU-wide cap on revenues from wind should be precisely that – a single EU-wide cap," said WindEurope CEO Giles Dickson.

It is expected that European energy markets are likely to see major policy changes by first-quarter 2023. Certainly, it cannot come soon enough.

In order to drive electricity prices back down quickly, one Belgian energy ministry spokesman said, "we have to consider measures which were unthinkable before".

The EU's electricity market design has reigned for 25 years and worked well in an era when gas was king. With the pressure of climate change, and energy now used as a weapon, the time has come for a new king and consequently a new market.

Although some would argue that a monarchy in this day and age is an out-dated concept, there is no doubt the current energy market design is well past its sell-bydate. The Queen's reign came to a natural end after 70 years; it's a shame it has taken a crisis to end the energy market *status quo*.



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