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Heat pumps are hot

Demand for heat pumps is growing but high gas prices and worsening climate change calls for even greater urgency in their deployment. *Page 13*



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The Stratus project is a "world-first" smart transformer trial that is set to provide unparalleled network insights to help maintain reliable power supplies as the UK transitions to a low carbon future. *Page 15*

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Clean energy ramp-up slows emissions but IPCC says 'time-bomb' still ticking

Carbon emissions rose less than expected last year according to the International Energy Agency, but the recent report by the UN Intergovernmental Panel on Climate Change still warns of the growing climate crisis. **Junior Isles** reports.

Global energy-related carbon dioxide emissions rose by less than 1 per cent in 2022, less than initially feared, but the world is still on course for catastrophic climate change.

According to a recent report by the International Energy Agency (IEA), global energy-related CO₂ emissions grew in 2022 by 0.9 per cent, or 321 million tonnes, reaching a new high of more than 36.8 billion tonnes.

"The impacts of the energy crisis didn't result in the major increase in global emissions that was initially feared – and this is thanks to the outstanding growth of renewables, EVs, heat pumps and energy efficient technologies. Without clean energy, the growth in CO₂ emissions would have been nearly three times as high," said

IEA Executive Director Fatih Birol.

Renewable energy sources met 90 per cent of last year's growth in electricity generation, the IEA said, as wind and solar power set new records. Although power sector emissions increased by 3.4 per cent, coal use was not as high as anticipated. For the first time, electricity generation from wind and solar PV combined exceeded that of gas or nuclear, the report noted.

CO₂ emissions from coal grew by 1.6 per cent as the global energy crisis continued to spur a wave of gas-to-coal switching in Asia, and to a lesser degree in Europe. While the increase in coal emissions was only around one-quarter of 2021's rise, it still far exceeded the last decade's average growth rate. The increase in emissions

from coal more than offset the 1.6 per cent decline in emissions from natural gas as supply continued to tighten following Russia's invasion of Ukraine and as European businesses and citizens responded with efforts to cut their gas use.

The IEA warned however, that the continued rise in carbon emissions was "hindering efforts" to meet the world's climate targets. "International and national fossil fuel companies are making record revenues and need to take their share of responsibility, in line with their public pledges to meet climate goals. It's critical that they review their strategies to make sure they're aligned with meaningful emissions reductions," said Birol.

Although the rise in emissions last

year was far smaller than the exceptional jump of over 6 per cent in 2021, emissions still remain on an unsustainable growth trajectory, said the IEA.

This was reiterated in a stark warning set out in the latest UN Intergovernmental Panel on Climate Change (IPCC) report.

In its Synthesis Report of the Sixth Assessment Report (AR6), the IPCC said global warming is "more likely than not" in the near-term to reach a 1.5°C rise since pre-industrial times.

The report – which integrates the findings of the three Working Group assessments as well as the three Special Reports on 'Global Warming of 1.5°C', on 'Climate Change and Land,

Continued on Page 2

F-gas regulation proposals raise concern

The European Parliament has been urged to "pause for thought" before pressing ahead, following its Environment Committee's vote to ban fluorinated (F) gases.

At the start of March, the Committee voted to ban all fluorinated gases in most products as part of the effort to mitigate global warming – a move the European Partnership for Energy and the Environment (EPEE) says is "unrealistic and self-defeating". The move would represent a ban on equipment containing F-gases, in some cases as early as 2026.

Many of the F-gases used as refrigerants in equipment such as heat pumps and as the insulating medium in gas-insulated switchgear (GIS) have a global warming potential (GWP) that is thousands of times higher than carbon dioxide.

The EPEE says these F-gases, along with non-fluorinated natural refrigerants, are essential for the 60 million

heat pumps that the EU aims to make available by 2030 to support energy independence and to secure the cold value chain for food and health safety. Its alliance of associations and global partners therefore urged the Committee to reconsider a compromise on certain amendments to the F-gas regulation.

Russell Patten, Director General of EPEE, said: "We fully support the phase-down of HFCs and the use of natural refrigerants like propane in heat pumps where feasible. But the fact is propane heat pumps cannot be installed in every building for private and commercial use, so customers would have no other choice than to go for fossil fuel technology or direct electric heaters. This would undermine Europe's carbon neutrality goals, slow down the process of building decarbonisation and jeopardise the goals of REpowerEU and the EU Green Deal Industrial Plan.

"We also note that the amendments proposed will shorten the lifetime of currently installed equipment, limiting possibilities for maintenance and repair, while businesses and consumers are already under economic pressure," Patten added.

Thomas Nowak, Secretary General of the European Heat Pump Association, commented: "MEPs should not slam down both the accelerator and the brake pedals at once.

"The EU needs to decarbonise and get off fossil fuels in heating with top priority. It has recognised heat pumps as the solution – so, the road ahead needs to be cleared of obstacles, not blocked off."

He added: "The industry is committed to the safe handling of refrigerants and the transition to refrigerants with a low global warming potential, with the aim of reaching zero emission through heat pump technology by 2050."

In terms of the GIS market, F-gases are prohibited in high-voltage switchgear for voltage levels ≤ 145 kV from 2028, and from 2031 for voltage levels > 145 kV. A derogation has been added for high-voltage switchgear that if no F-gas-free alternative is available or if only one bid for F-gas-free switchgear was placed, a gas with a GWP of up to 1000 can be used.

Tim Holt, member of the Managing Board of Siemens Energy, commented: "The expansion targets for European power grids are enormous, so we need to set the right course now. The technologies we use today will remain in the grid for decades. That's why the rapid phase-out of F-gases in switching technologies must prevail if we really want to do something for the environment."

The European Parliament's final vote was expected during the 29-30 March plenary session, as *TEI Times* went to press.

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and on the ‘Ocean and the Cryosphere in a Changing Climate’ – found the risks of warming were greater than was thought at the time of the last assessment in 2014. Some regions had already reached the limits of what they could adapt to.

The report underscores that urgent measures are needed now to avoid climate breakdown, because the current pace and scale of action is far from sufficient.



Guterres called the IPCC report a “survival guide for humanity”

Launching the report in Interlaken, Switzerland, UN Secretary General António Guterres, said “the climate time-bomb is ticking,” but the IPCC report is a “survival guide for humanity”.

He said: “[The report] shows, the 1.5°C limit is achievable. But it will take a quantum leap in climate action. This report is a clarion call to massively fast-track climate efforts by every country and every sector and on every timeframe.”

Guterres proposed “a Climate Solidarity Pact” to the G20, in which all big emitters make extra efforts to cut emissions, and wealthier countries mobilise financial and technical resources to support emerging economies in “a common effort to keep 1.5 degrees alive”.

He said “it starts with parties immediately hitting the fast-forward button” on their net zero deadlines to get to global net zero by 2050 – in line with the principle of common but differentiated responsibilities and respective capabilities, in light of different national circumstances.

“Specifically, leaders of developed countries must commit to reaching net zero as close as possible to 2040, the limit they should all aim to respect,” said Guterres.

According to the Energy Transition Commission (ETC), investments in clean energy must quadruple within the next two decades to meet net zero targets. In a report following the IPCC warning, the ETC said around \$3.5 trillion a year of capital investment will be needed on average between now and 2050 to build a net zero global economy, up from \$1 trillion per annum today. Of this, 70 per cent is required for low-carbon power generation, transmission, and distribution, which underpins decarbonisation in almost all sectors of the economy.

The ETC’s ‘Financing the Transition: How to make the money flow for a net-zero economy’ highlights the critical importance of strong government policies relating both to the real economy and to the financial system if finance is to flow on the scale required. It also identifies ‘concessional/grant’ payments needed to support early coal phase-out, end deforestation and finance carbon removals.

EU electricity market reform triggers mixed reaction

The European Commission has presented its eagerly awaited plan for reforming the electricity market. Although it has chosen to avoid the major overhaul some were hoping for, its proposals have received a mixed reaction.

Junior Isles

The EU’s recent proposal to reform its electricity sector has triggered mixed reactions from the bloc’s 27 member countries.

Last month, the European Commission presented a raft of proposals aimed at reducing price volatility while promoting energy security by incentivising non-fossil fuel power generation.

Since the summer of 2021, energy prices have seen unprecedented spikes and volatility, and have had a severe impact on EU households and the economy, especially following Russia’s invasion of Ukraine that sparked an energy crisis in Europe. Many consumers saw bills increase due to the gas price surge, even though renewable energy sources are already covering more than a third of EU electricity demand.

The proposed reform, however, avoids the deep structural change that countries like Spain and Portugal had called for, with some arguing it does not stop gas prices affecting the electricity market, as happened last year. “Right now [the proposal] doesn’t seem to address the problems,” said one senior EU diplomat.

Instead the Commission has looked to revise existing mechanisms. The proposed reform foresees revisions to several pieces of EU legislation – notably the Electricity Regulation, the Electricity Directive, and the REMIT Regulation. It introduces measures that incentivise longer term contracts with non-fossil power production and bring

more clean flexible solutions into the system to compete with gas, such as demand response and storage. This, it says, will decrease the impact of fossil fuels on the consumer electricity bills, as well as ensure that the lower cost of renewables gets reflected in there. In addition, the proposed reform will boost open and fair competition in the European wholesale energy markets by enhancing market transparency and integrity.

A key aim of the Commission is to enhance predictability and stability of energy costs to boost industrial competitiveness.

Over the past year, many companies have been severely affected by excessively volatile energy prices. To enhance the competitiveness of EU industry and to reduce its exposure to volatile prices, the Commission is proposing to facilitate the deployment of more stable long-term contracts such as Power Purchase Agreements (PPAs) – through which companies establish their own direct supplies of energy and thereby can profit from more stable prices of renewable and non-fossil power production. To address the current barriers such as the credit risks of buyers, the reform obliges Member States to ensure the availability of market-based guarantees for PPAs.

In order to provide power producers with revenue stability and to shield industry from price volatility, all public support for new investments in infra-marginal and must-run renewable and non-fossil electricity generation will

have to be in the form of two-way Contracts for Difference (CfDs), while Member States are obliged to channel excess revenues to consumers. In addition, the reform will boost liquidity of the markets for long term contracts that lock-in future prices, so-called ‘forward contracts’. This will allow more suppliers and consumers to protect themselves against excessively volatile prices over longer periods of time.

This approach does not align with that favoured by Germany, which is progressing with plans for an “industrial price for electricity”. Berlin argues that businesses should be able to benefit from the low cost of renewable energy through “power purchase agreements” with wind and solar developers.

“Production costs are at about 5-9 cents per kilowatt hour, and that’s where the corridor lies,” Robert Habeck, Germany’s Economy Minister told reporters. He said the government was examining the Commission’s proposal “in detail” and that it supported efforts to increase hedging in the power market to ensure that the “advantages of renewable energies... reach the consumer even better”.

EU Commissioner for Energy Kadri Simson urged Berlin to back the use of long-term contracts and warned that its plan to place a cap on electricity costs for industrial users would harm Europe’s single market. Simson said the idea of lower tariffs for industry would have to be considered by the Commission’s state aid officials.

The Commission is hoping that its

reform will also incentivise new investments in power generation capacity from renewable sources to remove gas and coal from the electricity mix.

Building a renewables-based energy system will not only be crucial to lower consumer bills, but also to ensure a sustainable and independent energy supply to the EU, in line with the European Green Deal and the REPowerEU Plan. This reform, which is part of the Green Deal Industrial Plan, will also allow the European industry to have access to a renewable, non-fossil and affordable power supply which is a key enabler of decarbonisation and the green transition.

“Renewables are our ticket to energy sovereignty and ending our dependence on fossil fuels,” EU Commission Vice-President Frans Timmermans said.

WindEurope welcomed the Commission’s approach. CEO Giles Dickson said: “The problem of Europe’s electricity market these last two years has not been the market design. It’s been high gas prices, made worse by the war.”

“The market design has been extremely efficient in matching supply and demand – and has given consumers years of affordable electricity prices. It’s good the Commission proposal builds on the strengths of the existing market design. What’s needed is an evolution not radical changes.”

The proposed reform will now have to be discussed and agreed by the European Parliament and the Council before entering into force.

US-Europe seek to ease subsidies tension

US Energy Secretary Jennifer Granholm sought to ease clean energy trade tensions with the EU, through recent talks about a free trade-style deal around clean technology.

Last month, she told the *Financial Times* that the Biden Administration was in talks with the EU about easing Europe’s anxieties that the US’s \$369 billion in new subsidies for low-carbon energy would lure investment away from Europe to the US.

“We don’t want to see any trade

rivalry. And we’re in discussion with our EU counterparts about how to make sure we can do this in a way that lifts all,” she said.

Granholm said the US was seeking to build a “backbone” of manufacturing to reverse decades of deindustrialisation and break dependence on China. But said allies would not be excluded.

Her comments followed a move by the EU to relax state aid rules, where EU member states are now allowed to

“match” multi-billion dollar incentives. The overhaul published by the European Commission last month will for the first time justify large-scale public funding for green projects if similar incentives are offered outside Europe, a radical departure in how state subsidies have been policed within the bloc.

The measures will allow states to pump billions of euros into the production of solar panels, batteries, wind turbines, electrolysers and heat pumps.

The EU’s state aid regime, which has evolved over 60 years, was designed to avoid costly subsidy races that pitted one member state against another.

The new state aid guidelines imposes conditions aimed at easing the concerns of southern and eastern member states who argue that by relaxing state aid rules, the commission would in effect allow the wealthiest countries, notably Germany and France, to subsidise their industries to the detriment of others.

Energy security is top priority for 2023

Energy security concerns outweigh clean and affordable energy on the list of priorities for energy companies globally, as the industry says the energy system will not resolve the energy trilemma in the next decade, according to DNV’s research analysing the views of more than 1300 senior energy professionals.

Resolving the energy trilemma – delivering secure, clean, and affordable energy – is viewed by the energy industry as a long-term goal. But few in

the industry (17 per cent) believe the transition will deliver secure, clean, and affordable energy in the next decade, to all parts of the energy system in their country. Most (41 per cent) see this being achieved in 10-20 years, while a sizable group (32 per cent) believe this crucial outcome of the energy transition will not be realised until well into the 2040s.

“The energy trilemma is in focus in 2023 as the energy system struggles on all three aspects. Russia’s invasion of

Ukraine has reminded the world how fragile energy security can be; coal plants are being fired up while renewables projects come under pressure; and energy consumers are being pressed on the cost of energy,” said Ditlev Engel, CEO, Energy Systems at DNV. “The trilemma is also in transition. In a complex and difficult year for the energy industry, we see the trilemma leading to competing priorities.

“But in a decarbonised energy system, energy sustainability, affordabil-

ity, and security actually all pull in the same direction, and the public and private sector can resolve the trilemma through a new approach to scaling and implementation.”

Some 80 per cent of professionals in the renewables sector believe energy security concerns will lead to increased investment in renewables this year, while a majority (61 per cent) from across the energy sector say their company can become more profitable by improving sustainability.



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South America will see wind and solar capacity up five-fold by 2030

■ Natural advantages boost opportunity ■ Progress has slowed in Mexico after reforms

Janet Wood

South America is set to multiply its wind and solar capacity by nearly 500 per cent by 2030, with 319 GW in the pipeline, according to a new Global Energy Monitor (GEM) report – adding one billion solar panels.

GEM said the new capacity was equivalent to about 70 per cent of current capacity across all generation sources, which is 457 GW, and Kassandra O'Malia, GEM's Project Manager, said that will make the region a "leading" global player in renewable

energy production. She said that the region appears to be at a tipping point and more projects are likely to be announced in the coming years.

Brazil is in front with 27 GW of large-scale solar and wind plants in operation and another 217 GW expected by 2030. That has been boosted by a 2012 law that incentivised solar energy in Brazil by allowing private producers to sell electricity directly to the grid, according to Roberto Zilles, Director of the Energy and Environment Institute at the University of São Paulo, who told *AFP*

"today it is cheaper to produce your own energy" than to buy it.

In installed generation, Chile is next with 20 GW, representing 37 per cent of capacity, then Mexico (10 GW) and Argentina (5 GW).

The report highlights the region's large potential as a producer of offshore wind energy. "The region is at a turning point where it is important to support projects that can turn it into a global energy giant," said O'Malia.

Some countries are racing to add more capacity – Colombia said it plans to install 37 GW of solar and wind

energy by 2030 – but progress has slowed in some countries. Mexico is currently home to the largest solar and wind projects in Latin America but the report says that after reforms in 2021, "even if all potential projects were put in place, the country would only reach 70 per cent of its commitment to generate 40 GW of solar and wind power by 2030".

South America has natural advantages, as most countries have "high solar irradiation and great potential for offshore wind development", according to the report.

"Together with existing distributed and smaller-scale solar capacity, Latin America is on track to meet, and potentially exceed, the 2030 renewable energy targets of the International Energy Agency," GEM said.

The International Energy Agency said in a report in December that renewables will become the largest source of global electricity generation by early 2025, overtaking coal.

O'Malia said the rest of the world should follow Latin America's lead, saying, "the rest of the world is not doing its part".

Equinor and Petrobras step up offshore wind collaboration



Petrobras and Equinor have signed a letter of intent that expands the cooperation between the two companies in Brazil. The two companies now plan to assess the technical, economic, and environmental feasibility of seven offshore wind power generation projects off the Brazilian coast with the potential to generate up to 14.5 GW.

"This agreement will pave the way for a new frontier of clean and renewable energy in Brazil, taking advantage of our country's significant offshore wind potential and boosting our trajectory towards the energy transition," said Petrobras President and CEO Jean

Paul Prates.

The agreement extends a partnership signed between Petrobras and Equinor in 2018, initially covering just two wind farms – Aracatu I and II (located on the coastal border between the states of Rio de Janeiro and Espírito Santo). Equinor has had an oil and gas portfolio in Brazil since 2001 and regards the country as a core market.

Petrobras is working on diversifying its portfolio and its Strategic Plan for 2023 to 2027, names offshore wind as one of the priority segments. The company wants to neutralise emissions in activities under its control by 2050.

Fires affect power grid supplies in Argentina and Cuba

Fire in farmlands was the cause of two recent major backouts in South America.

Most of the Buenos Aires metropolitan area and several Argentine provinces were without electricity for two hours after a fire in some pastures affected three high-voltage transmission lines in the Litoral area. The incident took the Atucha I nuclear power plant out of service as a safety precaution, the country's national nuclear power authority Nucleoelectrica said.

The loss of the nuclear station had knock-on effects on Argentina's inter-connection system (SADI). The blackout affected more than six million households. "The blackout is big, it affects several provinces. At a time of

high temperatures like today in much of the country, the electricity sector was demanding 25 000 MW, and with the fire, 9000 MW were lost. This caused a breakdown in the system," Undersecretary of Energy, Santiago Yanotti, explained to channel C5N.

He said power demand had soared due to the record-breaking high summer temperatures driving demand for air conditioning.

In Cuba a power failure left 11 of the country's 15 provinces without power, with blackouts stretching from Matanzas, about 100 km to Guantanamo in Cuba's far east. A fire on a sugar cane plantation that damaged transmission lines left half of the country without electricity.

Offshore wind auctions set to open in New Jersey and Gulf of Mexico

The New Jersey Board of Public Utilities (NJBP) has given the go-ahead to a third offshore wind auction, which will add 1.2 GW and 4 GW to its previously awarded 3.75 GW.

NJBPU anticipates making a decision on the submitted applications by the end of 2023.

New Jersey Governor Phil Murphy wants the state to have 11 GW of offshore wind by 2040. He said: "Offshore wind constitutes a crucial component

of our journey to 100 per cent clean energy by 2035, a benchmark that solidifies our position at the national forefront of climate action."

Meanwhile the Bureau of Ocean Energy Management (BOEM) is preparing to auction up to three lease areas in the US Gulf of Mexico – the first offshore wind leases in the area. The leases will be within two areas already identified, 24 miles off the coast of Galveston Texas (546 645 acres) and

56 miles off the coast of Lake Charles, Louisiana (188 023 acres).

Avangrid Renewables, Bluepoint Wind, Shell New Energies US, Enterprise Energy USA, Hecate Energy Gulf Wind, TotalEnergies Renewables USA, and US Mainstream Offshore have already prequalified. Shell and TotalEnergies have already secured offshore wind leases on the US East Coast and operate oil and gas assets.

President Biden budget would shift support from oil and gas to clean tech

■ Tax relief for fossil fuels to be slashed ■ Funding increase for offshore wind delivery agencies

The Biden-Harris administration wants to shift support from oil and gas companies to wind and solar in the US President's new budget for Fiscal year 2024.

The proposed budget supports federal agencies' work on the next National OCS Oil and Gas Leasing Program, but it would cut support for corporates by eliminating tax subsidies for oil and gas.

The administration highlighted a year of "record profits" for oil and gas companies and a series of stock buybacks that benefited executives and shareholders. It said over the same period the companies had cut their investment as a share of operating cash flows to the lowest levels in a decade. A White House statement said: "The President is committed to ending tens of billions of dollars of federal tax subsidies for oil and gas companies." It added: "The budget saves \$31 billion by eliminating special tax treatment for oil and gas company investments, as well as other

fossil fuel tax preferences."

The Conventional Energy Program would see funding of \$72.3 million for the US Department of the Interior's Bureau of Ocean Energy Management (BOEM) to develop the next National OCS Oil and Gas Leasing Program, including for carbon capture and storage. "The FY 2024 budget will ensure the effective launch of that program and allow for reviewing new proposals for carbon storage projects, as well as related environmental analyses," said BOEM.

The budget proposed to increase funds for new and renewable energy. It wants \$64.5 million for the BOEM's renewable energy programme – up \$21.6 million on the current year and including an extra \$12 million to support permitting associated with the current offshore wind leasing programme.

BOEM said: "In FY 2024, BOEM will maintain an all-of-government approach by collaborating with multiple government agencies and states,

and consulting with Tribal Nations to expand responsible offshore wind development.

BOEM aims to run efficient, transparent, and inclusive processes to identify future lease sale areas; avoid, reduce, and mitigate conflicts; and advance projects.

BOEM will also work with the Governors of U.S. Territories to explore the potential of offshore wind lease sales in federal waters off their coasts, as authorised by the Inflation Reduction Act (IRA)."

The budget also proposes to increase funding for BOEM's environmental programmes by \$10.4 million to \$92.8 million. The proposal would boost the funds available for environmental reviews.

The budget would also support offshore wind with \$60 million to expand permitting activities at the National Oceanic and Atmospheric Administration and \$75 million for the DOE to develop domestic supply chain capacity.

Indonesia eyes nuclear in clean energy transition

- US partnership could see deployment of small reactors
- First phase launched of mandatory carbon trading for coal power plants

Syed Ali

Indonesia has its sights set on nuclear power, as it makes its transition to clean energy. Last month the government announced a strategic partnership with the US that will enable the development and deployment of small modular reactor (SMR) technology to meet the country's energy security and climate goals.

Indonesian Coordinating Minister for Economic Affairs Minister Airlangga Hartarto, US Ambassador to Indonesia Sung Y. Kim, US Department of State Principal Deputy Assistant Secretary Ann Ganzer, and the US Trade and Development Agency (USTDA) formally announced the Memorandum of Agreement and affiliated grants and contract signing as a deliverable under the Partnership for Global Infrastructure and Investment (PGII).

Under the agreement, which ad-

vances the goals of the Just Energy Transition Partnership (JETP), the USTDA has awarded a grant to PLN Indonesia Power (Indonesia Power) to provide assistance to assess the technical and economic viability of a proposed SMR power plant to be located in West Kalimantan.

In addition, the cooperation will include \$1 million in new funding for capacity-building for Indonesia, building on its existing partnership under the US Department of State Foundational Infrastructure for the Responsible Use of SMR Technology (FIRST) Program.

Indonesia Power selected Oregon-based NuScale Power OVS, LLC (NuScale) to carry out the assistance in partnership with a subsidiary of Texas-based Fluor Corporation and Japan's JGC Corporation.

The proposed 462 MW facility would utilise NuScale's SMR technology and advance Indonesia's clean

energy transition.

In a separate announcement, the provincial government of Bangka Belitung Islands of Indonesia said it is studying the feasibility of a thorium-based nuclear power plant on Gelasa Island in Central Bangka district.

Acting Governor of Bangka Belitung Islands Ridwan Djamiluddin, said: "The focus of the energy transition programme is not only terminating the operation of coal fired power plants, but how much Indonesia is committed to contributing to supporting other industries in utilising new and renewable energy."

Last month the Ministry of Energy and Mineral Resources of the Republic of Indonesia (MEMR) signed a Memorandum of Understanding (MoU) with the Global Energy Alliance for People and Planet (GEAPP) to accelerate its just energy transition.

The MOU with GEAPP sets out a practical framework of cooperation to

realise these commitments and accelerate Indonesia's move away from fossil fuels. Working alongside the Ministry of Energy and Mineral Resources, GEAPP will support the advancement of Indonesia's JETP plan, by delivering capacity building and knowledge sharing, and supporting analysis into the acceleration of coal decommissioning.

Indonesia is the second country in southeast Asia to collaborate with GEAPP on its just energy transition during 2023, with a set of three MoUs signed between GEAPP and the Vietnamese government in February.

The MOU builds on Indonesia's ambitious energy transition programme following commitments made at COP26 to reach net zero by 2060 or before.

This plan received a boost in late February with the launch of the first phase of mandatory carbon trading for coal power plants in the country.

Coal makes up more than half of Indonesia's power generation. The first stage of a carbon trading mechanism will cover 99 power plants with a total installed capacity of 33.6 GW directly connected to power grids owned by state utility Perusahaan Listrik Negara (PLN).

"There are 500 000 tonnes CO₂ equivalent ready to be traded," said energy ministry official Mohamad Priharto Dwinugroho.

Dwinugroho said a market mechanism would set the price. According to an energy ministry study, this price may range between \$2 and \$18 per tonne.

Indonesia's carbon trading applies to power plants with a capacity of at least 100 MW. Energy Minister Arifin Tasrif said, however, it would later be rolled out to smaller coal plants and other fossil fuelled power plants, as well as power plants not connected to PLN's grid.

China's pursuit of coal jeopardises 1.5°C target

A surge in China's coal power generation is threatening global efforts to limit global warming to 1.5°C, according to a report by think-tank E3G.

The UK-based organisation said China's coal project pipeline grew by nearly 50 per cent in the last six months of 2022 taking the total to 250 GW. This trend, it says, is in stark contrast with the rest of the world, where combined coal power plant capacity shrank to 97 GW over the same period – the lowest level in modern history.

Notably, China is still a global leader in the rollout of renewable energy, adding clean energy projects to the grid almost as fast as the rest of the world combined. Renewable power capacity additions have remained at record levels, with solar installations at 87 GW in 2022 and expected to rise further in 2023.

But Leo Roberts from E3G's coal transition programme said the country's coal expansion is a "direct threat" to the Paris Agreement goal.

"Every new coal power station that comes online increases the scale of the challenge to decarbonise the global economy," said Roberts. "China's coal boom is actually undermining significant progress away from coal in all other parts of the world."

E3G analysis shows that new coal power proposals in China had collapsed by 75 per cent between 2015 and July 2022. Now China accounts for 72 per cent of total global planned coal capacity.

Geopolitical tensions affecting global energy prices and domestic power supply issues have prompted

Beijing to look to coal as a way of boosting energy security.

Last year China experienced widespread power outages, as heat waves increased electricity demand for cooling, while drying up water reservoirs necessary for hydropower generation in the country's southwestern provinces. Meteorological agencies predict another round of record high temperatures and more droughts this year.

According to research by the Centre for Research on Energy and Clean Air (CREA) and Global Energy Monitor (GEM), China approved the construction of another 106 GW of coal fired power capacity last year, four times higher than a year earlier and the highest since 2015.

"The speed at which projects progressed through permitting to construction in 2022 was extraordinary, with many projects sprouting up, gaining permits, obtaining financing and breaking ground apparently in a matter of months," said GEM analyst Flora Champenois.

Many of the newly approved projects are identified as "supporting" baseload capacity designed to ensure the stability of the power grid and minimise blackout risks, the CREA-GEM report said.

However, many are being built in regions, which already have a clear capacity surplus, and power supply problems would be better addressed by improving grid reliability and efficiency, the authors said.

China says it aims to bring its climate-warming carbon dioxide emissions to a peak by 2030.



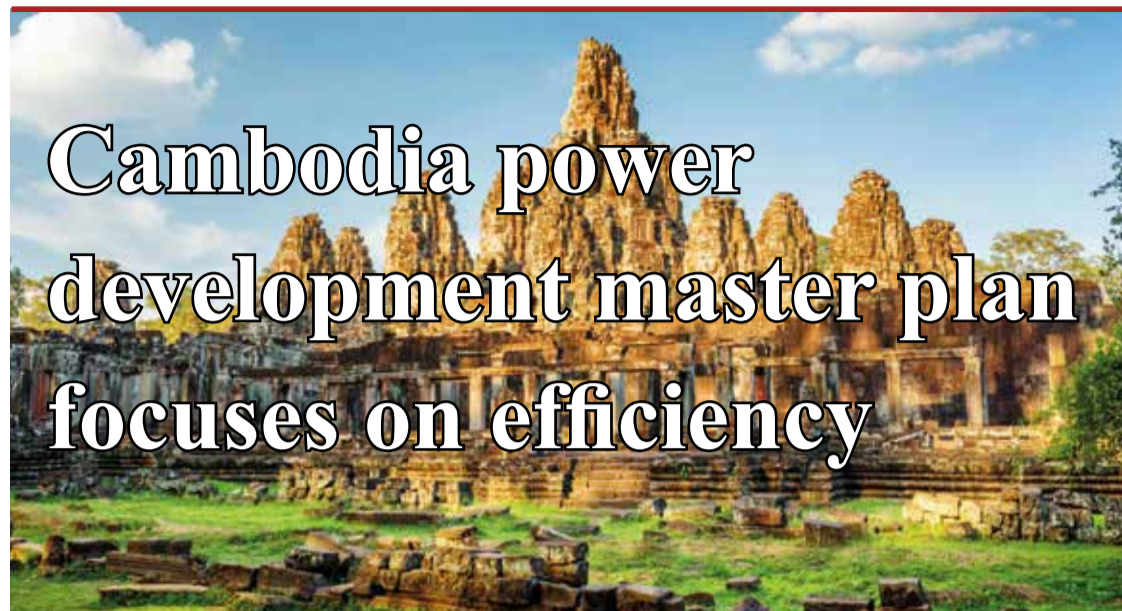
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Cambodia has launched a long-term power development plan, which for the first time includes specifics on energy efficiency.

Last month the Ministry of Mines and Energy approved its Power Development Masterplan (PDP) and at the same time presented a National Energy Efficiency Policy (NEEP).

The PDP is Cambodia's first long-term plan for its power sector, comprising a broad range of scenarios for a 20-year planning period covering electricity demand growth, the expansion of power generation sources, and the development of the transmission and distribution network.

The NEEP is Cambodia's first dedicated policy on energy efficiency and establishes the enabling framework for future developments in this area. The NEEP sets an ambitious national target for the reduction of energy consumption of at least 19 per cent by 2030 in relation to a scenario without

energy efficiency.

The NEEP also identifies measures and instruments that the government will prioritise and develop to support the wider adoption of energy efficiency in the country.

Cambodian Minister of Mines and Energy Suy Sem highlighted the significance of these policies to drive Cambodia's energy transition and meet international commitments under the Paris Agreement.

"Cambodia is committed to maximising the adoption of renewable energy and energy efficiency, which will also support the government's efforts to provide energy in a reliable, stable, and affordable manner," he said.

The Asian Development Bank (ADB) provided technical assistance in developing the PDP and the NEEP.

The news came as a proposal was approved to export power from Cambodia to Singapore, with Singapore-

based Keppel Energy being granted conditional approval by the Energy Market Authority (EMA) to import 1 GW of electricity from Cambodia.

The proposal will see the imported electricity harnessing solar energy, hydropower, and potentially wind power, supported by battery energy storage systems or pumped storage hydropower, said EMA in a media release.

It will be transmitted from Cambodia to Singapore via new subsea cables of more than 1000 km. A Keppel Infrastructure spokesperson said the project will require the enhancement of existing infrastructure and the building of new infrastructure.

"The planning and implementation are multi-step processes, including Environmental Impact Assessment, and are subject to future development works, which could be undertaken by separate consortia," said the Keppel spokesperson.

Vietnam eyes offshore wind in renewables transition

- Offshore wind capacity could hit 7 GW by 2030
- Norway to share experience

Syed Ali

Vietnam is developing a regulatory framework for offshore wind projects as the country embarks on a roadmap to reduce coal fired power generation in an effort to achieve net zero by 2050.

Vietnam has strong winds and relatively shallow waters near populated areas. This untapped potential could generate up to almost 30 per cent of the country's total electricity output by 2050, according to World Bank estimates.

Under the latest draft of its power development plan, the southeast Asian country has set a target of 7 GW from offshore wind and 16.12 GW from onshore wind by 2030, as it sees wind power as a key technology in accelerating the adoption of renewable energy and ensuring national energy security. It aims to raise its installed offshore wind power generation capacity to 64.5 GW by 2045.

As of the end of 2021, Vietnam's total installed capacity of renewable energy reached 20.7 GW, equivalent

to more than 27 per cent of the cumulative installed capacity of the electricity system.

Global investors are looking for investment opportunities in Vietnam to build wind turbine farms, including Denmark's Copenhagen Infrastructure Partners, which has already signed a memorandum of understanding with the central province of Binh Thuan to develop a 3.5 GW offshore wind farm.

At the start of March Norway said it is willing to share experiences and cooperate with Vietnam in the field of offshore wind power.

During a meeting between Erling Rimestad, State Secretary of the Norwegian Ministry of Foreign Affairs, and Vietnam Deputy Minister of Industry and Trade, Dang Hoang An, both sides agreed that in the future, the government, businesses, and investment fund of Norway should consider support in order for Vietnam to continue with its policy of investing in research and implementation of green energy projects in areas such as offshore wind power and hydrogen production.



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Europe News

Offshore wind installations slow as concerns over returns rise

- Investment climate has turned stormy
- Offshore connections may slow delivery

Janet Wood

Europe must go faster to install offshore wind to meet its climate goals, according to a new report from WindEurope. The group's annual statistics revealed that 19 GW of new wind capacity came online in Europe in 2022, 40 per cent up on 2021. But the EU needs to build on average 31 GW every year up to 2030 and new wind turbine orders were down in 2022.

The group said EU and national governments must restore investor confidence and help the European wind

supply chain grow. "Permitting is still the number one bottleneck for the expansion of wind in Europe," said WindEurope Chief Executive Giles Dickson, but the EU is finally making progress in simplifying permitting rules and procedures.

Wind projects are being developed – the Lithuanian government is expected to announce its first offshore wind auction for a 700 MW wind farm due to be commissioned by 2028.

However, wind groups are increasingly concerned about the investment environment for offshore wind.

First, higher commodity and other input costs have added 25-40 per cent to the price of turbines but wind farm developers are often stuck with a revenue base that does not reflect that rise. Energy UK's Deputy Director, Adam Berman said "there are real concerns that the government hasn't properly recognised the cost increases and other challenges that have accumulated for renewables projects over recent months". It was also noted that national governments have intervened in the markets.

The Irish wind industry said there

were now "massive levels of uncertainty" after the Irish government approved a new framework for offshore wind. The auction for Phase One offshore wind farms was launched by EirGrid in December 2022 and will be completed shortly.

But Noel Cunniffe, Chief Executive of Wind Energy Ireland, said of Phase two: "This is a radical change in policy from government that has created massive levels of uncertainty among international investors and the global supply-chain." Now state agencies have to identify Designated Marine

Areas for new projects.

In addition, Phase Two wind farms have to be connected to offshore substations designed and built by EirGrid. That would be the first offshore connection by EirGrid but such links are set to multiply across the North Sea.

Germany's Federal Ministry for Economic Affairs and Climate Protection, presented initial plans for interconnecting offshore wind farms in the North Sea, saying they are to be interconnected and will allow for the exchange of electricity with Denmark and the Netherlands.

Europe reveals split over nuclear's future

- German plants close while UK sees life extension
- Disputes over 'Green' classification

Janet Wood

Germany is set to close its last three nuclear power plants on April 15th in a government-mandated shutdown delayed for three months while replacement sources were secured.

Environment Minister Steffi Lemke said: "Betting on the development of renewables will, in the long run, be the best way to guarantee price stability in the sector."

The decision is in stark contrast to the UK, where EDF said it would extend the operating life of the Heysham 1 and Hartlepool plants by two years

to March 2026.

Heysham 1 station Director Martin Cheetham said: "Heysham 1 has been powering the North West for 40 years... We also have an eye on the future and believe Heysham is the perfect site for new nuclear."

The future for nuclear has split countries in Europe. Eleven European Union (EU) countries, led by France, pledged recently to "strengthen European cooperation" around nuclear energy, which they see as an effective way to combat climate change. "Nuclear energy is one of the many tools that allow us to achieve our climate

objectives, produce baseload electricity and ensure security of supply," France, Bulgaria, Croatia, the Czech Republic, Hungary, Finland, the Netherlands, Poland, Romania, Slovakia, and Slovenia said in a statement.

Some are taking forward plans for new nuclear. Poland recently signed a pre-design contract intended to allow PEJ and Westinghouse to begin preparatory works for its first nuclear power plant.

Climate Minister Anna Moskwa said: "We are committed to signing the next contract, which will strengthen our cooperation even more, later

this year."

Outside the EU, the UK has long-standing plans to build a new nuclear plant at the Sizewell site, following on from a similar plant on the west coast at Hinkley Point. The UK now says it does not expect to have investment plans in place for Sizewell C until the end of 2023.

The attractiveness of the project as an investment was improved recently when the UK decided it could be classified within a so-called taxonomy of 'green' low-carbon power sources. That is expected to make it easier to secure investment.

The EU also included nuclear in its 'green' taxonomy but European commissioners remain at odds over the inclusion.

Promoters of nuclear included European Commission President, Germany's Ursula von der Leyen, and France's Thierry Breton, the internal market commissioner. The opposing camp was said to include Frans Timmermans, the EU's Climate Commissioner and former Dutch foreign minister, and Denmark's Margrethe Vestager, the bloc's competition chief, as well as four other commissioners from southern and central Europe.

No net zero without storage investment, says EASE

The European Association for Storage of Energy (EASE) has called for an EU-wide energy storage strategy to complement the Net-Zero Industrial Act.

It welcomed the act, especially because it included both electricity and heat storage in its definition of net zero technology. But it said deploying enough storage capacity by 2030 and 2050 is crucial to decarbonisation targets while ensuring energy security.

Noting that the European Parliament

recommended an EU-wide strategy in 2020, the Association called for shorter permitting with one-stop-shops, better access to financing for manufacturing, skilling-up workers and regulatory sandboxes, as well as inclusion of cooling technologies.

Two Europe-wide initiatives have already been published alongside the Net Zero Industry Act: the Critical Raw Materials Act; and more flexible State Aid rules.

At the launch of the Act, Ursula von der Leyen, President of the European

Commission, said: "We need a regulatory environment that allows us to scale up the clean energy transition quickly. The Net-Zero Industry Act will do just that. It will create the best conditions for those sectors that are crucial for us to reach net zero by 2050: technologies like wind turbines, heat pumps, solar panels, renewable hydrogen as well as CO₂ storage. Demand is growing in Europe and globally, and we are acting now to make sure we can meet more of this demand with European supply."

UK plans multi billion investment in CCS

The UK government has announced plans to invest £20 billion in carbon capture and storage (CCS) over the next 20 years.

Chancellor Jeremy Hunt claimed it was "time for a clean energy reset". He said: "That is why we are fully committing to nuclear power in the UK, backing a new generation of small modular reactors, and investing tens of billions in clean energy through carbon capture."

The country aims to capture and

store 20-30 million tonnes of CO₂ a year by 2030. Investment is focused at 'industrial clusters' that face the need to decarbonise, most around the coast. The government expects that the clusters will be able to access capital funding through the CCS Infrastructure Fund and Net Zero Hydrogen Fund, and revenue support mechanisms through technology-specific business models.

Anne-Marie Mountfield is Director of The Solent Cluster, which already

has 55 members.

She said: "As we have the potential to capture and store a third of the government's annual ambitions for CCS, the impact of this for the Solent region and beyond is significant." She noted that "40 per cent of all industrial CO₂ ever captured has been successfully captured by one of the Cluster's founding members ExxonMobil".

The Solent Cluster is developing a CCS solution drawing on ExxonMobil's experience.

Europe needs hydrogen backbones in North and Baltic Seas

Hydrogen produced from offshore wind should be exported via a 'backbone' pipeline according to a new report from DNV. The EU expects demand for climate-neutral hydrogen to reach 2000 TWh by 2050 and DNV says 300 TWh of hydrogen could be produced by wind farms in the North Sea by 2050.

The report said that hydrogen production by offshore wind above 100 km from shore in the North Sea, with a pipeline, is cheaper than onshore hydrogen production. In the Baltic Sea a combined pipeline requires Sweden and Finland to produce hydrogen and transport it to demand in southern Europe.

Meanwhile the UK and Norway will strengthen cooperation on hydrogen

after signing an expanded Memorandum of Understanding (MoU). "We have had a close cooperation with Great Britain for many years on carbon capture and storage, and I am pleased that we are now strengthening our partnership to also include hydrogen," said Terje Aasland, Minister of Petroleum and Energy.

In addition Lhyfe and Centrica signed an MoU to collaborate on a pilot green hydrogen production site in the Southern North Sea and later deploy the technology at commercial scale. Colin Brown, UK and Ireland Country Manager of Lhyfe, said: "Offshore electrolysis coupled with hydrogen storage will maximise the huge potential of offshore wind around the UK."

Offshore wind can deliver on developing countries' climate and economic goals

- 3.5 GW in five years to boost economy by \$12.5 billion
- 130 000 full-time equivalent work-years created

Nadia Weekes

Faster wind deployment can help developing countries grow their economies and deliver on climate goals, according to a new report from the Global Wind Energy Council (GWEC) that highlights the enormous benefits of embracing the potential of wind energy.

Five developing countries – Argentina, Colombia, Egypt, Indonesia and Morocco – could add 3.5 GW of capacity in just five years, creating a \$12.5 billion boost for their economies and 130 000 full-time equivalent (FTE) work-years, and a raft of additional benefits in the longer term.

‘Capturing economic opportunities

from wind power in developing economies’, produced in collaboration with consultancy BVG Associates, demonstrates the impact of accelerated wind power deployment on these five countries, and others like them, through clear government policies, streamlined permitting frameworks and efficient transmission networks.

Ben Backwell, GWEC CEO, said the energy transition was an opportunity for countries to grow their economies “on a foundation of clean energy, green jobs and secure power”.

Mike Blanch, Associate Director at BVGA Associates, said it showed a pathway for achieving greater economic growth along with improved energy security and resilience.

The report finds that, with a 31 per cent increase in wind installations between 2023 and 2027, Argentina could see 64 000 more jobs and more than \$1 billion in extra gross value created. For Colombia, increasing wind installations by 44 per cent would deliver almost 150 000 new FTE jobs and an extra \$3 billion gross value for the economy.

Egypt, which has already set out ambitious plans, could see an accelerated approach that would deliver 45 per cent more wind installations. Indonesia has more modest ambitions, but could deliver an extra 115 MW of green electricity, employing more than 50 000 people. Morocco has enormous potential and could add an

extra 638 MW of wind capacity in an accelerated scenario, translating into 75 000 jobs and more than \$1 billion extra gross value for the economy.

In a separate development, leading offshore wind energy developer Ørsted has joined the Global Offshore Wind Alliance (GOWA). Launched last year at COP27 by the International Renewable Energy Agency (IRENA), GWEC and the Danish government, GOWA brings together governments, the private sector, international organisations and other stakeholders to accelerate the deployment of offshore wind power.

Mads Nipper, Group President and CEO of Ørsted, said GOWA had great potential because of its ability

to share learnings and best practices. “Today, it often takes longer to plan than to build an offshore wind farm,” he said. “Governments and the private sector must collaborate to create an enabling regulatory environment and streamline permitting processes.”

According to analysis by the World Bank, more than 71 000 GW of technically extractable offshore wind resources have been identified worldwide. Nonetheless, global installed offshore wind capacity was only 64 GW at the end of 2022.

GOWA aims to have at least 380 GW offshore wind capacity built by 2030 and an installed capacity increase of at least 70 GW per year from 2030.

Uganda plans 2 GW nuclear power plant

Uganda’s energy ministry has signed a memorandum of understanding with South Korean firm Korea Hydro and Nuclear Power Company Limited to build a 2 GW nuclear power plant in Buyende District, eastern Uganda.

“The nuclear project comes at a critical time when nations are dealing with how to ensure energy security for social economic development,” said Uganda President Yoweri Museveni. Uganda has abundant and well-distributed power resources across the country, he added, but needs partnerships to explore new energy technologies, especially as changing weather patterns are making hydropower less reliable.

Since a severe drought in 2005 impacted electricity generation from the Owen falls dam, Uganda has had to resort to “expensive fossil powered

plants”, Museveni said. Uganda’s hydro, biomass, geothermal and other power sources, if fully harnessed, are still considered insufficient to meet electricity demand.

Prime Minister, Robinah Nabbanja, said that nuclear energy was one of the options needed for Uganda to achieve its goal of universal access to electricity for all.

She said the government was committed to enhancing the country’s legal and institutional framework for nuclear energy and that a centre of nuclear excellence was being established at Soroti University to train more local Ugandans to work in the sector.

The new nuclear power plant will cost an estimated \$9 billion and the power it generates will be added to the national grid by 2031.

Lekela acquisition to boost Africa’s renewable energy prospects



Infinity Power, a joint venture between Egypt’s Infinity and UAE’s Masdar, has acquired renewable energy firm Lekela Power from sustainable infrastructure investor Actis (60 per cent) and a Mainstream Renewable Power-led consortium (40 per cent).

Lekela Power operates 1 GW of wind power projects in South Africa, Egypt and Senegal, and has a 1.8 GW project pipeline at various stages of development.

Following the acquisition, Infinity Power becomes the largest renewable energy company on the African continent. Chairman Mohamed Ismail Mansour said the company would build upon this milestone to reach its target of installing and operating 2 GW of greenfield projects by 2025. “We continue to drive efforts that reduce carbon emissions, increase renewable energy sources, and develop

efficient energy solutions for the entire region, in order to achieve our vision of providing clean, reliable and affordable electricity access to people in underserved communities across Africa,” he said.

Infinity Power CEO, Nayer Fouad, said the acquisition, with its potential to bring much-needed stability in power supply to African countries, was “a major step forward for Africa’s future and a significant move in enabling the shift towards sustainable energy”.

Lekela Power CEO, Chris Antonopoulos, said the Infinity Power investment promised to make Lekela’s next chapter “an exciting one” as the company sought to deliver clean and reliable power across Africa.

Collaboration between private and public entities in Africa is essential to address the continent’s energy crisis

“in a sustainable and climate-responsible manner”, according to Samaila Zubairu, Africa Finance Corporation President and CEO.

Infinity Power was established in 2020 to develop utility-scale and distributed solar energy and wind power projects in Africa. Its total capacity of operational projects is 1.3 GW. The company also has 13.8 GW of projects in the pipeline at different stages of development.

Africa’s installed renewable capacity is set to grow from 54 GW in 2020 to more than 530 GW by 2040, according to the International Renewable Energy Agency (IRENA), with solar PV soaring to 340 GW and wind rising to 90 GW.

Increasing renewable energy resources will also drive energy access, with almost half of Africa’s population still without electricity.

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New hydrogen benchmarks launched

General Index has launched daily hydrogen price data that will allow users to compare production costs globally and in real-time, setting up key precursors for determining potential future hydrogen trade flows.

Using models based on actual energy feedstocks, the data provides insight into the world’s key energy pricing hubs: Northwest Europe, Asia and North America. Creating the price benchmarks was a collaborative project between General Index and hydro-

gen expert, Rommel Oates.

Saket Vemprala, Pricing Director for Europe at General Index, said his company was confident that hydrogen would be commoditised and transported globally. “Future global hydrogen traders will receive valuable information and insights from our assessment,” he said.

The General Index model for grey hydrogen, which is produced from fossil fuels, is based on best-in-class Steam Methane Reforming (SMR) as

the base technology, with practical assumptions for the utilisation of the steam. The model utilises a modified version of the grey hydrogen methodology for blue hydrogen, for which the CO₂ is captured. For electrolysis hydrogen, also known as green hydrogen, the base models track, measure and analyse industry-leading Proton Exchange Membrane (PEM) and Alkaline technologies to produce costs based on renewable energy prices in the relevant regions.

Companies News

Energy concerns threaten business profitability and decarbonisation

Energy concerns are threatening businesses' profitability and investment in decarbonisation, according to recent global surveys.

Junior Isles

Businesses around the world remain concerned about the impacts of energy security and prices, which could have a range of environmental, social and economic impacts, say two recent surveys.

According to ABB 'Electrification's Energy Insights' survey of 2300 leaders from small and large businesses across a range of sectors, 92 per cent of respondents feel that the continuing instability of energy is threatening their companies' profitability and competitiveness.

The survey revealed that 83 per cent of business leaders are concerned about the security of their business's energy supply. Over a third (36 per cent) are worried about further rises

in energy costs, while 31 per cent are concerned by power cuts and black-outs, and a quarter by energy rationing. In response, 34 per cent have already increased investment specifically focusing on improving their energy efficiency and 40 per cent are looking to install on-site renewable energy generation to become less dependent on the grid.

The key impacts on businesses due to rising energy costs in the last year include lower profit margins (34 per cent) and cuts to spending in some areas (34 per cent), leading to a shift away from investment in R&D and other business growth initiatives. Over a third (38 per cent) have or plan to reduce technology investment, while a third (33 per cent) expect to cut spending on infrastructure and 31 per cent

foresee a decline in marketing spend.

The survey also finds that business leaders are also concerned about potential impacts of meeting their decarbonisation and sustainability targets.

Respondents said that energy pricing and insecurity could delay progress on climate change, with meeting carbon reduction commitments currently considered less of a priority than reducing energy costs. Over half (58 per cent) of business leaders surveyed said the cost of energy could delay achieving their sustainability and carbon reduction targets by anywhere from one to five years. While reducing energy costs is the top priority for 61 per cent of companies, only 40 per cent currently have reducing carbon emissions within their overall business priorities.

Morten Wierod, President, ABB Electrification, said: "Businesses say they need to insulate themselves from energy prices and insecurity and are re-evaluating current and future spending plans. Taking action to mitigate this is a clear priority, but... With the right approach, it is possible for industry to achieve cost savings without sacrificing competitiveness, workforces or the journey to decarbonisation."

At the end of February Abu Dhabi Sustainability Week and Masdar produced a separate report that found decarbonisation budgets are a significant source of concern, with less than a third of executives believing their funds are adequate.

Following the release of the report executives from 'hard-to-abate' industries called for increased financing

to support decarbonisation efforts. Despite the optimism that exists across the industry, and the emergence of innovative new technologies to capture and store carbon, reliable finance remains a major barrier for accelerating progress for many senior executives.

Some 83 per cent and 62 per cent of senior executives from the Middle East and Asia-Pacific, respectively, highlighted that they are taking steps to reduce emissions but have not set a target date for completion. Further, only 30 per cent of senior executives overall, indicated their budgets will be able to meet decarbonisation needs, and more than 50 per cent are concerned about the impact of global economic headwinds on decarbonisation investment.

Volvo Penta expands into battery energy storage

Marine and industrial engine manufacturer Volvo Penta is expanding its power generation business into battery energy storage systems (BESS).

In a strategic move to supplement its power generation business and tap into new segments, Volvo Penta is launching a modular and scalable solution intended for integration into equipment manufacturers' BESS applications.

"Battery energy storage is increasingly in demand for a variety of applications including utilities, factories, decentralised microgrids and mobile charging stations," said Hannes Norrgren, President of Volvo Penta Industrial. "As our solution is application agnostic, we see huge potential for its adoption. Together with OEMs, our solution provides possibilities to store energy from and add resiliency to renewable solar and wind-powered sources, opening new busi-

ness models that appeal to end customers on their road to net zero emissions."

The key attribute in Volvo Penta's modular and scalable BESS subsystem, says the company, is a high-energy-density and high-power battery system with a "favourable C-rating", which ensures quick and substantial charge and discharge, in response to sudden demand. The battery systems are energy and power-optimised to meet business and operational needs. The system is scalable up to 100s of MWh in energy.

Just days after announcing its entry into battery storage, Volvo Penta unveiled a partnership with Utility Innovation Group (UIG) aimed at US and international markets. The two companies are collaborating to enhance power grid reliability and resiliency through battery energy storage and integration.



Several of Europe's biggest energy companies are now in a stronger position to expand investments in decarbonisation, following stronger than expected financial results.

German giant E.On said it plans to expand its investment programme after it slightly exceeded earnings forecast for 2022 at Group level. At its annual results press conference, E.On CEO Leonhard Birnbaum said: "2022 was an extremely challenging year for us, for all of Europe, and especially for energy markets. Yet, we still managed to achieve a strong result in the crisis year."

The adjusted Group EBITDA rose to €8.1 billion in the 2022 financial year and was thus €170 billion above prior-year earnings and slightly above the forecast of €7.6 to 7.8 billion. E.On's core business of Energy Networks and Customer Solutions laid the foundation for this growth. Its adjusted EBITDA rose from about €6.3 billion in the prior year to roughly €7 billion.

An improved financial structure allows the Group to expand its investment plans for the years ahead. E.On

plans to increase its investments by about €6 billion, or more than 20 per cent, to a total of €33 billion until 2027.

The largest share of the additional investment, about €4 billion, will go toward energy networks, seen as "the backbone of the energy transition". In particular, the ambitious expansion targets for renewables are leading to further increased demand in Germany and Europe to connect these facilities to the network and to expand the network capacity. About 15 per cent of Europe's renewables capacity is already connected to E.On's networks.

CFO Marc Spieker said: "We expect more earnings growth in the next five years and beyond. The foundation for this is the expansion and digital transformation of our energy networks and the growing demand for sustainable customer solutions."

"Our solid financial position enables us to further expand the investments required for this compared to our previous planning."

Portugal's EDP also said it was preparing to boost investment to support renewables growth. It plans to invest

€25 billion through 2026; i.e. increasing its investment rate by 30 per cent to €6.2 billion per year. EDP plans to allocate 85 per cent of the capital to clean energy technology and the remaining 15 per cent to power grids in high-growth, low-risk markets. EDP said it aims to achieve a recurring net profit of €1.4-1.5 billion in 2025.

Meanwhile Spain's second largest electricity company, Endesa, posted a net profit of €2541 million in 2022-77 per cent more than in 2021. The company attributes the increase to the "good performance of the gas business and the high level of operation of the combined cycle power plants".

The growth in practically all its business lines enabled the company to increase its investment to €2343 million in the year just ended (up 8 per cent). For 2023, Endesa predicts a new investment record, raising this figure by 20 per cent.

In 2022, Endesa added just over 900 MW of renewable power, bringing its total to 9300 MW. Its strategic plan calls for adding a further 4400 MW between now and 2025, of which 1400 MW is already underway.

GE and ABB make moves to boost carbon capture

Both GE and ABB have entered into partnerships aimed at boosting the uptake of carbon capture and storage (CCS).

Last month GE Gas Power, part of GE Vernova, and Svante announced a joint development agreement (JDA) to develop and evaluate solid sorbent-based carbon capture technology for

natural gas power generation applications. In addition, GE has made an equity investment in Svante as a part of Svante's US \$318 million Series E fundraising round in December 2022.

According to Claude Letourneau, Svante's President and CEO, the JDA will focus on further development of its technology "aimed at decarbonising

natural gas fired turbines in a cost-effective, environmentally responsible manner".

In a separate development to "make the capture, transportation and storage of industrial carbon dioxide emissions more accessible", ABB signed a partnership agreement with Pace CCS.

Together, the two companies will

apply their expertise to make it easier for industrial companies to implement CCS infrastructure by lowering the CAPEX and operational investment required to enter this market.

"To date one of the biggest challenges to the mainstream adoption of CCS has been a lack of operational practice across the full value chain,

but the combined expertise of ABB and Pace CCS can change this," said Matt Healey, Chief Executive Officer of Pace CCS. "While companies can see the benefits of CCS, there is still a reluctance to make the investment without clear knowledge of how things will work on the ground, at every stage of the process."

10 | Tenders, Bids & Contracts

Americas

American and Argentine success for Vestas

Vestas has received an order from RPM Access for 13 V150-4.2 MW wind turbines in 4.3 MW operating mode for the 50 MW Prescott wind power project in Iowa, USA. The order includes supply, delivery, and commissioning as well as a 10-year service agreement.

Turbine delivery is scheduled to start on Q4 2023, with commissioning scheduled for Q1 2024.

In addition, Vestas has also won a 95 MW order with Pampa Energia for the Pepe VI project in Argentina. The project involves 21 V150-4.5 MW wind turbines, which Vestas will supply and install at the project site in the province of Buenos Aires, Argentina. Vestas also has a 20-year service agreement for the project.

Turbine delivery is scheduled for Q4 2023, with commissioning expected in Q2 2024.

Andritz wins hydropower rehabilitation order in US

The US Army Corps of Engineers' Nashville District has awarded Andritz a contract to rehabilitate the turbines and generators at the 162 MW Old Hickory hydroelectric power plant on the Cumberland River in Central Tennessee, near the town of Hendersonville.

The Andritz scope of supply includes the design, manufacture, transport, erection, testing and commissioning of three Kaplan turbine generator units with a capacity of 40.5 MW each, along with associated auxiliaries and ancillary equipment, with an optional fourth unit.

Commissioning of the first unit is expected in August 2026.

Asia-Pacific

AFRY to act as owner's engineer for Huon Hoa 1

LIG-Huong Hoa 1 Joint Stock Company has appointed AFRY as owner's engineer for the 48 MW Huong Hoa 1 onshore wind farm in Vietnam.

Huong Hoa 1 will be located in the Quang Tri province in Vietnam, and will consist of eight wind turbines, each of 6 MW capacity, a new 220 kV substation, and a 5 km overhead transmission line to connect the wind farm to the national grid.

AFRY's role includes support in project management, design review, and monitoring of construction and commissioning of the complete project.

Petteri Härkki, AFRY's Regional Director for Asia, said: "We are confident that we can add value to projects like this. We see this as a valuable project in the clean energy transition."

Vestas offshore turbines for Wando Geumil

Vestas Wind Systems has been appointed preferred supplier by Korea South-East Power Company (KOEN) for the 600 MW Wando Geumil offshore wind project in South Korea. The project will be located off the coast of Wando-Gun, South Jeolla Province.

Vestas will supply and install 40 units of its V236-15.0 MW turbine, and will also operate and maintain the wind farm for 20 years. Turbine deliveries are scheduled to start in Q4 2025, and the wind park is due to come online in Q3 2026.

Srdan Cenic, Vestas Korea and Asia Pacific executive, said: "This will be Vestas' first collaboration with KOEN. Through the project, KOEN and Vestas will work together to unleash the potential of offshore wind in the west coast of the country and contribute to South Korea's goal of generating 20 per cent of its energy from renewable sources by 2030."

Europe

Finland and Germany turbine deals for Vestas

Vestas has received 100 MW of orders for hardware for wind projects in Finland and Germany.

Vestas will supply, install, and commission eight V162-6.2 MW turbines, with a 20-year service agreement, at the 50 MW Lappfjard Extension project in Kristinestad municipality, western Finland. The turbines are scheduled for delivery in Q3 2023, and operational by the end of 2023.

Vestas won a contract in Germany from Energiepark Bad Lauchstadt to supply, install, and commission eight V162-6.2 MW turbines for its 50 MW Bad Lauchstadt TerraWatt project in Saxony-Anhalt. The project includes a 25-year service agreement.

The turbines are due to be delivered and installed in Q1 2024, and operational in Q2 2024. They will feed power to supply an electrolyser to generate green hydrogen.

GE wins Greece order for HA gas turbines

Damco Energy has ordered GE's HA combined cycle plant equipment to power the new 840 MW natural gas-fired Alexandroupolis plant in Greece. The power generated by the plant will support the energy transition in Greece.

The supplied equipment will include: a GE 9HA.02 gas turbine, an STF-D650 steam turbine, a W88 generator, an HRSG, and a Mark VIe Distributed Control System. GE will also provide power plant services for 14 years. The power plant is scheduled to start operation in 2026.

Public Power Corporation and DEPA will each participate with respectively 51 per cent and 29 per cent in the share capital of Alexandroupolis Electricity Production, the company that will finance, construct, own and operate the new power plant. Damco is the nominated EPC contractor.

UK battery project to use Sungrow technology

Sungrow Power Supply has struck a deal with Constantine Energy Storage (CES) to supply its liquid-cooled battery energy storage technology for 825 MWh of projects in the UK.

Sungrow's technology will be deployed across five projects, some of which are already under construction. The schemes were developed by Pelagic Energy Developments, which is part of the Constantine Group. CES will acquire them once they become operational and will be the systems' long-term operator.

Construction has been initiated at sites in Ocker Hill, near Birmingham, and Capenhurst, near Chester, with the 57 MW/165 MWh facilities due to be switched on later this year. The remaining projects will be energised in 2024.

Haizea Wind monopiles for East Anglia Three

Iberdrola has awarded a contract to Haizea Wind Group to supply 50 monopiles for Iberdrola's 1400 MW

East Anglia Three offshore wind farm located in UK.

The deal, valued at over €200 million, covers the supply of materials, engineering of the manufacturing process and manufacturing of monopiles.

Haizea will manufacture monopiles at its site in Haizea Bilbao, Port of Biscay.

Building the world's first artificial energy island

The Belgian consortium TM Edison has won the tender to construct the world's first artificial energy island. The construction of the foundations of the Princess Elisabeth Island will begin in early 2024 and will last 2.5 years. After that, the installation of the high-voltage infrastructure can be started. The latter will be necessary for bringing the electricity from Belgium's future offshore wind zone to shore.

The island will be located 45 km from the Belgian coast, and will enable connection of the Belgian grid with that of Britain and Denmark via the Nautilus and TritonLink projects. The Princess Elisabeth Island will be the world's first artificial energy island to combine both high voltage direct current (HVDC) and alternating current (HVAC).

GE wind turbines for Lithuania

GE Renewable Energy has been selected by Inikti to supply wind turbines for the 18 MW Otada wind farm in Lithuania, located near Sakiai city in the southwest of the country.

Inikti, developer and investor of the wind farm, will operate four GE turbines at 5.5 MW derated at 4.5 MW, with a rotor diameter of 158 m. All turbines will be erected on a 151 m tower. Installation of the wind turbines at the project site will take place in Q3 2023.

Gilan Sabatier, GE's Chief Commercial Officer of Onshore Wind International, said: "We're delighted to start a partnership with Inikti... We are also very proud to keep contributing to the energy transition in Lithuania, a country which is one of the most attractive countries in Europe in terms of wind energy potential."

International

Trina signs 500 MW solar deal for Yemen

Trina Solar and Al-Raebi have signed a five-year agreement to supply 500 MW of solar modules for Yemen. Trina Solar will supply Al-Raebi with 100 MW of its n-type i-TOPCon cell technology modules in 2023.

The modules have an efficiency of up to 22.4 per cent, with power reaching 605 W and 695 W for individual modules.

Antonio Jimenez, MD and Vice President, Middle East, of Trina Solar said: "We are proud to bring our latest n-type i-TOPCon Vertex N modules to the region. Last year Trina Solar and Al-Raebi signed a deal to supply 40 MW of n-type Vertex modules to cater to the growing demand for solar energy in the Yemeni market. With the tremendous success that these modules have demonstrated, we are now witnessing an increasing demand this year to purchase the upgraded n-type modules."

Doosan Enerbility to build CCGT in Kazakhstan

Doosan Enerbility has signed a \$2.5 billion contract with Turkistan LLP to build a combined cycle gas turbine

(CCGT) plant in Kazakhstan. Doosan has formed a consortium with Bazis, a local construction company.

The 1000 MW Turkistan power plant will be built in Shymkent in southern Kazakhstan. Being an EPC project, Doosan will be taking on the overall process including the design to equipment supply, installation, and commissioning process, all of which is scheduled for completion by August 2026.

Yeonin Jung, President and COO of Doosan Enerbility, said: "The successful construction of the Karabatan Combined Cycle Power Plant in 2020, despite the challenges of the COVID-19 situation, helped us win the trust of our client, which in turn served as the foothold to win this project."

Upgrade for Al-Fadhili HVDC converter station

Hitachi Energy and Gulf Cooperation Council Interconnection Authority (GCCIA) have signed a contract for the upgrade of the Al-Fadhili HVDC converter station in Saudi Arabia.

Once upgraded, the Al-Fadhili station will enable the exchange of up to 1800 MW between the power grids of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The station will also help maintain the stability of the connected grids.

This upgrade project will replace hardware and software with Hitachi Energy's MACH control and protection system.

The GCCIA allows the sharing of the operational and spinning reserve, which achieves higher efficiency in the use of operating capacities and higher efficiency in the operation of electric power production stations. Furthermore, the link will allow optimisation in electricity generation resulting in reduced CO₂ emissions by minimising the need for additional power generation.

Deloitte to advise on Kuwait privatisation

Kuwait has awarded the transaction advisory contract to advise on the privatisation of its Shuaiba North power plant to Deloitte, as part of its plan to sell part of its public enterprises to the private sector. Deloitte had submitted the lowest bid, at \$4 million.

Deloitte will prepare a feasibility study and evaluation of Shuaiba North's assets for the privatisation process, which is expected to be completed within three years.

Located in Al-Ahmadi province, Shuaiba North Cogeneration Power Plant is an 875.5 MW dual-fuel fired power project that was commissioned in 2020.

Phase 2 of the process includes inviting local and foreign firms for an auction to buy a "strategic" part of the company's capital. The final phase involves the sale of at least 50 per cent of the company to Kuwaiti citizens in a public offer.

Daewoo secures \$790 million deal in Libya

Daewoo Engineering & Construction has secured a contract from General Electric Company of Libya to build gas fired power plants in separate regions of Libya. The deal is worth around \$790 million.

Under the terms of the deal, Daewoo E&C will build gas fired power stations in Libya's Mellitah and Misurata regions.

The construction order was made as the Libyan government needed additional power plants to manage increasing electricity demand during the summer season.



Hydrogen

US government offers \$750 million in loans for clean hydrogen

The Biden Administration is putting its money where its policies are. The US is making loans and tax breaks available to companies and entities to help kickstart the hydrogen industry. New jobs, new energy systems and new, better, cleaner lifestyles, and a healthier planet Earth are on the agenda.

Gary Lakes

The goal is to get the cost of clean hydrogen down to \$1/kg in the next 10 years. Doing so will set the stage for the US to meet energy transition targets such as a 100 per cent clean electricity network and net zero carbon emissions by 2050. While work is ongoing on a global scale to develop clean hydrogen – green hydrogen is made through electrolysis using renewable energy – for a number of applications, the US claims to be pushing the envelope.

Action taken by the administration of US President Joe Biden is credited with creating the conditions for the US to expand investments in hydrogen development. Biden's \$1.5 billion Bipartisan Infrastructure Law, which provides \$1 billion for clean hydrogen research, development, demonstration and deployment, is encouraging American companies and institutions to work towards commercial uses for hydrogen.

And the Inflation Reduction Act of last year is providing huge incentives

in the form of tax credits of up to \$3/kg of green hydrogen. At present, the fuel usually cost \$4-5/kg to produce. The US is also looking to establish a network of clean hydrogen hubs across the country – H2Hubs – that are meant to see hydrogen use dispersed throughout the US.

In mid-March, the US Department of Energy (DOE) announced that \$750 million would be made available for research, development and demonstration efforts to cut the cost of hydrogen production. The funds are the first phase of the \$1.5 billion included in the infrastructure law dedicated to advancing electrolysis technologies and improving manufacturing and recycling capabilities. The disbursement of these funds will accelerate the widespread use of clean hydrogen and play a vital role in achieving commercial-scale hydrogen deployment this decade, a statement from the DOE said.

"Making clean hydrogen from abundant renewable energy provides America with yet another incredibly powerful fuel for many different applications,

from low-emissions use in the construction and manufacturing industries to energy storage to powering our cars and trucks," Jennifer Granholm, US Secretary of Energy said in the statement. "The DOE is accelerating our effort to make this exciting and versatile fuel market-ready within a decade – supercharging America's drive towards an affordable and secure clean energy economy."

The next tranche of the funding – \$500 million – will go towards research, development, and demonstration of improved processes and technologies for manufacturing and recycling clean hydrogen systems and materials.

The US describes clean hydrogen as that produced with zero or next-to-zero carbon emissions. Blue hydrogen is produced by capturing the carbon used in its manufacture and grey hydrogen is made with energy that emits carbon dioxide. Currently, the US produces about 10 per cent of the world's hydrogen (it does not occur naturally), but most of that is grey. Most of the

world's large oil and gas companies are pursuing programmes in carbon capture, storage and utilisation, but this is described as low-carbon fuel and it remains unclear if CCSU will prove viable. Carbon that is captured is usually used to build reservoir pressure and boost production through the method known as enhanced recovery.

The US, and others working for large-scale clean hydrogen production, are looking to apply it to energy-intensive industries such as steel, chemicals, fertiliser manufacture and transportation.

Clean hydrogen can also support the expansion of variable renewable power by providing a means for long-duration energy storage and offers flexibility and multiple revenue streams for all types of clean power generation, the DOE statement said. It said diverse, domestic clean energy across multiple sectors can strengthen US energy independence and accelerate the current manufacturing boom.

Funding is being managed by the DOE's Hydrogen and Fuel Cell Technologies Office and projects are to

address the underlying technical barriers to cost reduction that can't be overcome by scale alone. According to the statement, the projects receiving funding are to aim for commercial-scale deployment that will prove viable over the long-term through future lower-cost and high-performing technology.

The DOE sees the development of a hydrogen economy leading to new energy jobs, a reduction in the emission of greenhouse gases, and strengthening the US position as a clean energy market, along with improving the air quality in communities that have suffered historically from harmful gases.

The Department said it plans to award multiple financial assistance awards covering two-to-five-year periods, and encourages stakeholders from academia, industry, and national laboratories across multiple disciplines and diverse entities to participate. There is a two-stage application process: concept papers must be submitted by April 19, 2023, while full applications are due by July 19, 2023.

Gas

Europe looks to Algeria to reinforce energy security

Economically and politically troubled, Algeria has historically been Europe's third-largest supplier of natural gas after Russia and Norway. With Russian gas supplies now as good as out of Europe's market, Algeria has the opportunity to expand its exports and improve its relations with the EU. Italy in particular is moving to boost investments in the North African state.

Gary Lakes

Russia's war in Ukraine and the plunge in pipeline gas to Europe has widened the European market for Algerian gas. Over the last year, it filled much of the gap for Italy when Russian supplies were halted. The EU has approached Algiers with calls to maintain an energy security relationship but large investments will be needed.

According to a petroleum ministry official quoted recently in the Algerian media, the country has signed contracts worth \$6 billion in the last year that will be invested into the oil and gas sector.

A long-time operator in Algeria, Italy's Eni has put forward a scenario that will boost gas production and increase exports to Italy and other European states. During January, Italy's new right-wing Prime Minister, Giorgia Meloni, visited Algiers accompanied by Eni CEO Claudio Descalzi. Meloni is proposing for Italy the 'Mattei Plan',

named after Eni founder Enrico Mattei, who launched Italy's energy relationships with North African countries after World War II. Under the plan, Italy will focus on Algeria and other North African states for investment and energy returns.

During the visit, Eni and Algeria's state-owned oil and gas company Sonatrach signed a number of memoranda of understanding regarding future cooperation. Eni has recently acquired BP's operations in Algeria, including a 45.89 per cent share in the In Amenas gas field, and a 33.15 per cent share in In Salah. The Italian giant has also started production in the Berkine basin, which will boost Eni production in Algeria to roughly 130 000 barrels of oil equivalent per day (boed).

The two countries, and companies, have also agreed to resume the Galsi gas pipeline project, which calls for laying a new subsea pipeline between Algeria and Sardinia, from where it will continue to mainland Italy, and

possibly deeper into Europe. The project will also include an electricity cable and may someday carry green hydrogen produced in Algeria.

Josep Borrell, the EU representative for foreign affairs and security policy, also recently visited Algeria, which he described as a "major partner of the EU in the sector of energy," adding that it plays "a significant role in securing European energy supplies." Borrell also said Algeria has an excellent potential for renewable energy and added that Europe is ready to provide technology and capital to support Algeria with that industry.

In accordance with the 2015 Paris Climate Accord, the EU is looking to move away from natural gas and transition to renewables. It sees Algeria as a prime site for solar-generated power.

Algeria produced 100 billion cubic metres (bcm) of natural gas during 2022, according to government officials. By 2024, Sonatrach expects gas output to rise to 110 bcm. Domestic

demand took about 50 bcm of gas output in 2022 and will demand more in the future. Some 22 bcm was exported to Italy through the Trans-Mediterranean pipeline via Tunisia and Sicily in 2022, while 9 bcm was shipped to Spain through the Medgaz pipeline, and 13 bcm was shipped to Europe as LNG.

The war in Ukraine has prompted fresh talk on the construction of a gas pipeline from Nigeria, where resources are estimated at 200.4 trillion cubic feet (tcf). The Trans-Sahara pipeline would run from southern Nigeria, across Niger to Algeria's gas gathering centre at Hassi R'Mel in the centre of the country. From there, gas would be transported to LNG plants at Arzew and Skikda and to Europe through the Trans-Mediterranean, Medgaz or even the Galsi pipelines.

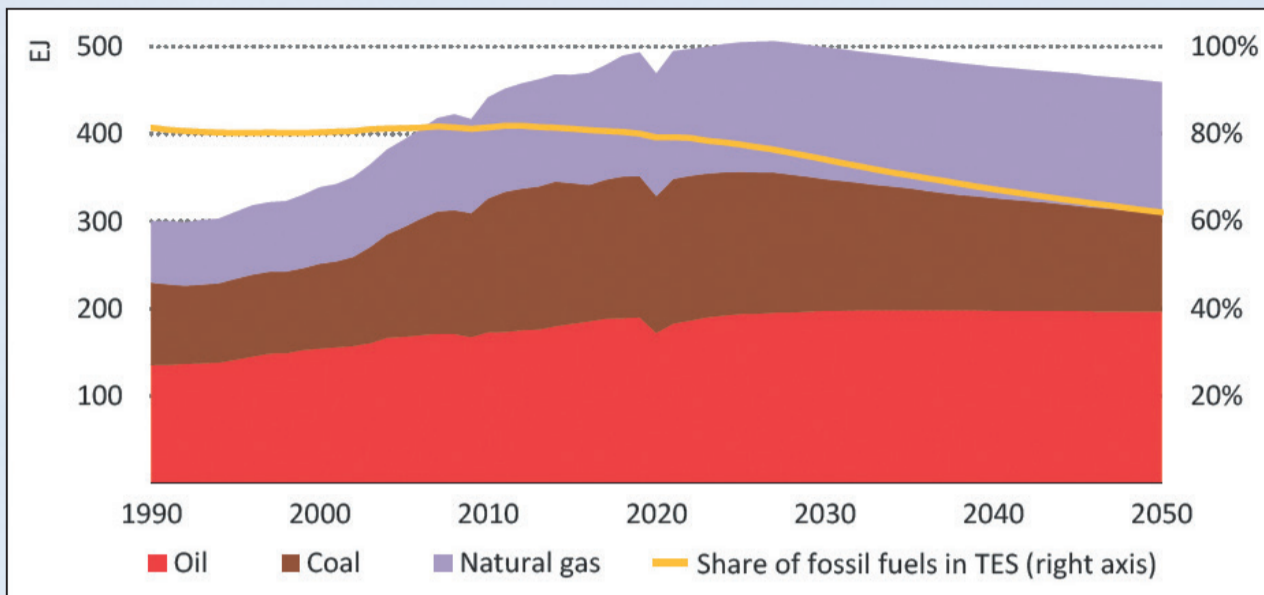
The governments of Algeria, Niger and Nigeria have signed an MOU on the project, which would run 4000 km and cost as much as \$18 billion.

In 2021, Algeria stopped gas shipments through the Maghreb-Europe pipeline, which passes through Morocco on its way across the Gibraltar Strait to Spain because it disagreed with Morocco's plans for the Western Sahara. Since then Morocco has agreed on the idea of a gas pipeline that would pass along the Atlantic coast of West Africa, delivering gas to 13 countries on the way. And from Morocco, Nigeria gas would continue to Spain through the Maghreb-Europe pipeline. Morocco and Nigeria have already signed a number of MOUs with West African states regarding the 6000 km pipeline, which would cost an estimated \$23 billion.

But considering the time it would take to build these pipelines, as well as their costs, moving forward on these projects is unlikely, especially since the ultimate target market is Europe, which is looking to wean itself off natural gas, and not tie itself financially or security-wise to future decades of gas supply.

12 | Energy Industry Data

Fossil fuel demand in the STEPS (Stated Policies Scenario), 1990-2050



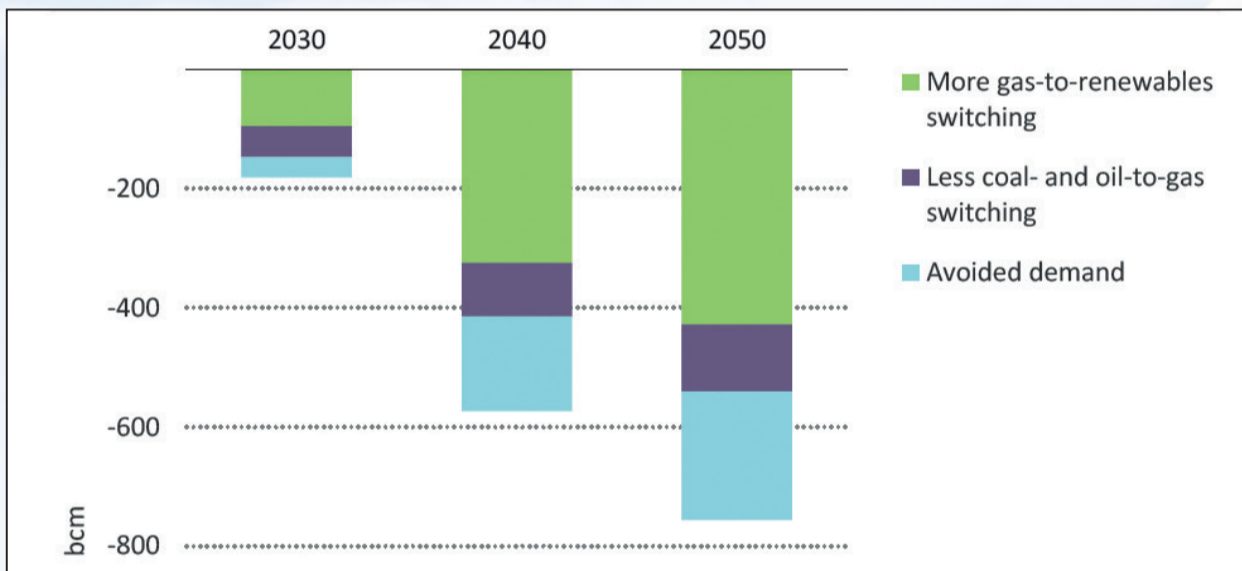
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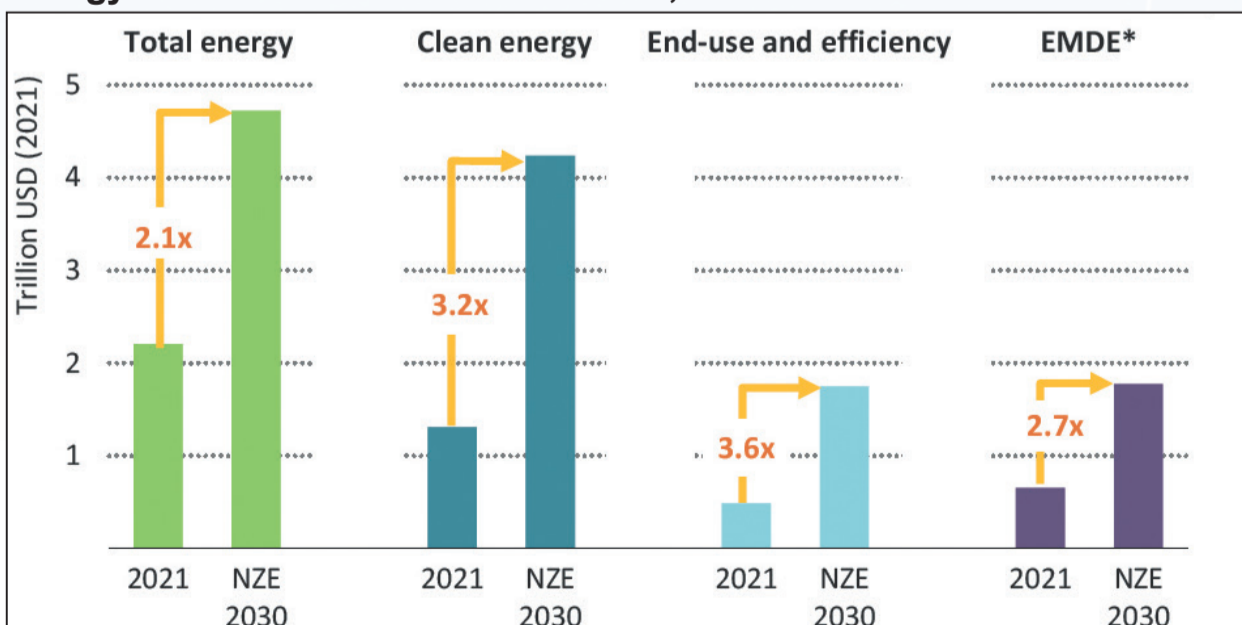
World Energy Outlook 2022, © IEA/OECD, Figure 1.9, page 43

Drivers of change in natural gas demand in the WEO-2022 STEPS relative to the WEO-2021 STEPS



World Energy Outlook 2022, © IEA/OECD, Figure 1.12, page 50

Energy investment in the NZE Scenario, 2021 and 2030



World Energy Outlook 2022, © IEA/OECD, Figure 1.18, page 62

Heat pumps are hot, but could be hotter

Interest in heat pumps is growing as energy consumers look to decarbonise heating and improve energy security. And while there has been a significant acceleration in their deployment, with the volatile gas prices set to continue and an increasing frequency of extreme weather events, even greater urgency is needed to use them in place of fossil fuelled boilers.

Morten Deding

The importance of decarbonising heat in the battle to cut greenhouse gas emissions and mitigate climate change is well known. According to the International Energy Agency (IEA), heat – used for space heating and hot water production for homes, buildings, and industrial processes – accounts for 50 per cent of all energy consumption and 40 per cent of carbon dioxide (CO₂) emissions.

It is, therefore, unsurprising that heat pumps (HPs) are being increasingly recognised as a key technology in tackling the twin challenges of climate change and, more recently, energy security. Yet despite their steady uptake, there is a clear need to act with greater urgency in light of distinct evidence of climate change and the war in Ukraine.

HPs operate by transferring heat from one location to another, using a small amount of energy to move heat from a lower temperature source to a higher temperature environment, such as a home or building. They can draw their heat from many places: hot exhaust gases from industrial plants, wastewater and data centres, renewable heat from the air, lakes, and rivers, even deep geothermal sources, and many more. HPs use locally available heat sources at very low temperatures, increasing overall energy efficiency and reliability.

Unlike boilers, they provide both heating and cooling and, when powered by renewable electricity, significantly reduce carbon emissions compared to fossil fuel-based heating systems. In the build sector alone, when powered by renewables, HPs cut carbon emissions by 100 per cent compared to traditional heating systems. They also have a long lifespan, which helps to reduce overall costs for businesses and households.

HPs are well suited to reducing emissions in the supply of low temperature (<100°C) heat, which, according to the IEA, is the largest source of industrial heat demand today. In recent years there has been a demand for industrial heating and cooling solutions that are increasing in scale and complexity, pushing the envelope in terms of where industrial HPs are being applied.

For cooling, which is a necessity at a dairy production site or an abattoir, there is no option to using a cooling plant but for a heating application, there is always an alternative. Depending on requirements, a plant owner could use a heat pump, a

variety of fossil fuelled boilers, biomass boilers or an electrical boiler.

Typically a HP is more efficient than a conventional boiler from a heating perspective – whether in a district heat application or industrial application. A heat pump might typically have a Coefficient of Performance (COP) of 3-5 (or higher depending on the application), i.e. it can transfer 500 per cent more energy than it consumes. Put another way, it produces 3-5 kW of heat for every 1 kW input of electricity. In contrast, a high-efficiency gas boiler is about 95 per cent efficient, meaning 95 per cent of the energy in the gas comes out as useful heat, with the other five per cent being lost as heat through the flue.

In the energy provider or utility space, HPs can be used as a primary source of generation, replacing fossil fuelled boilers in the generation of heat. Over the years they have been moving into a range of applications with outputs of between 40-70 MW, which would have traditionally been served by a series of boilers or a combined heat and power (CHP) plant.

With the EU adopting the REPowerEU initiative, aimed at ending dependence on Russian fossil fuels by 2027, and the European Parliament recently also adopting the Energy Performance of Buildings directive to put an end to gas boilers by 2035, the need to choose between a boiler and a HP has now become more urgent.

However, the change in energy prices has made the business case more clear-cut.

Determining the optimum business case for HPs involves examining a number of scenarios to assess the outcomes of adjusting various conditions over the period of a year. This allows variations in seasonal ambient conditions and energy costs (electricity vs gas, for example) to be taken into account. Other key inputs are: HP efficiency, load variation, and running hours.

With the price of fossil fuels versus electricity being an overarching factor, it is safe to say that if electricity is very expensive and fossil fuel is cheap, there is generally no case for installing a HP. However, if the COP is higher than the ratio of electricity price divided by heating price, then there is a business case.

Prior to the increase in gas and electricity prices, data from the European Heat Pump Association (EHPA) showed that the average ratio of elec-

tricity price to fuel price across the EU was 2.8. This meant there would be a business case if the COP is better than 2.8.

The increase in gas prices and even bigger jump in electricity prices has now seen that ratio drop from almost 3 to about 2, making the break-even point much lower. If the HP has a COP of 3 and the electricity-to-fuel ratio is 2, this means there is now a 33 per cent saving in energy cost.

Some still, however, point to the higher capital cost of HPs. It is worth noting that various funding and government incentives are available, which make the business case for HPs attractive. In the European Green Deal (EGD) announced in 2019 the Commission allocated €750 billion for initiatives that support investment in environmental technologies; innovation in technologies aimed at decarbonising the energy sector; and more efficient use of energy. Such schemes have seen HP owners in countries like the Netherlands cut two years off the return on investment.

Further, there are also possibilities of various lease-type financing options to lower upfront costs. At JCI, we recently entered a collaboration that now allows us to provide ‘energy-as-a-service’, which enables customers to update technology, fix the price of heating and cooling, while covering any ongoing maintenance. This type of arrangement lowers business risks.

Potential HP installers also need to factor in the increasing taxation on carbon emissions as the price of carbon continues to rise and, crucially, as the EU Emissions Trading Scheme (ETS) has just been also made mandatory for buildings. The International Emissions Trading Association (IETA) predicts that the average carbon price in the EU throughout the 2020s will be €32 per tonne of CO₂ equivalent.

Certainly, the EU’s determination to cut carbon emissions will impact the HP industry in many ways.

The recent EU proposal to further phase down fluorinated gases (F-gases) used as refrigerants in HPs has caused concern. It will be difficult for the EU to bring an additional 10 million HPs to the market by 2027, as targeted under REPowerEU, and ensure security of energy supply if many applications cannot use their existing refrigerant. Limiting F-gas credits will also make it more difficult for the EU to reach its climate target by 2030 as the abated emissions coming from all types of HPs are not taken into consideration when F-gas credits are shortened.

The HP industry acknowledges the need to phase down the use of high global warming potential (GWP) refrigerants by converting to low GWP refrigerants and natural refrigerants wherever possible. But different HP applications call for different refrigerants according to the required performance, and industry needs time to adapt to changes in policy.

The market share for HPs has significantly increased. According to the EHPA, the HP market broke a new record in 2022 according to early data from 16 markets, with around three million units sold. Figures for 2022 gathered by the EHPA



Deding: Potential heat pump installers need to factor in the increasing taxation on carbon emissions as the price of carbon continues to rise and, crucially, as the EU ETS is now mandatory for buildings

indicate growth of almost 38 per cent, more than the previous year’s unprecedented rise of 34 per cent in annual sales.

In March, Members of the European Parliament (MEPs) also voted to speed up the path to the decarbonisation of buildings and in future, end fossil fuel boilers. This will no doubt drive the market to new highs.

Looking ahead, as energy prices increase along with downward pressure on carbon emissions, the incentive for transforming high temperature heat from sources other than fossil fuels will drive the development of very high temperature HPs. This in fact has now become urgent and HP suppliers are already working with end-users to install HPs capable of economically increasing heat delivery temperatures from the current limit of 100°C, to 150°C and ultimately beyond.

While such technical developments could be a game-changer, the market and HP installers should be wary that there are still potential pitfalls that might throw up some bumps in the road.

The huge increase in interest in HPs could lead to a bottleneck across the industry. Already there are long lead times for delivery and installation. It is therefore essential for potential customers to carry out scenario planning for energy needs as early as possible.

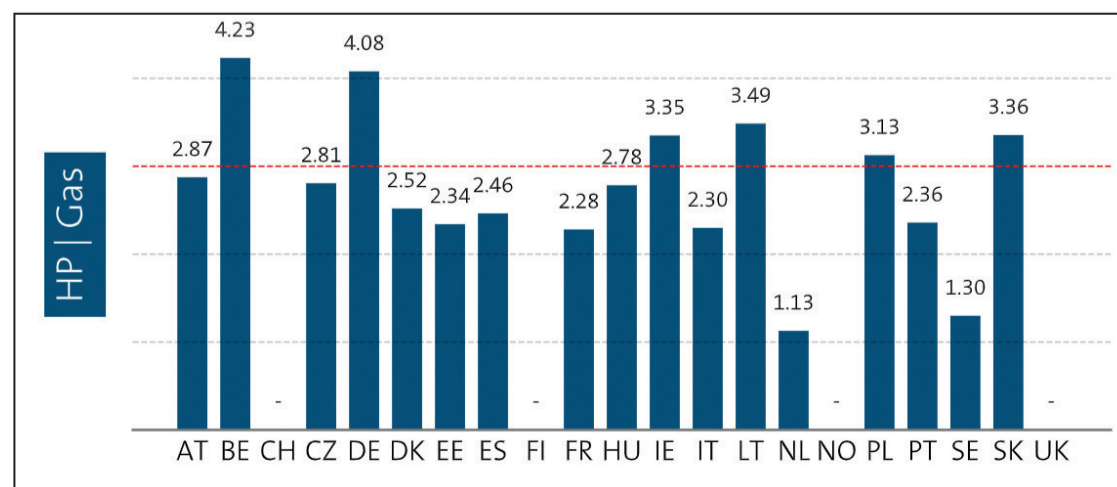
In terms of policy, with some energy planners waiting to see how their governments will deploy green funding, it is now urgent that the full phase-in of the incentive schemes under the EGD is fully completed.

While there are challenges to accelerating HP deployment, such as upfront costs and lack of awareness, these can be overcome with greater education and training, as well as support from policymakers and financing institutions.

With the new regulations from the EU and growing public awareness of the need for sustainable heating solutions, the prospects for the widespread deployment of HPs look increasingly positive for the decarbonisation of heat.

Morten Deding is Heat Pump Product Director BE Europe, Johnson Controls.

Energy price ratios for heat pumps vs. gas. (The red reference line shows a ratio of 3)
Source: European Heat Pump Association



Asian financial regulators are shaking up corporate climate action

Some US politicians have attacked the capital markets' drive for better corporate ESG, including climate-related financial disclosure (CFD). Fortunately, they are the minority. Global financial authorities are now mandating CFD, which is especially crucial for energy corporations in Asia, as it gets them thinking about decarbonisation, including investments in clean energy. **Joseph Jacobelli** explains.

Prominent US politician, and likely 2024 US presidential candidate, Ron DeSantis, has attacked the global capital markets drive towards raising corporate ESG management and standards, including improving corporate CFD. DeSantis and others in the anti-ESG mob argue corporations, including energy companies, should be allowed to focus on making profits and not have to worry about what they see as value destruction issues such as ESG. Fortunately for global climate action, they are very much in the minority camp. This is not the majority view in the US nor is it the global consensus. Corporations around the world must invest resources in addressing ESG issues in general and formulate net zero strategies in particular. They must not just survive but also thrive in a decarbonised world.

'The business of climate strategy: opportunities vs. risks' (*The Energy Industry Times*, February 2023), assessed the multiple pressures corporations face from governments, shareholders, and other stakeholders to adopt sustainability and net zero strategies. It highlighted that corporates' net zero ambitions disclosures in Asia Pacific had lagged European peers but that this should not be looked at as a negative. The amount of disclosure has been ramping up, the slow issuance of rules and regulations had delayed adoption, and as over 85 per cent of the energy consumption in the region is from emerging economies, it gives the bulk of corporations plenty of scope to design meaningful decarbonisation strategies.

But what are the mandates by local financial regulators? And how do they impact corporations?

CFD regulations have gradually

been announced in all major capital market centres worldwide. In the UK, CFD was driven by the Financial Conduct Authority, the regulator, and passed into law in January 2022. In Europe, CFD – known as the EU Corporate Sustainability Reporting Directive – became law in November 2022. In the US, the Securities and Exchange Commission, another regulator, proposed CFD guidelines in March 2022; while not yet adopted, a somewhat diluted version should be finalised soon. CFD guidelines require corporations, typically above a certain size, to be fully transparent about the climate risk aspect of their business.

While there are no global norms on CFD as yet, for EU, US, or UK corporations with operations in other countries, the CFD rules apply to them globally. Two examples: Italian utility Enel will need CFD for its Asia assets in such locations as Australia (solar farm), India (wind), and South Korea (distributed generation); French utility Engie will need CFD for its Asia assets in Australia (renewables and natural gas), India (renewables), Malaysia (solar), Mongolia (wind), Pakistan (natural gas), and Singapore (natural gas). As mentioned in *TEI Times* February 2023 commentary, The International Sustainability Standards Board, a global rules-setting authority, is looking at initial International Financial Reporting Standards (IFRS) – a set of financial statements accounting rules – disclosure standards to go into effect from 2024.

What about corporations in the world's largest energy consuming and emissions emitting region, Asia Pacific? CFD is prospering in Asia too. Five jurisdictions can be highlighted to better explain this impetus,

including Australia, China, Hong Kong, Japan, and Singapore.

While not a large energy consuming and emissions emitting nation, Australia is the region's largest fossil fuel producer and exporter. The nation was slow in endorsing federal-level climate action until a new government was elected in May 2022 (see *TEI Times*, June 2022). The titanic amount of clean energy resources and a renewed decarbonisation motivation has led to a myriad of new policies. This includes the Treasury releasing a CFD consultation paper in late 2022 with the aim to develop "a broad sustainable finance framework for Australia". The momentum inspired the release of climate strategies by the two largest domestic energy utilities in 2022. Origin Energy issued its first Climate Transition Action Plan in August and AGL Energy its strategic review and climate transition action plan in September.

China has the world's most ambitious energy transition plans. It is the world's largest CO₂ emitter, has the largest fossil-fuel generation fleet, and is the biggest electricity and energy consumer. But it is also the world's leading clean energy producer; 2022's output was 2.7 TWh and capacity 1213 GW. In terms of CFD, the People's Bank of China, the central bank, is promoting and standardising corporate environmental information disclosure after issuing specific CFD requirements to financial institutions. The largest generation groups – Huaneng, Huadian, CGN, China Nuclear, China Power, CR Power, State Development, China Energy, Yangtze Power, State Power, and Datang – have all been aggressively adding clean generation and have cut right back on developing fossil-fuel power plants, a trend that has been accelerating.

The Hong Kong government authorities' climate action policies and guidance have lagged China's and that of neighbouring jurisdictions (see *TEI Times*, September 2021). Nevertheless, the Securities & Futures Commission, the regulator, and the Hong Kong Stock Exchange (the seventh largest in the world) have been proactive. In the Special Administrative Region, money managers must now declare their climate-related risk exposure and listed corporations are under a mandatory CFD regime. Two of the three local utilities – CLP Holdings and Hong Kong & China Gas – have energy transition-related plans already and have been investing in clean energy for some time in Hong Kong, on the Chinese mainland and elsewhere abroad.

Climate action by Japan has also lagged others in the region. Still, the nation's regulator, the Financial Services Agency, asked for CFD from 4000 listed companies starting fiscal 2022 (from 1 April 2022) and all others by fiscal 2023. As of now, there seems to be limited action on the part of the biggest power utilities (Tokyo

Electric Power, Jera, Chubu Electric Power, Kansai Electric Power), especially compared to the nation's largest gas utilities (Tokyo Gas and Osaka Gas). Obviously, the new Financial Services Agency requirements will force them to make clear energy transition plans. As they are slow movers, it may take a while. Comparatively, Tokyo Gas, for example, is already executing a transition roadmap to net zero with clear targets, including investments worth ¥2 trillion (\$15 billion) by 2030.

The fifth and last example of CFD adoption and energy transition plans formulation by corporates in Asia, is Singapore. The city state is playing an increasingly important role in green finance and clean energy investments in the Asia Pacific region in general and in Southeast Asia (population of 690 million) in particular. On the finance front, the city state's financial regulator, the Monetary Authority of Singapore, issued CFD rules for corporates. Disclosure for some sectors, such as energy, was made mandatory starting 2023 and for other sectors starting 2024. Local corporates have seemingly been more proactive than the average Hong Kong or Japanese ones. One example is conglomerate Keppel Corp, which has operations in Singapore and another 20 countries. In 2021, it released a plan to cut CO₂ emissions by half by 20230 and reach net zero by 2050.

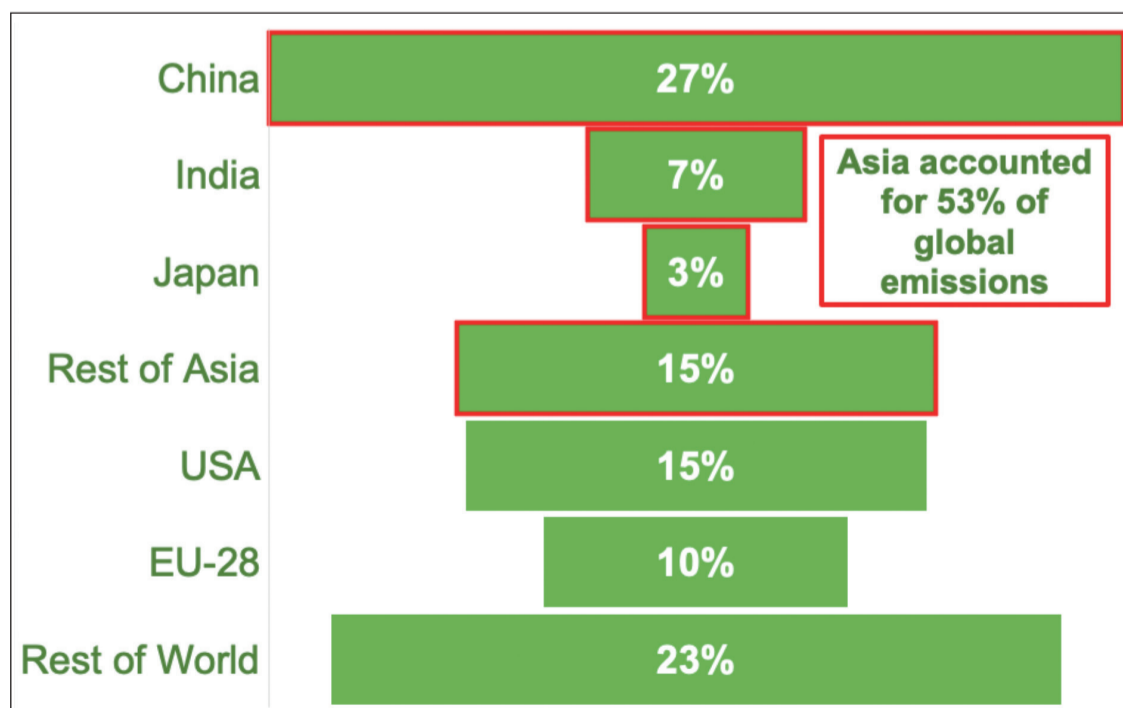
It is vital for Asia to take serious climate action given it accounts for 53 per cent of global emissions and almost half of global energy consumption. Having the commitment of individual governments is only the foundation. It does not really matter if the policies are weak or strong, as long as government commitment is clear. What is crucial, is to get corporates on board. Mandating CFD is a huge incentive for them to think about climate action.

At the same time, corporates, including those in the energy sector, must have clear and achievable transition plans. This is absolutely imperative for both their survival and their growth. For survival, because if an energy corporation has not clearly and realistically assessed climate-related risk, their business may be considerably negatively impacted. Also, they will find it harder to raise money from public markets or borrowing. Having a plan, will allow them to be well prepared for the new market landscape and give them an opportunity to thrive. The companies that will succeed are those that are fully prepared for a net zero landscape.

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Global CO₂ emissions in 2017 (see source for further details)

Source: Author using data from: Hannah Ritchie, Max Roser and Pablo Rosado (2020) – 'CO₂ and Greenhouse Gas Emissions'. Published online at [OurWorldInData.org](https://ourworldindata.org). Retrieved from: <https://ourworldindata.org/co2-and-greenhouse-gas-emissions> [Online Resource]



Getting smart about transforming the network



The project makes use of eight smart transformer devices

Grella says Stratus is one of a number of cutting-edge projects at the forefront of electricity innovation

It's 6pm on a cold winter's night and three million electric vehicles are plugged in and charging for the evening, their motors still warm. In hundreds of thousands of homes heat pumps are keeping people cosy. The demand for electricity has never been higher and a traditional electricity network would struggle to cope. This is the new normal in the year 2030.

With the number of car drivers expected to go electric at an unprecedented rate and homeowners continuing to move away from carbon intensive heating solutions, it's easy to see how the transition to net zero will place added pressure on the electricity network. In the UK, to date, UK Power Networks has seen approximately 400 000 low-carbon technologies connect to the network. With the modern customer making more conscious decisions around their fossil fuel consumption and environmental footprint, we expect to see this rapid uptake continue long into the future.

The complex challenges brought on by this revolution in low carbon technologies (LCTs) require a more active network management approach. Upgrading the existing infrastructure of a network that covers over 20 million people would represent a significant cost to customers, which is why UK Power Networks sought a more novel approach.

Project Stratus is a world-first smart transformer trial that is set to provide unparalleled network insights to help maintain reliable power supplies in the south of England.

The innovative trial will see eight smart electricity transformers installed in streets across East Sussex which, if successful, will provide live data on electricity usage and demand, on a scale never before achieved. This will help the company increase network resilience and enable a step-change in the journey towards a low carbon future.

The project will make use of a new 'smart Tx' device developed by our partner in this project. Using newly-developed power electronic technologies for the first time on a live network, it is an autonomous network device that analyses and responds to issues it observes in its vicinity.

Imagine it as installing a set of intelligent brains across the workhorse of the UK Power Networks asset base, analysing data and constantly making adjustments. Designed as a

The transition to net zero will place added pressure on the electricity network. The Stratus project is a "world-first" smart transformer trial that is set to provide unparalleled network insights to help maintain reliable power supplies as the UK transitions to a low carbon future. UK Power Networks' Luca Grella, explains.

drop-in replacement for a conventional distribution transformer, it can be deployed within existing substations and pole-mounted locations with no change in the existing footprint.

Initially, Stratus will analyse how the transformers operate as stand-alone units over a period of six months, testing the functionality exclusively in their local area. Following that, the project will look to understand how the units can operate in unison across the network.

In a world of electric vehicles and decarbonised heating, this enhanced visibility and control of our network will allow us to efficiently manage the existing network infrastructure, which was never designed for this increased load.

Whether it is by redirecting power flows, or by managing energy capacity, smart transformer technology would give the network operators world-class oversight and flexibility long into the future, allowing for the integration of more low-carbon technologies as efficiently as possible.

The project represents just one of the innovative ways UK Power Networks is improving network reliability, helping to keep the lights on for over 20 million people. With world-leading visibility of the low voltage network, this new device provides the ability to react to potential network faults before they develop and affect the local power supply.

With greater visibility of what is happening on the low voltage network, UK Power Networks will also be able to release more energy on the network during times of peak electricity demand.

Electricity, like a car exiting from a motorway, needs to be slowed before it can safely enter the local network. Traditional transformers have played the role of 'road speed' sign across the network for the better part of a century, slowing traffic to get it safely into our homes. Whilst homes of the past maintained stable and predictable electricity demand, the rise of in-home LCTs require an increased level of visibility of exactly what's happening on the local network.

Stratus imagines a future where the role of the transformer is no longer to simply slow the flow of traffic along this energy highway, but to help manage and redirect the flow to ensure everyone gets the electricity they need, as efficiently as possible and without affecting the rest of the network.

The ability to balance power across the network will maximise the existing electricity network infrastructure, drastically reducing the need to spend customer money on installing new cables and wires in the ground. Across a network that spans over 189 000 km including both underground and above ground cables, this will be essential in keeping costs down during uncertain times.

Increased visibility of the low-

voltage network will allow renewable generators such as wind and solar to pass electricity back from suburban homes and onto that high-speed electricity highway. Stratus' optimisation algorithm can then send renewable electricity to where it may be needed, soaking up excess supply when it exceeds demand or charging energy storage devices outside of peak times to free up capacity, seamlessly meeting the changing needs of customers. For the first time in the UK, this highway will become multi-directional.

The introduction of the technology could then enable future markets to support the network and could provide a reliable power source for the next generation of emergency service vehicles. With more fleets than ever looking to head electric, increased network flexibility will help proactively address the challenge of large-scale EV charging.

UK Power Networks has recently concluded the world's largest electric fleet trial through its groundbreaking Optimise Prime project. Together, alongside a variety of industry bodies such as Uber and Royal Mail, the project has sown the seeds of large-scale EV adoption in fleets throughout the United Kingdom.

Similarly, additional flexibility options across the network will minimise the impact of low carbon heating solutions such as heat pumps. With more network visibility comes more security and customers can feel more confident than ever to adopt LCTs without affecting their power supply.

The smart new device is also estimated to reduce network losses by up to five per cent, which could also save up to £3.8 million (\$4.64 million) in savings across the network. If successful, as many as ten smart transformers could be installed each year following the completion of the trial.

Our project partner is offering customers up to £90 to participate. By installing smart plugs in 150 customer homes, we can then capture data to better understand the benefits and create a road map for how the technology could be rolled out nationally.

The decarbonisation of transport and energy in the UK will play a major role in facilitating the transition to net zero. Together they account for over 40 per cent of total carbon emissions.

Stratus is one of a number of cutting-edge projects at the forefront of electricity innovation. The decarbonisation of these key industries won't rely on a single game-changing project, but a suite of smart solutions working in unison. The proposed benefits of Stratus would further facilitate innovation across the energy, heating and transport sectors to help meet these net zero targets in the short term and beyond.

Luca Grella is Innovation Programme Delivery Manager at UK Power Networks.





Junior Isles

Navigating fire and ice

Another alarming report from the Intergovernmental Panel on Climate Change (IPCC) has come as the EU put forward its proposals on how it plans to fix flaws in an electricity market exposed by record-high energy prices. The latest findings reinforce that although energy security and affordability are the fires that Europe needs to be put out today, the fires caused by climate change must not be put on the back-burner.

In its Synthesis Report launched in mid-late March – the final instalment of the IPCC’s sixth assessment cycle (AR6) – the IPCC draws together six landmark scientific assessments published since 2018. While it essentially offers nothing new, it serves to again underscore the urgent need to ramp up climate action. And with the next report not due until 2030, it is effectively the last IPCC report while it is still feasible for governments to limit warming to the 1.5°C threshold agreed by governments in the 2015 Paris accord. This is the temperature rise at which scientists say irreversible tipping points occur in nature.

To stay within the limit, greenhouse gas emissions would need to peak before 2025, the report said. Further, it stressed greenhouse gas emissions would need to fall by 60 per cent by 2035. Previous IPCC reports have said carbon emissions must fall by almost half by 2030 for the world to have any hope of limiting global warming to 1.5°C but governments’ national emissions reduction plans are already falling short. Current commitments put the world on course for warming of about 2.8°C by 2100.

Launching the report, UN Secretary-General, António Guterres said: “Humanity is on thin ice – and that ice is melting fast,” also noting that the rate of temperature rise in the last half of the century is the highest in 2000 years. But no doubt keen to push politicians, business leaders and all stakeholders to greater action, his message was: it is still not too late.

Guterres called the IPCC report “a survival guide for humanity” and a “how-to guide to defuse the climate time-bomb”. He said the report shows the 1.5°C limit “is achievable” but

“will take a quantum leap in climate action”.

The report certainly confirms what we are already seeing – with Cyclone Freddy in Malawi, Mozambique and Madagascar and flash floods in Türkiye – that climate change is here and now.

Yet in a show of positivity, scientists maintain the solutions are there to avoid catastrophe, citing renewable energy and electric vehicles, as well as regulatory changes, such as new carbon taxes and the removal of fossil fuel subsidies.

In truth, technology has never really been the issue; the main obstacle has long been political and economic will.

Commenting on the report, John Morton, Managing Director, Global Head of Advisory at Pollination, said: “In the past few months, we’ve seen rising economic competition between nations on transition pathways. From a climate perspective, this is a good thing as it will drive a race to the top and catalyse the development of new technologies and innovations. This competition is commendable... However, it also runs the risk of adding noise and geopolitical tension to what will already be a bumpy transition journey. To succeed, we need to tamp down these tensions, and build alliances between the private and public sectors in support of a global push to achieve net zero by mid-century.”

Just before the report was published the European Commission put forward its proposals for reforming the electricity market. Although prompted by the surge in energy costs, which exposed the shortcomings of the link between gas and electricity prices, the need to reform also presented an opportunity to accelerate the energy transition. The EU needs to triple its deployment of renewables before 2030 if it is to hit its climate targets.

The Commission stated in a press release: “The EU has had an efficient, well-integrated electricity market for over 20 years, allowing consumers to reap the economic benefits of a single energy market, ensuring security of supply and stimulating the decarbonisation process. The energy crisis spurred by Russia’s invasion of Ukraine has underlined the need to quickly adapt the electricity market to better support the green transition and offer energy consumers, both households and businesses, widespread access to affordable renewable and non-fossil electricity.”

Building a renewables-based energy system, it said, will not only be crucial to lower consumer bills, but also to ensure a sustainable and independent energy supply to the EU, in line with the European Green Deal and the REPowerEU Plan.

A key part of the proposed reform is the greater use of stable long-term Power Purchase Agreements (PPAs) and Contracts-for-Difference (CfDs) to enhance the competitiveness of EU industry and to reduce its exposure to the volatile prices seen in the last year.

There will also be new obligations to facilitate renewables integration into the system and enhance predictability for generation. These include transparency obligations for system operators as regards grid congestion, and trading deadlines closer to real-time.

The proposal is seen as a much-needed response to the varying approaches that were being taken by individual countries to the energy crisis.

During a recent webinar organised by *Energy Post* on behalf of Polish electricity company PGE Polska, Leonardo Meuss, Director of the Florence School of Regulation, noted that national measures were causing “chaos” and there was need for “harmonisation”. The Commission’s proposal attempts to provide that but in a way that does not completely overhaul a system that has been in place for more than two decades.

Not all are convinced it goes far enough or fast enough, but it has been welcomed by some. In a joint letter, published in February, Germany, Denmark, Estonia, Finland, Luxembourg, Latvia and the Netherlands called for a cautious approach that preserves the current market setup. They urged the Commission to keep the reform “targeted” and focused on measures that will enable the green transition while ensuring affordable energy for consumers.

A number of Europe’s largest utilities, including Enel, RWE and Vattenfall also urged caution, advising Brussels to focus on reforms that will drive massive investment in renewable energy, low-carbon generation and energy savings.

Kristian Ruby, Secretary General of Eurelectric, the association representing the European electricity industry, welcomed the proposal. “Long-term instruments are the key element in this reform as they provide benefits for both customers and investors,” he said. “Access to fixed-price offerings allow customers to limit their exposure to extreme price volatility. At the same time, long-term signals will give investors better visibility on their cash flows. But the devil is in the detail because there are a whole range of different long-term arrangements... it’s about finding the right balance between these different tools and finding the right balance between state and market in the energy transition.”

The proposed reform will now have to be discussed and agreed by the European Parliament and the Council before entering into force. This is expected to take up to one year.

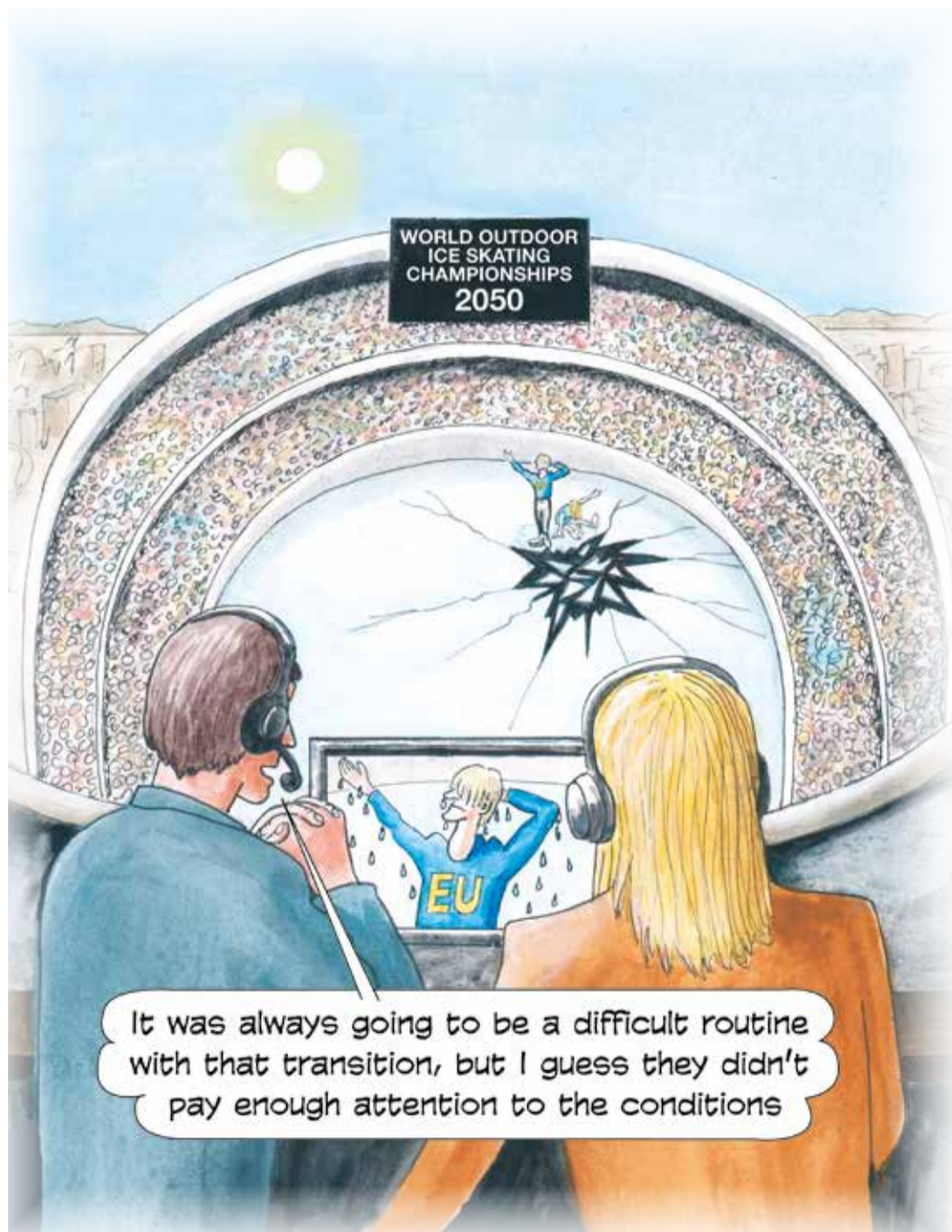
“We would certainly hope that the co-legislators would come to an agreement rapidly, ideally before next winter” so that the measures are already in place for the next heating season, said a Commission official. This could put EU countries at odds, with France pushing for a swift review and Germany preferring to delay the overhaul until after the European elections in Spring 2024.

Member states will now debate the Commission’s plan to realign the plethora of national strategies that have been put in place to predominantly ensure energy security and affordability. But during the coming months of negotiations, countries would do well to keep the IPCC report in mind.

Speaking during the webinar, Jérôme Le Page, Chairman of the Electricity Committee at the European Federation of Energy Traders, said: “Security of supply and affordability are important but the main fight for decades to come is climate change and we need to keep that in mind.”

As Morton put it: “One thing is certain. When we arrive in 2050, we will all wish we had gone faster.”

We must all remember it is still critical to navigate the thin ice of climate change even when the fire of affordability and security is at your back.



It was always going to be a difficult routine with that transition, but I guess they didn't pay enough attention to the conditions