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Turn up the heat

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Heat records smashed despite clean energy limiting rise in global emissions

Saulo: the WMO "is sounding the red alert" to the world

According to a recent UN report, global temperatures reached an all-time high last year, despite the rapid rise in clean energy sources. **Junior Isles**

Global temperature records were smashed in 2023, despite a rise in clean energy limiting the rise of carbon dioxide emissions.

In yet another warning that global temperature rises were reaching dangerous limits, last month the UN's World Meteorological Organization (WMO) sounded a "red alert" on climate change.

Using data from member countries and partner agencies, the WMO report confirmed that 2023 was the hottest year on record. The average global surface temperature was 1.45°C above pre-industrial levels, it concluded, with a margin of uncertainty of 0.12°C.

The world was "so close – albeit on a temporary basis at the moment" to breaching the 1.5°C lower limit of the Paris Agreement, said WMO Secretary-general Celeste Saulo, that "the WMO community is sounding the red alert to the world".

The 1.5°C threshold refers to the measure of long-term average temperatures reached over more than a decade, with the world presently on a trajectory for as much as 2.9°C by 2030, according to UN scientists.

The warning came despite a report from the International Energy Agency that said long-term energy-related emissions were in "a structural slowdown" thanks to the growth of clean energy sources such as wind turbines and solar panels. Overall, emissions growth over the past five years would have been about three times higher without the development of cleaner energy technologies, the IEA said.

Emissions increased by 410 million tonnes, or 1.1 per cent, in 2023 – compared with a rise of 490 million tonnes the year before – taking them to a record level of 37.4 billion tonnes. An exceptional shortfall in hydropower due to extreme droughts – in China, the United States and several other economies – resulted in over 40 per cent of the rise in emissions in 2023, as countries turned largely to fossil fuel alternatives to plug the gap. Had it not been for the unusually low hydropower output, global CO_2 emissions from electricity generation would have declined last year, making the overall rise in energy-related emissions significantly smaller.

The new findings come from the IEA's annual update on global energy-related CO_2 emissions – and the inaugural edition of a new series, the 'Clean Energy Market Monitor', which provides timely tracking of

Continued on Page 2

Finance is key to meeting COP28 renewables targets

The International Renewable Energy Agency (Irena) released a new report on the sidelines of the Berlin Energy Transition Dialogue last month describing the actions needed if the world is to meet targets set at the recent COP28 climate conference in December and the level of finance needed.

Irena President Francesco La Camera said renewables are the only energy sources that can be deployed with the speed and scale to achieve the ambitious targets set at the Dubai climate conference.

"We need to deploy around 1.1 TW of renewable energy capacity per year by 2030. Every technology that provides a reduction in CO_2 emissions is good, but technology neutrality may not be the solution, as only renewables ensure the necessary speed and scale to achieve the proposed targets," said La Camera, in reference to the slow pace at which nuclear energy is currently driving the global energy transition.

According to the official documents, 123 national governments and supranational blocs, including the European Union, have signed up to triple the world's installed renewable energy generation capacity to at least 11 TW by 2030. The signatories also vowed to double the global average annual rate of energy efficiency improvements, from 2 per cent to 4 per cent, until the end of 2030.

In the 'Tracking COP28 Outcomes' report, Irena said that annual investments in renewable power generation must surge from $570 billion in 2023 to $1550 billion on average between 2024 and 2030.

The Berlin meeting also saw the Global Renewables Alliance launch the 'Time 4 Action' campaign, calling for action to mobilise $10 trillion in public/private investments and establish policy frameworks paving the way to reach 11 TW of renewables by the end of this decade.

"There is no energy transition without action," said Bruce Douglas, CEO of the Global Renewables Alliance. "World leaders have committed to the tripling goal and now it's time to deliver. This means taking urgent action on finance, permits, supply chains and grids."

The alliance said scaling renewables by three times globally now means taking collective action.

Yet appetite for collective action seems to be waning. Speaking at a recent two-day ministerial meeting in Copenhagen, Simon Stiell Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCC), said its climate change arm faces "severe financial challenges" that could leave the organiser of the annual global COP summit struggling to help governments tackle global warming.

The UNFCCC, which oversees the co-ordination of global efforts on climate issues, said its budget was less than half funded. It said it needs €74 million over 2024 and 2025 for its so-called core budget, which is funded by national government contributions and was agreed at last year's COP28 summit.

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clean energy deployment for a select group of technologies and outlines the implications for global energy markets more broadly.

"The clean energy transition has undergone a series of stress tests in the last five years – and it has demonstrated its resilience," said IEA Executive Director Fatih Birol. "A pandemic, an energy crisis and geopolitical instability all had the potential to derail efforts to build cleaner and more secure energy systems. Instead, we've seen the opposite in many economies. The clean energy transition is continuing apace and reining in emissions – even with global energy demand growing more strongly in 2023 than in 2022. The commitments made by nearly 200 countries at COP28 in Dubai in December show what the world needs to do to put emissions on a downward trajectory.

"Most importantly, we need far greater efforts to enable emerging and developing economies to ramp up clean energy investment."

The WMO report also said that the rise in clean energy sources offered a "glimmer of hope" after renewable power capacity additions rose by 510 GW in 2023, almost 50 per cent from the previous year.

Although impressive, the International Renewable Energy Agency (Irena) recently cautioned that a target set at the UN's COP28 climate summit to triple renewable power capacity by 2030 would only be possible with a "major global course correction".

An average of almost 1100 GW of renewables capacity must be installed annually by 2030 to meet the target – more than double the record set in 2023, Irena said.

In late February a report by Wood Mackenzie said the European Union would not meet its climate targets until well into the 2060s, as focus shifts to energy security and economic stability.

On its current trajectory, the EU's emissions are expected to fall short of its net zero pledges at 684 million tonnes per annum (Mtpa) by 2050, despite unity between members to meet the EU 2050 net zero target, which falls under the European Green Deal.

Under its net zero 2050 scenario, the 'EU27: Energy Transition Outlook' finds that to meet global net zero goals, the EU would need to reach net zero by 2048 in order to offset other regions that will still be emitting throughout the following decade.

Entwistle says a turbulent start to the decade has "thrown up several obstacles"

"The EU remains a leader in the energy transition with ambitious, legally binding targets, but a turbulent start to the decade has thrown up several obstacles, shifting focus to energy security and economic stability, while pushing net zero targets lower on the agenda," said Lindsey Entwistle, senior research analyst at Wood Mackenzie, and lead author of the report.

European coal-to-gas fuel switching set to continue as gas prices plummet

- Gas prices have plummeted but coal has not seen same large drop
- Gas fired power generation up 32 per cent in Poland

Junior Isles

The fall in European wholesale gas prices to levels seen before the Ukraine war, and greater use of renewable energy is encouraging more electricity utilities to switch from coal to gas, pushing coal further out of the power mix.

European gas prices sky-rocketed in 2022 and early 2023 in the wake of Russia's invasion of Ukraine, prompting many utilities to switch back to relatively cheaper but more polluting coal, even as the region tries to phase it out to meet climate targets.

While EU carbon permit prices have receded from record highs of over €100 in early 2023, they would need to fall further to €47/tonne or lower for even high-efficiency coal plants to be able to replace low-efficiency gas plants in the first quarter of 2024, said Veyt analyst Marcus Ferdinand. Benchmark EU carbon prices currently trade at around €61/tonne.

Although gas prices have plummeted since their highs in 2022, coal has not seen the same large drop.

Fabian Skarboe Roenningen, Vice President of renewables and power at consultancy Rystad Energy, said: "There has been quite a lot of coal-to-gas switching in recent months. We saw clear evidence of a large shift in coal-to-gas switching in 2023, which has continued into 2024."

Roenningen said he expected more coal-to-gas switching this year in countries that have both coal and gas capacity, such as Germany, Poland and the Netherlands, as well as nations with a lot of coal production, but also transmission capacity to import gas, such as the Czech Republic, Greece, Romania and Bulgaria.

Gas fired power generation in Poland was up 32 per cent year-on-year in the first two months of 2024, while hard coal and lignite use fell 15 per cent and 10 per cent, respectively, over that period, according to estimates by Forum Energii.

In Germany, the operating margins of both coal and gas fired power plants are deeply negative, leaving them operating mostly in peak hours when prices are higher, ICIS analyst Stefan Konstantinov said.

Meanwhile, a new report by Wood Mackenzie claimed that gas prices in Europe could fall as low as $6.70 per million British thermal units (mmbtu) in the summer as the mild winter will see gas storage levels remain above 55 per cent.

The report, 'Europe gas and power markets short-term outlook Q1 2024', states that the mild European winter, the second in succession, means that European storage levels will reach 89 per cent by the end of July 2024, putting further pressure on prices. It noted, however, that European prices are set to increase in 2025.

In separate research, the World Bank (WB) said gas can play a vital role in the efforts to reduce carbon emissions in Europe and Central Asia. The WB report said gas can contribute by replacing coal, reducing wasteful energy use, mitigating lifecycle greenhouse gas emissions, and integrating with carbon capture, utilisation, and storage, especially in power generation and blue hydrogen production.

It said gas will persist in being utilised for balancing purposes in power, and as a feedstock in the industry well into 2060 and beyond – even in the midst of a transition towards achieving net zero emissions.

China leads global wind surge

The International Energy Agency (IEA) has reported a significant surge in global wind capacity additions in 2023, jumping nearly 60 per cent and surpassing the previous record set in 2020.

Onshore wind projects spearheaded the growth, constituting over 85 per cent of the global wind expansion. China emerged as the frontrunner, contributing to more than 60 per cent of the global wind expansion, nearly doubling its additions compared to 2022.

The EU experienced a modest increase of less than 10 per cent in wind additions, primarily due to a slowdown in onshore wind deployment. Developers in Europe faced various challenges, including escalating equipment costs, inflation, and supply chain bottlenecks, dampening their enthusiasm to participate in competitive auctions.

In contrast, the US witnessed a decline of over a quarter in wind additions in 2023 compared to the previous year, attributed mainly to uncertainty surrounding the extension of tax credits prior to the adoption of the Inflation Reduction Act (IRA). However, wind capacity additions are anticipated to rebound significantly in the coming years, driven by the long-term policy clarity provided by the IRA.

Wind energy was on the agenda as a strategic global industry at a meeting of G20 Finance Ministers in São Paulo, Brazil at the end of February. Commenting just ahead of the meeting, the Global Wind Energy Council said: "A sustainable future powered by wind is within reach, but it will need to see trillions of dollars rerouted away from fossil fuels, towards to large-scale renewable energy projects in the Global South. This means getting the cost of capital of these projects down.

"G20 Finance Ministers, multilateral development banks and central bank governors must deploy targeted donor finance to the Global South to de-risk wind and renewable energy projects and mobilise huge volumes of private capital to ensure the emerging economies in the Global South are not left behind."

It said that of the $1.3 trillion deployed in 2022, around 85 per cent of global renewable energy investment benefitted less than 50 per cent of the world's population and Sub-Saharan Africa received less than 1 per cent of the global total in the past two years.

Green targets will not be met without grid investment

Outdated and inadequate power grids are one of the most significant stumbling blocks for the energy transition, according to recent research by Rystad Energy.

The Norwegian research and business intelligence firm estimated that $3.1 trillion is required for such infrastructure before 2030 to hold global warming to 1.8°C, with global grid investments predicted to reach $374 billion this year alone.

Notably, Rystad Energy took 1.8°C as a reference point instead of the 1.5°C ceiling indicated in the 2015 Paris Agreement, pointing out that the goal "seems to have been too ambitious, and global efforts in the meantime to eliminate net greenhouse gas emissions were insufficient".

It warned that an additional 18 million km of power grid network would be needed to keep pace with the electrification underway across cities and counties, including new renewable energy capacity and the rapid adoption of electric vehicles.

The International Energy Agency earlier estimated the length at 166.4 million km for 2050, but for the 1.5°C objective.

Speaking to the *FT* on the sidelines of a ministerial meeting last month, Eamon Ryan, Ireland's Climate and Energy Minister said: "There's no transition without transmission. You know it's kind of cliché but it's true."

Electricity consumption in the EU is expected to increase roughly 60 per cent between now and 2030, according to European Commission figures, driven by the bloc's decarbonisation targets.

But with permitting and construction taking anywhere between five and 15 years – more than twice as long as renewables construction – grids are far from ready.

In an 'Action Plan for Grids' published in November, the European Commission pointed to a number of issues that need to be addressed: faster permitting timelines, strengthening supply chains for components such as cables and finding €584 billion in investments to pay for it.

Europe is fast-tracking the development of international offshore transmission hubs that will create a clearer wind deployment outlook, if funding can be found.

The Commission recently identified 12 offshore grid projects as 'Projects of Common Interest' (PCIs). The categorisation will allow them to bid for EU funding this year and gain faster permit approvals. The Commission wants to double cross-border power capacity in the EU by 2030, adding 87 GW of onshore and offshore lines in just seven years.

Finding the investments required for offshore wind grids will be a huge task. ENTSOE-E estimates investments of around €400 billion ($434.0 billion) are required to "optimally integrate" offshore renewable energy facilities by 2050, according to its Ten Year Network Development Plan (TYNDP). This is based on 383 GW of capacity in EU 27 countries plus 15 GW in Norway and 97 GW in the UK. Huge amounts of investments are also needed for onshore grids.

Private and public funding will be required for PCI projects and one of the main challenges will be accurately allocating the cost and benefits between the affected stakeholders, since benefits can be unevenly spread, a spokesperson for Elia Group, the Belgian transmission operator, said.

Rising costs could also be a problem given the limited number of funding options for these types of infrastructure projects, the spokesperson said.

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US EPA backtracks on plans to cut emissions from power plants

- Existing gas plants excluded from planned regulation
- Tougher proposals promised in due course

Janet Wood

The US Environmental Protection Agency (EPA) has unexpectedly decided to exclude existing gas plants from new rules over carbon dioxide emissions.

The decision is a reversal of a Biden Administration announcement, late in the rulemaking process, that the existing plants would be included. The proposal would have required large gas fired power plants, which account for more than 40 per cent of US power sector emissions, to install carbon capture equipment by 2035, or co-fire with 30 per cent hydrogen by 2032. The power industry called the proposal unworkable.

The standards would not have taken effect until after 2030, so the existing gas plant rule would have made little contribution to near-term targets. But Ben King, an associate director with Rhodium Group's energy and climate practice, said it was important in the longer term.

The EPA has said it plans to write a separate rule to cover CO_2 emissions from existing gas plants as well as other hazardous air pollutants, after it finalises the rest of the regulation.

A new rulemaking is likely to take over a year and now may be delayed until after a general election in November. The expectation is that a Donald Trump presidency would see the proposal abandoned.

Industry groups as well as some environmentalists had argued that the proposals for existing gas plants could backfire, leading utilities to use smaller, dirtier plants that fall outside the regulation.

An EPA spokesperson agreed that the 2023 proposal for existing gas fired power plants focused only on large baseload plants and considered only "a limited range of technology options". The spokesperson also said it initially only included separate analyses of "available technical information at the time to support different parts of the proposal".

It said that a rule for existing power plants would also include more pollutants. "As EPA works towards final standards to cut climate pollution from existing coal and new gas fired power plants later this spring, the agency is taking a new, comprehensive approach to cover the entire fleet of natural gas fired turbines, as well as cover more pollutants," EPA Administrator Michael Regan said.

Frank Sturges, a lawyer for the Clean Air Task Force, commented: "We are extremely disappointed in EPA's decision to delay finalising carbon pollution standards for existing gas plants, which make up a significant portion of carbon emissions in the power sector."

But some environmentalists said the new plan would ultimately deliver better results. Charles Harper of Evergreen Action said: "We are glad that EPA is committed to finishing the job with a new rule that covers every gas plant operating in the US."

TerraPower to start work at planned reactor site in Wyoming

TerraPower has announced plans to start building its first Natrium-branded small nuclear reactor at a site in Kemmerer, Wyoming. The reactor, developed in partnership with GE Hitachi Nuclear Energy, has a capacity of 345 MWe.

TerraPower, which has raised almost $1 billion in private funding, has secured pledges from the US government to provide up to $2 billion to complete work at its first plant. It also recently signed an agreement with Emirates Nuclear Energy Corporation to explore using Natrium reactors in the United Arab Emirates.

The company, founded by Bill Gates, said it will apply for a construction permit from US regulators.

Chief Executive Chris Levesque claimed Natrium reactors could be built for about half the cost of standard water-cooled reactors, because "when you use liquid sodium as a coolant instead of water it's a game-changer".

He said non-nuclear construction work would begin in June, regardless of whether the company received a permit from the Nuclear Regulatory Commission by that date and the company plans to bring the plant online in 2030.

TerraPower and its utility partner PacifiCorp – a unit of Warren Buffett's Berkshire Hathaway – said in October 2022 that they would study the feasibility of deploying another five Natrium reactors by 2035.

Chile solar farms prompt battery investment

Chile is set to start up its largest solar PV plant in San Antonio, 90 km from the capital Santiago de Chile. The 95.2 MW Leyda solar farm has an area of 120 Ha and is being built by Czech company Solek.

The company's founder, Zdeněk Sobotka, said: "Chile takes renewable energy seriously; it has great ambitions in this area, thanks to which we are able to build large projects there. Leyda is our biggest investment to date."

The plant will generate 185 GWh annually, which will be sold through a 15-year power purchase agreement (PPA) with Enel Generación Chile.

Chile will also be the home of one of the largest battery projects in Latin America, a 200 MW/800 MWh installation next to Atlas' Sol del Desierto solar plant, located in the commune of Maria Elena in the Antofagasta region. The project is being developed by Atlas Renewable Energy, which recently signed a 15-year PPA with the Chilean company COPEC, through its energy commercialiser EMOAC for 15 years.

"The BESS del Desierto project is a key part of our strategy to enhance energy reliability in the region through advanced solar resource utilisation and offer customised energy solutions to our clients," said Carlos Barrera, CEO of Atlas Renewable Energy.

Mexican wind energy warning as Iberdrola prepares to invest

- Pressure group calls for faster permitting
- State set to link to national grid

Janet Wood

Investment in 5 GW of wind energy projects, with investment of more than $5 billion, are at a standstill in Mexico, according to Gerardo Pérez Guerra, President of the Mexican Wind Energy Association (Amdee), because of slow permitting.

"Investment, at least in large-scale projects, is at a standstill at the moment because nothing has been done," said Perez Guerra. He said seven projects, totalling 800 MW, are already fully built and waiting for sign-off to operate. Héctor Treviño, Executive Director of Amdee, said the wind projects are also facing lack of capacity in electric grids.

The warning came as Iberdrola announced plans to invest in new renewable generation in Mexico. It will use part of the $6.2 billion paid for the sale of 55 per cent of its business in the country. It recently completed the sale of gas fired power plants totalling 8.5 GW to Mexico Infrastructure Partners (MIP) fund, in a transaction that had the backing of President Andrés Manuel López Obrador.

As part of the agreement, Iberdrola has signed power purchase agreements with the trust, led and managed by MIP, as well as a contract for the provision of transitional services for the temporary management of the assets sold.

Iberdrola will retain 15 plants, all of its private customers and its portfolio of renewable energy projects and pipeline to continue increasing its wind and solar assets in the country in the coming years.

Iberdrola Mexico has several renewable projects in its portfolio, mostly wind and solar farms in the state of Puebla. It claims a pipeline of more than 6000 MW of renewable projects in the country, of which it says more than 2000 MW could be developed in the next five years.

"We currently have some 600 MW installed in Puebla, but we also have a portfolio of projects of more than 800 MW in different parts of the state, to which the company will allocate part of the capital obtained from the sale of the 13 plants," said Enrique Alba, Chief Executive of Iberdrola Mexico.

Meanwhile CFE has announced new plans to connect the state of Baja California to Mexico's national power grid for the first time. It will also invest $1.3 billion in building five power plants in Mexicali, near the US border, which will be able to share their production with the rest of the country via the new line.

The connection will be between Mexicali and the 21.56 MW Hermosillo PV plant in the adjoining state of Sonora. CFE Director Manuel Bartlett said: "Mexicali will become a very important centre of electricity distribution."

New debt restructuring plan submitted for Puerto Rico's power company

A proposed new debt restructuring plan for Puerto Rico's power company is under discussion. It comes nearly seven years after Puerto Rico's government filed for the biggest bankruptcy in US municipal history after announcing it was unable to pay a $73 billion debt. Previous debt-restructuring plans have been scrapped.

Protesters complained that power prices would increase again if the plan is approved.

"Every dollar we pay bondholders is a dollar that is not available for the energetic transformation that Puerto Rico urgently needs," said Juan Rosario, who previously represented consumers on the power company's board.

The Caribbean island of 3.2 million people continues to have power outages more than six years after its grid suffered widescale damage in Hurricane Maria, but officials also blame aging infrastructure and lack of maintenance. The country largely relies on 17 temporary generators from the US federal government with 350 MW total capacity.

The Puerto Rico Energy Bureau recently allowed the Puerto Rico Electric Power Authority to acquire the generators, supplied by the US Federal Emergency Management Agency, despite the debt restructuring programme. If the purchase and sale is completed as planned, the generators will remain in operation until the end of 2025.

Renewables costs in Asia Pacific hit all-time low

- Electricity costs from renewables 13 per cent less than coal
- Utility PV is cheapest power source in 11 out of 15 countries

Junior Isles

The levelised cost of electricity (LCOE) generated from renewable sources is declining significantly in the Asia Pacific (APAC) region and reached an all-time low in 2023, according to Wood Mackenzie's latest analysis of LCOE for the Asia Pacific region.

This decline makes renewable energy increasingly competitive with conventional low-cost coal fired power generation, driven by a significant reduction in capital costs for renewable power. The LCOE from renewables in 2023 was found to be 13 per cent cheaper than conventional coal and is expected to be 32 per cent cheaper by 2030.

Alex Whitworth, Vice-President, and Head of Asia Pacific Power Research at Wood Mackenzie stated: "Utility PV [photovoltaic] solar has emerged in 2023 as the cheapest power source in the region, while onshore wind is expected to become cheaper than coal after 2025. Renewables firmed with battery storage is becoming competitive with gas power today but will struggle to compete with coal before 2030."

China is leading the way in lowering the cost of renewables, with utility-scale PV, onshore wind, and offshore wind being 40-70 per cent cheaper compared to other Asia Pacific markets. China will maintain a 50 per cent cost advantage for renewables out to 2050, allowing the country to maintain its lead in renewables deployments, said the report.

"Solar photovoltaic power costs saw a significant decline of 23 per cent in 2023, marking the end of two years of supply chain disruptions and inflation. Utility PV emerged as the cheapest power source in 11 out of 15 countries in the Asia Pacific," said Sooraj Narayan, Senior Research Analyst, APAC Power & Renewables at Wood Mackenzie.

The new-build solar project costs will drop another 20 per cent by 2030, driven by falling module prices and increasing oversupply from China. The decline in solar technology costs in 2023-24 has put pressure on coal and gas, with LCOE for utility PV dropping by an average of 23 per cent across Asia Pacific in 2023, driven by a 29 per cent decline in capital costs.

Wind power costs have seen more modest cost declines. Although onshore wind costs were higher than solar by 38 per cent in 2023, Wood Mackenzie forecasts a 30 per cent drop by 2030 as cheaper Chinese turbines gain market share.

Markets such as Australia and Southeast Asia will benefit from the low-cost import of wind power equipment from China, while Japan and South Korea, with more limited Chinese turbine uptake and focus on local supply chain, will observe onshore wind costs staying above $80/MWh by 2030.

The report also highlights the increasing competitiveness of offshore wind with fossil fuel power in Asia Pacific, with costs falling by 11 per cent in 2023. Offshore wind costs are now on par with coal power in coastal China and are expected to become cheaper than gas power in Japan and the Taiwan region by 2027 and 2028, respectively. Falling capital costs and technology improvements are opening up new markets for offshore wind in India, Southeast Asia, and Australia over the next 5-10 years.

Meanwhile, coal and gas power generation costs have increased by 12 per cent since 2020 and are projected to continue rising through to 2050, primarily driven by carbon pricing mechanisms.

The report also noted that the region faces challenges in the deployment of green hydrogen and ammonia. The cost expectations for these technologies have nearly doubled since last year, making them significantly more expensive than conventional coal and gas power even out to 2050.

Philippines in renewables push

The Philippines' renewable energy ambitions received a major boost last month when ACEN and US-based BrightNight signed a deal to develop 1 GW of renewables.

The partnership with ACEN provides BrightNight additional investment to expand its presence in the rapidly growing Philippines market. BrightNight will also benefit from ACEN's experience, strong domestic presence and established networks.

The deal came as Mainstream Renewable Power, a global pure-play renewable energy company, signed two wind energy service contracts (WESCs) with the Department of Energy (DOE) for the development rights for two onshore wind farms with a combined capacity of 440 MW.

The contracts represent Mainstream's first fully-owned WESCs in the Philippines and it is one of the first 100 per cent foreign-owned companies to secure such contracts.

In a move to balance the growth of renewables, a deal was also struck to invest in new gas fired generation and gas infrastructure.

In March MGen, Aboitiz Power (AP), and SMGP launched what is claimed to be the Philippines first LNG facility in Batangas, aiming to boost energy security and sustainability. The $3.3 billion deal includes investments in power plants and LNG terminals. The collaboration will add 2500 MW of generation capacity, aligning with the Department of Energy's goal to increase the share of natural in the power mix to 26 per cent by 2040.

"Both LNG and renewables are needed to achieve a balanced energy mix and well-planned energy transition. Above all, this is a big win for the Philippines and the people. Economic development is impossible without energy security, and this investment is a definitive step forward in that direction," Sabin M. Aboitiz, AP chairman said.

South Australia accelerates 100 per cent renewables target

The South Australian government says it will aim to reach its 100 per cent renewables target by 2027, rather than by 2030, amid efforts to accelerate decarbonisation.

The government said in a statement: "By setting an even more ambitious target, we are letting the world know that there is no room for complacency in our mission to decarbonise." It also said that the increased share of renewable power generation would help drive down electricity prices.

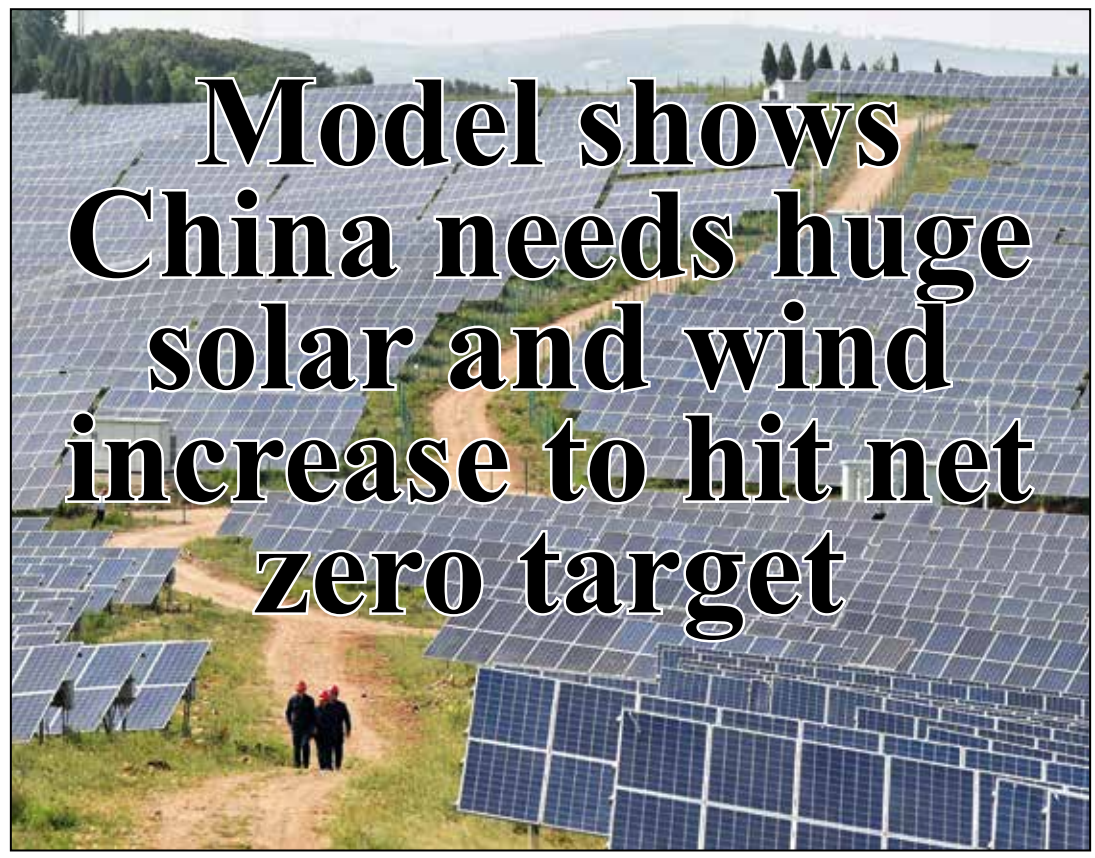
The government's plan calls for storing excess renewable power output in order to "provide a consistent output of supply" and enhance grid stability, while enabling mining, processing, and manufacturing to produce carbon-neutral goods.

It highlighted the synergy between investment and renewables as it referred to mining giant BHP's recent deal to cover half of its Olympic Dam electricity consumption with locally produced wind power.

South Australia is pursuing a goal to cut its net greenhouse gas emissions by at least 50 per cent by 2030 from 2005 levels and reach net zero in all sectors by 2050.

Elsewhere, the federal government has given the thumbs up to the construction of a 1.5 GW wind farm in New South Wales. This will be one of the largest sites of its kind in the country. A final investment decision and the start of construction activities are expected to take place in 2025/2026 and the wind farm's commissioning is due in 2027/2029.

Last month also saw the federal government officially declare the country's third offshore wind development zone. The final designated area is located around 15-20 km off the Victorian coast and covers 1030 km^2 of seabed areas.



Model shows China needs huge solar and wind increase to hit net zero target

China will need nearly 6 TW of solar and wind power – around 10 times more than the country had in 2022 – to achieve its goal of becoming carbon neutral by 2060, according to a new model simulation.

The simulation – a collaboration between scientists at the University of California San Diego and Tsinghua University in Beijing – found that if China is to meet its carbon neutrality goal, it will need to have 2 TW of wind power capacity and 3.9 TW of solar installed.

"The required deployment rates in mid-century are close to what has been reported for 2023, though there will still be challenges to sustain that over time," said Michael Davidson, senior author of the study and a professor at UC San Diego.

The team ran a "highly spatially resolved model" which took into account China's current grid integration, land use, energy storage and government policies. The researchers said the model was created with the expectation that China would continue to "exploit" its existing hydropower resources, and that just over 200 GW of coastal nuclear power would be added.

In 2020, President Xi Jinping announced that China would aim to peak carbon emissions by 2030 and achieve net zero carbon neutrality by 2060, in line with its global climate goals.

The researchers said that to meet this target, China will need "a suite of zero- and negative-emissions generating technologies as well as complementary storage and transmission infrastructure".

In late February, however, new research revealed China approved 114 GW of coal power capacity in 2023, up 10 per cent from a year earlier. The research by US think-tank Global Energy Monitor (GEM) and the Helsinki-based Centre for Research on Energy and Clean Air (CREA) warned that the sanctioning of dozens of new plants puts the country at risk of falling short on its climate targets.

"Drastic action" is now required to meet 2025 carbon and energy intensity goals, and China could also struggle to meet a target to raise the share of non-fossil fuels in its total energy mix to 20 per cent by 2025, the report stated.

CREA has previously forecast that China's carbon emissions will fall this year, with utilisation rates at coal plants likely to drop significantly as more clean energy is connected to the grid.

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THE ENERGY INDUSTRY TIMES

EU moves to address energy trilemma

Plenty to do despite early wrap-up at Geneva climate talks

Wind industry anticipates growth in offshore sector after EU acts

- Supply chain pressures easing
- New connections needed

Janet Wood

A recent compromise between the EU's Council and Parliament on the Net Zero Energy Act means the EU's wind energy target for 2030 of 393 GW "is within reach", according to WindEurope forecasts. The group said the EU will install an average of 29 GW per year between 2024 and 2030.

WindEurope said investments in wind energy in Europe more than doubled in 2023 compared to 2022, with inflationary pressures easing, greater certainty in electricity markets and improved tariff indexation by governments. But the group warned that further expansion relies on speeding up expansion of Europe's onshore and offshore electricity grids.

"The number one bottleneck now is the grid. We need better top-down planning, innovation in financing new grids and better use of the existing grid," said Pierre Tardieu, Chief Policy Officer of WindEurope.

Support included the EU Commission's Wind Power Package in late 2023, which included 15 actions to strengthen the industry. WindEurope said until 2030 two-thirds of new installations will be onshore, but by 2030 offshore wind installations will be rapidly increasing to draw level with new onshore installations.

Key to the growth is network expansion, as announced in the UK and by Germany's Federal Network Agency in a network development plan for five major power lines, plus 35 additional projects in the North and Baltic Seas to connect up to 70 GW of power from offshore wind farms in the period to 2045.

The North Sea is currently the main focus. Mārtiņš Čakste, Chairman of the Board of Latvenergo said projects in the Baltic Sea were being put on hold due to inflation, bank financing and logistical bottlenecks.

He said: "Almost everybody moved to the North Sea, where there is much higher electricity consumption, more serious companies. Denmark's Ørsted, RWE and a few other players decided to leave the Baltic market for a while."

But he said Latvenergo will participate in an upcoming auction because offshore wind will be competitive again in the Baltic in future.

However, projects that connect across the North Sea may be affected by concerns over the EU's Carbon Border Adjustment Mechanism (CBAM), which takes effect in 2026. Analysis by consultants AFRY warned that the CBAM risked driving up the price of electricity traded between the UK and the EU and reducing transfers of green electricity. Rebecca Sedler, Managing Director of National Grid Interconnectors, said the carbon tax could "significantly reduce" exports of British electricity to the EU, which would be "self-defeating".

Netherlands initiates offshore wind tender, as nuclear wins support

The Dutch Ministry of Economic Affairs and Climate, through Netherlands Enterprise Agency, has initiated an offshore wind tender for permits for 2 GW lots in the IJmuiden Ver wind farm zone in the North Sea. A third 2 GW plot is due to follow shortly.

The IJmuiden Ver area is 62 km off the west coast and grid operator TenneT is due to erect three offshore substations linking to the onshore network. The tender was described as "aggressive" by *REGlobal*.

Meanwhile, Dutch company SolarDuck recently announced the start of work on a floating offshore solar farm to be integrated into RWE's 800 MW OranjeWind wind farm, 53 km offshore. The experimental project, led by the Nautical Sunrise consortium, has a budget of €8.4 million, with €6.8 million provided by the Horizon Europe programme.

Onshore, members of the Dutch parliament recently voted in favour of a motion calling on the government to look into building "at least" four new large nuclear power stations. The target would double plans for two nuclear stations set in motion by the outgoing cabinet, which agreed at the end of 2022 to build two plants next to the existing nuclear station in Borssele, Zeeland, to start up in 2035.

The new proposal calls on climate minister Rob Jetten to "work out a scenario which provides for a greater share of nuclear power" in the Netherlands.

Iberdrola pushes ahead on Italian solar as supply chain feels the pressure

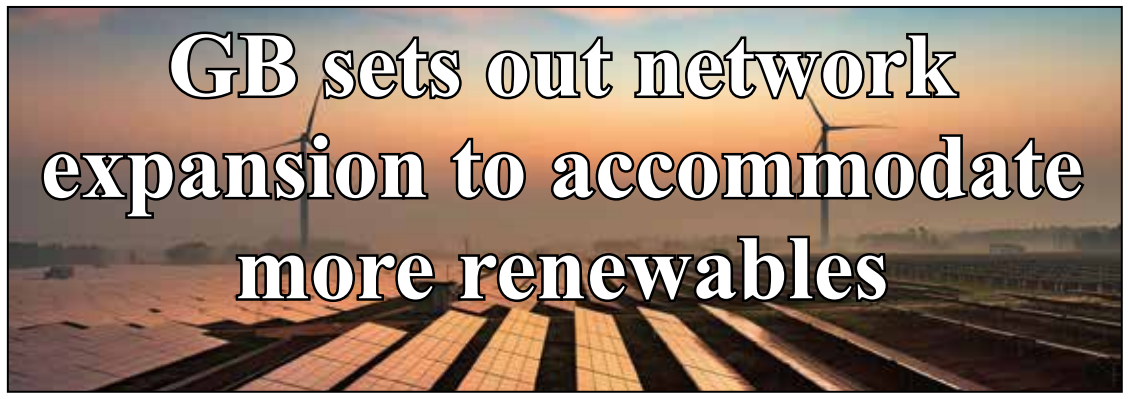
Iberdrola has signed an agreement with IB Vogt for the construction of Italy's largest solar farm, the 245 MW PV project in Sicily, to which a further 60 MW could be added. Iberdrola is also due to start construction this half-year on smaller solar farms Limes 10 (18 MW) and Limes 15 (36 MW) respectively, and three other permitted projects are planned for the second half of the year.

"This is a further step in Iberdrola's growth in Italy," said Valerio Faccenda, Country Manager of Iberdrola Renewables in Italy.

The projects come as the European Commission has come under pressure to support Europe's solar power industry, after eight European solar supply chain companies have either filed for bankruptcy, paused production, warned of factory closures or restructured debts, according to SolarPower Europe.

It noted that Switzerland's Meyer Burger Technology has seen its shares lose nearly 90 per cent of their value in the past year. The company recently announced plans to close a module production site in Germany, while it raised new funding. Solar lobby groups have warned that domestic companies cannot compete with cheap imports from China, which can be produced for half the cost of European-manufactured panels.

However if the EU restricts or places minimum tariffs on Chinese imports it is likely to raise protests from installers.



GB sets out network expansion to accommodate more renewables

- Market arrangements set to move to zonal charging regime
- Capacity Market rules give easier route for new gas plant

Janet Wood

Great Britain's new System Operator has announced that investment of £60 billion is needed in the next decade to expand the power grid.

The announcement came in a report, 'Beyond 2030', from a new government-owned National Energy System Operator (NESO), which from mid-year will have responsibility for integrated planning of gas and electricity networks across GB.

The system operator said that the plan would connect a further 21 GW of offshore wind in development off the coast of Scotland to the grid "in an efficient and coordinated way" and bring the country's total offshore wind capacity to a potential 86 GW.

RenewableUK's Director of Future Electricity Systems Barnaby Wharton said: "Reinforcing and expanding our electricity grid is long overdue." He added: "The measures set out in this ambitious plan put offshore wind at the heart of our future energy system, enabling us to decarbonise our electricity network by 2035 and securing our position as a global leader in this key technology."

Energy UK Chief Executive, Emma Pinchbeck said: "The proposals set out by the electricity system operator capture the necessary level of ambition to get the UK on track for economic growth, job creation, and a more cost-efficient energy system which best uses new technologies and demand from today's customers".

A major focus of the Beyond 2030 proposals – which have still to be finalised after consultation with potentially affected communities – is transporting power from wind farms offshore of Scotland to cities and industries south of the Scotland-England border, where connection capacity has been limited. The system operator recommends expansion of the offshore grid, a new north-to-south onshore 'electrical spine' and eventually several 'bootstrap' offshore links.

Meanwhile, the British government has published proposals in its Review of Electricity Market Arrangements (REMA), intended to address "long-standing inefficiencies of the GB energy market design".

In a major change the government now plans to introduce a locational aspect to the market arrangements, which it hopes will also encourage major power users to choose sites closer to renewable generation, and vice-versa. It rejected proposals for so-called 'nodal' charging set at thousands of grid intersections, instead deciding to take forward plans for zone-based charging.

The government also announced changes to its decade-old Capacity Mechanism to ensure it incentivises development of large gas fired stations, with the ability to capture carbon emissions. It was responding to fears that there would be a supply shortage in the next decade, although it said it expected the gas plants to be used for very short periods.

Britain tops European battery attractiveness list

Britain, Ireland and Italy are the most attractive markets for investors in battery power storage, energy consultancy Aurora Energy said recently. The company forecasts a seven-fold increase in European battery power storage capacity by 2030.

The UK-based consultancy also named Spain, Germany and Greece as promising markets, citing its 'Market Attractiveness Report', which covers 24 European countries.

Ryan Alexander, research lead, European power markets, said battery storage was "moving from being a niche part in the energy system to actually one of the fundamental elements of it".

The comment came as 655 MW of battery capacity won contracts in Britain's year-ahead Capacity Market auction, and the system operator Grid announced it will accelerate 10 GW of battery storage projects.

Among battery projects in the GB pipeline, the world's largest battery storage scheme recently had planning permission granted for a site near Manchester, while E.On acquired one of two 230 MWh/115 MW battery projects under construction at Uskmouth.

The boom has attracted new investors such as Abu Dhabi Future Energy Company PJSC (Masdar), which as Masdar Arlington Energy has broken ground at two battery sites as part of a 3 GWh pipeline of batteries in the UK.

Masdar's Chief Executive, Mohamed Jameel Al Ramahi, said: "To achieve the global energy transition agreed in the UAE Consensus, we need to utilise world-changing renewable energy sources and technology, including wind, solar and battery energy storage."

Nuclear energy enjoys high-level policy boost

- IAEA calls for more international lending
- Summit outlines role of small modular reactors

Nadia Weekes

Several world leaders committed to nuclear energy as a key component of global efforts to reduce greenhouse gas emissions, ensure energy security and enhance resilience at the inaugural Nuclear Energy Summit in Brussels on March 21.

Bringing together the heads of countries operating nuclear power plants – or considering them – and the International Atomic Energy Agency (IAEA), the summit pledged to promote a just and equitable transition away from fossil fuels.

Nuclear energy was recognised at COP28 as an essential component of a clean energy transition, with the US and 21 other countries committing to triple nuclear energy by 2050.

The nuclear summit identified better financing, technological innovation and improved operational performance as the key enabling conditions to support the expansion of nuclear energy. In their final declaration, the summit participants urged nuclear regulators to collaborate on the deployment of advanced reactors, including small modular reactors, as well as on nuclear fuel supply, equipment manufacturing and resource security.

Reiterating the role of the IAEA at the heart of global cooperation in the nuclear field, they called for more public and private investments in additional nuclear power projects.

In particular, they invited multinational development banks, international financial institutions and regional bodies that have the mandate to do so to consider strengthening their support for financing projects.

Rafael Mariano Grossi, Director General of the International Atomic Energy Agency (IAEA), said that multinational lenders such as the World Bank were "out of step" on nuclear energy, having failed to finance the technology in recent decades.

Earlier this year, former Spanish Economy Minister Nadia Calviño, who took over the European Investment Bank (EIB) presidency from Werner Hoyer, told the *FT* that some areas of the bank's policy – including its approach to nuclear power – would differ from her predecessor.

The EIB, which has a balance sheet of more than €500 billion ($540 billion), is not banned from investing in atomic power, but has shunned new nuclear generation projects since 1987.

Calviño said Europe needs to get "active [with] modular reactors", which are operational only in China and Russia. A number of countries including France, the UK and the US are seeking to deploy the new technology.

"Each project is assessed on its own merits, depending on economic and financial viability, environmental viability, and technical viability," said Calviño.

New energy fund to boost transmission across Southern Africa

The Southern African Power Pool (SAPP) and investment advisers Climate Fund Managers have launched a new $1.3 billion target fund to build high voltage transmission lines linking countries in the region.

The Regional Transmission Infrastructure Financing Facility (RTIFF) starts with $20 million in commitments from SAPP. It aims for a first close of $500 million in 2025. Finance will be raised from public and private sector investors locally and internationally.

Despite an abundance of energy sources in Africa, a lack of connections between countries has hampered integration and trade among SAPP's 12 members, which include regional economic heavyweight South Africa and top copper exporter Zambia.

"RTIFF dismantles this by enabling the private sector to work alongside public sector utilities to roll out new transmission lines at scale," said Victor Mapani, Chairperson of the SAPP executive committee.

The facility, with a fund life of between 20 and 25 years, is expected to reach a final close of $1.3 billion within two years.

A renewable energy push has highlighted the dearth of connections across the region where projects, often in remote areas, are unable to connect to national grids.

A competitive electricity market with daily trades, SAPP is aiming to connect Angola, Malawi and Tanzania to the platform and has identified eight priority transmission projects.

"Since Malawi is already being connected to Mozambique and Tanzania is being connected to Zambia, the next key project is the connection of Angola to Namibia," said Stephen Dihwa, Executive Director of SAPP.

The Angola-Namibia interconnector is estimated to cost $356 million – around a tenth of the total investment needed for transmission lines by 2040 to enhance regional integration.

"The lack of investment in grid infrastructure is one of the reasons for ongoing blackouts in many parts of Southern Africa," Amit Mohan, head of private credit at Climate Fund Managers said.

Uzbekistan banks on green projects under 2030 energy strategy

- 1.6 GW of solar and wind power plants planned
- International partners support small hydro projects

Projects for the construction of solar, wind and hydroelectric power plants worth $13 billion are being implemented in various regions of Uzbekistan under plans to exploit the country's huge solar and wind energy potential.

Nine large solar and wind power plants with a combined capacity of 1.6 GW are planned in the regions of Bukhara, Jizzakh, Kashkadarya, Navoi, Samarkand and Surkhandarya regions.

Six large and small hydroelectric power plants with a generating capacity of 183 MW were launched in Andijan, Samarkand, Surkhandarya and Tashkent.

Solar panels with a total capacity of 457 MW have been installed at social facilities, companies and residential buildings, generating an additional 5 billion kWh of electricity and saving 1.5 billion cubic metres of gas.

Approving a state-sponsored programme for the implementation of the Uzbekistan-2030 strategy, President Shavkat Mirziyoyev outlined in February the beginning of construction at six large solar photovoltaic (PV) power plants and the introduction of a green energy certificates market.

The six solar PV plants, with a combined capacity of 2.7 GW, are planned for the strategic regions of Tashkent, Kashkadarya, Bukhara, Namangan and Navoi.

Uzbekistan aims to establish the market circulation of green energy certificates and formalise the procedure for trading carbon credits by April 1. Last year, the country secured a $46.3 million investment from the World Bank to support these initiatives, alongside comprehensive reforms in the energy sector.

The Ministry of Economy and Finance, as well as the Ministry of Energy, will gradually introduce a climate change monitoring, reporting and verification (MRV) system and database, also from April 1, 2024.

In addition, the construction of solar stations with a total capacity of 400 MW is expected in the Andijan region, alongside an electricity storage system with a capacity of 150 MW.

International partners including Chinese companies will participate in these developments, while Indian partners will help complete the construction of three small and micro hydroelectric power plants within two years, and launch two micro hydroelectric power plants on the Shakhrikhansoy canal.

Three wind power plants, each with a capacity of 600 MW, are expected to begin construction this year in the Bukhara and Navoi regions.

About 500 km of high voltage transmission lines are being built and the capacity of five substations will be increased to connect the new plants to the grid. The share of renewable energy in the country's energy system is expected to increase to 15 per cent in 2024.

Nigeria urged to fully open power sector to private investors

Following the inauguration of Geometric's 188 MW gas power plant in Aba, Abia State this year, former Vice President and main opposition leader Atiku Abubakar has called on the government to open up the entire power sector for private investments.

Abubakar urged the Nigerian government to double efforts to support companies such as Geometric by providing the business environment that enhances the competitiveness of private enterprises through reduced setup and operational costs.

He called on the government to provide incentives for the private sector to increase greenfield investments in the development of off-grid solutions for electrification, particularly in rural communities not yet served by the transmission grid.

Abubakar noted that the Aba project was a "significant milestone" for many reasons, primarily for improving people's access to electricity, which eludes more than 40 per cent of Nigeria's 220 million population.

He said the project is also a big boost to businesses in the Aba region – one of the southeast's industrial centres. Inadequate power infrastructure is the most problematic factor for doing business in Nigeria, with more than 70 per cent of firms using generators.

Finally, Abubakar congratulated the company for delivering the gas power plant, demonstrating the capacity of the local private sector to deliver on such complex projects.

Power Minister Adebayo Adelabu, said ongoing upgrades would improve electricity supply within the next three to six months. He also pledged to get electricity distribution companies (DisCos) to step-up their game – through investment or "legal backing" if necessary. While DisCos do not have sufficient funds for infrastructure upgrades, they should ensure good service delivery to justify a tariff review, Adelabu said, bemoaning the rise of vandalism at power assets across the country. He pledged firm punishment for the vandals.

"They kill people, and they kill businesses," he said, noting that despite an installed capacity of 13 GW, Nigeria was only able to generate from 5 GW.

The Chief Executive Officer of Ikeja Electric, Folake Soetan, praised the company's achievements in terms of infrastructure upgrades and capital expenditure, with CAPEX growing tenfold from 2015 to 2023 and electricity meters rising from 30 000 to 800 000 over the same period.

The finances required to bridge Nigeria's infrastructure gap are estimated to be in the region of $100 billion per year over the next 30 years.

Shell retreats from 2030 carbon emissions reduction target

- Net carbon intensity target reduced as it loses appetite for shift from oil and gas to renewables
- Backtrack seen as a "bet on failure of Paris Climate Agreement"

Junior Isles

Shell has weakened its 2030 carbon reduction target and scrapped a "perilous" 2035 objective, citing expectations for strong gas demand and uncertainty in the energy transition.

In an annual update on its energy transition strategy, Shell said it will target a 15-20 per cent reduction in net carbon intensity of its energy products by 2030 compared with 2016 intensity levels. It had previously aimed for a 20 per cent cut.

The changes to Shell's targets are a central pillar in CEO Wael Sawan's strategy revamp to focus on higher-margin projects, steady oil output and growth in production of natural gas in order to boost returns.

Oil majors have also come under increased investor pressure to focus on the most profitable businesses after reporting bumper profits in recent years, while returns from projects based on renewables slumped.

Measuring emissions from burning fossil fuels by intensity rather than in absolute terms means a company can technically increase its fossil fuel output and overall emissions while using offsets or adding renewable energy or biofuels to its product mix.

Shell, the world's largest liquefied natural gas (LNG) trader, said that it believed gas and LNG will play a critical role in the energy transition by replacing more polluting carbon in power plants. At the same time, it expects its power sales, which include renewable power, to be lower than previously forecast.

The company has now scrapped a previous target to reduce its carbon intensity by 45 per cent by 2035. Sawan told *Reuters* that it was "perilous" for Shell to set 2035 emission reduction targets because "there is too much uncertainty at the moment in the energy transition trajectory".

Mark van Baal, founder of Follow This, which co-filed a climate resolution at Shell's upcoming annual general meeting, said that, "with this backtrack, Shell bets on the failure of the Paris Climate Agreement which requires almost halving emissions this decade". Follow This is a group of over 10 000 green shareholders in 'Big Oil', whose mission is to drive the energy transition from fossil fuels to renewables.

Philip Evans, Campaigner at Greenpeace UK, said: "Wael Sawan's decision to further weaken Shell's already wafer-thin net zero commitments should come as no surprise, but with floods, fires and climate chaos raging around the world, it is all the more alarming. Since taking over last year, Sawan has doubled-down on fossil fuels while ruthlessly slashing jobs and investment from Shell's renewables division…"

At the end of February, the company launched a sale process for all or parts of a pipeline of up to 10.6 GW of solar generation and storage projects currently in development across the US.

The transaction is said to concern about a quarter of the assets that belong to the company's US utility-scale solar and energy storage business Savion. Shell agreed to buy Savion from the Green Investment Group in December 2021. The Kansas City, Missouri-based company currently has 21.8 GW of solar and 17.3 GW of energy storage projects in development across the country.

Earlier in February, Shell and Irish offshore renewables developer Simply Blue said they would exit floating wind joint ventures to better focus on other markets. As part of the move Shell will sell its 80 per cent stake in the 1.25 GW MunmuBaram floating offshore wind project off the coast of Ulsan, South Korea, to its joint venture partner Hexicon.

■ About 500 companies including Microsoft, Unilever and JBS have been removed from a validation process for their climate plans after failing to submit sufficiently ambitious targets. Companies argue that governments have not created the policy frameworks needed to achieve the emissions reductions, making it difficult for them to move as fast as they originally thought.

"The conversation in a lot of places is that we have missed the 1.5°C [warming threshold] already… but at the same time you're being told you have to set a 1.5°C target," Nicola Davidson, Vice-President for sustainable development and corporate communications at steelmaker ArcelorMittal, told the *FT*.

"We felt this [1.5°C target] was too big a step-up in terms of ambition given what we see globally, when you look at our footprint, for all the [policy] levers required to accelerate the steel industry's transition," Davidson said.

Iberdrola sets out global investment plans

Spanish electricity company Iberdrola has outlined plans for global investments of €41 billion ($44.3 billion) over the next three years – the majority for transmission networks for projects in the US and UK.

Most of the €41 billion gross investment – which also includes the recent purchase of the remaining 18.4 per cent share in its US subsidiary Avangrid – will be split between the US (35 per cent), followed by the UK (24 per cent), Iberia (15 per cent), Latin America (15 per cent) and Germany, France, Australia and others (11 per cent).

It said more than 50 per cent will go to offshore wind in the US, UK, France and Germany, and that there would be "selective investment in renewables" to the tune of €15.5 billion. The company's partners in renewables – investors that include Norway's sovereign wealth fund and Masdar – will contribute €5 billion of the overall gross investment.

"Our strategy will focus on delivering enhanced grid to support security of supply, now 60 per cent of our total investment, as well as a strong expansion of renewables capacity, driven by the substitution of fossil technologies and additional demand," said Ignacio Galán, Iberdrola's Executive Chair. "We also recognise the increasing role of storage technologies to preserve the balance between supply and demand 24 hours a day."

Iberdrola says it will direct the biggest portion of the €41 billion ($44 billion) plan to the US, regardless of the potential impact of a possible Donald Trump presidency on America's flagship green energy policy.

Former US President Trump, who is leading in the polls ahead of the November election, has signalled he wants to repeal the Inflation Reduction Act (IRA), the landmark climate bill of Joe Biden's presidency that provided $369 billion in tax breaks and subsidies for clean energy.

The company noted, however, that it had already received all the IRA tax credits due for its 2024-26 projects.

Galán said: "We are not depending in our plan on the IRA being maintained. We would be very pleased if it was maintained of course, but for the present it's not in our plan at all."

Meanwhile the UK is set to set to see a record £12 billion ($15.14 billion) investment from Iberdrola – more than Spain, Germany, France and Australia combined.

■ The European Investment Bank (EIB) has approved a €700 million green loan to expand Iberdrola's electricity-distribution grid in Spain. An initial, €500 million tranche was signed in March in Madrid.

Hitachi Energy to appoint new CEO

Hitachi Energy has announced that Andreas Schierenbeck is to replace Claudio Facchin as Hitachi Energy CEO, effective from July 1, 2024. Schierenbeck will engage with the Hitachi Energy Board, Executive Team and Facchin to ensure a smooth transition prior to the handover.

Schierenbeck joins Hitachi Energy from HH2E, a new green hydrogen production company, where he is currently co-founder and board member. He previously worked as CEO of German energy utility Uniper from 2019 to 2021, where he launched the company's decarbonisation strategy.

Commenting on the appointment, he said: "I am thrilled to embark on this journey as the new CEO of Hitachi Energy, steering the company towards new horizons in an era of transformation, where the demand for electricity is surging due to the rapid electrification of transport, buildings, and industries."

■ In February Hitachi Energy announced a more than €30 million ($32 million) investment plan to expand and modernise its power transformer manufacturing facility in Bad Honnef, Germany. Expected to be completed in 2026, the project will generate up to 100 new jobs in the region and address the rising demand for transformers to support Europe's clean energy transition.

Topsoe reports record revenue driven by energy transition

Topsoe, a global leader in carbon emission reduction technologies has reported record revenue and earnings, combined with an all-time high in investments in technologies and solutions that support the energy transition.

Revenue increased by 38 per cent to DKK9416 million ($1.36 billion) compared to 2022, with 20 per cent of revenue (DKK1900 million) coming from business related to technologies and solutions that enable the production of e-fuels, low-carbon fuels and renewable fuels.

Roeland Baan, CEO, Topsoe said: "Last year was a significant year for Topsoe. We grew our business across segments, while delivering on our own transformation. The past few years, we have invested heavily in technologies that enable net zero and made significant progress to be the preferred partner for customers who want to reduce their carbon emissions. Today, we have strong market positions within low-carbon and renewable fuels and are involved in some of the most innovative power-to-X projects globally."

Americas

HVDC technology to connect US grids

Hitachi Energy will supply Grid United with high voltage direct current (HVDC) technology for transmission projects to interconnect the eastern and western regional power grids in the USA. These projects will boost transmission capacity across the USA.

Under a capacity reservation agreement, Hitachi Energy will provide HVDC technology to support the development of multiple Grid United HVDC interconnections. These interconnections will help mitigate the impact of extreme events and accommodate the growing demand for electricity. The two companies are exploring potential projects to further strengthen the US electric grid.

These projects will help overcome one of the most persistent bottlenecks in the energy transition in the US by bridging the east-west divide. They also will play an important role in supporting the US government's commitment to accelerating the energy transition, and specific stated priorities of the US Department of Energy.

Equinor successfully rebids in NY4 solicitation

Equinor has successfully rebid into New York's fourth offshore wind solicitation (NY4). Vestas has a current conditional order in place for the 810 MW Empire Wind 1 project, to which it will supply its V236-15.0 MW offshore wind turbines.

The V236-15 MW prototype turbine was installed in December 2022 and is currently undergoing the final verification campaign.

ABB and Green Hydrogen International team up

ABB and Green Hydrogen International (GHI) are collaborating on a project to develop a major green hydrogen facility in south Texas, USA. The power-to-X facility will use solar and onshore wind energy to power a 2.2 GW electrolyser plant to produce 280 000 tons of green hydrogen per year.

ABB will supply automation, electrification and digital technology for deployment at GHI's Hydrogen City project.

The project will involve underground salt cavern storage. The planned storage of up to 24 000 tons of green hydrogen will help balance out the intermittency of the renewable energy sources powering the operation.

Construction is planned to start in 2026 with first production expected in 2030. Hydrogen City is being designed as a phased project, with plans to add additional trains of production as the market for green hydrogen develops.

Wärtsilä gas engines to expand New Mexico plant

Wärtsilä will supply the generating equipment for an 18 MW expansion to an existing power plant in New Mexico, USA. The plant will operate on natural gas fuel, and will replace lost generating capacity following the closure of a coal fired power plant and also provide flexible dispatchable power for the utility and their power needs.

The two Wärtsilä 34SG gas fuelled engines selected for this project are also capable of operating on biogas, synthetic methanol and hydrogen blend. They require minimal water consumption, which is an important consideration in areas such as New Mexico where high ambient temperatures can be expected and water is scarce.

The equipment for the project is expected to be delivered by January 2025.

GE Vernova supports Colorado energy transition

GE Vernova's Gas Power and Financial Services businesses have announced an order from Kindle Energy for six of its LM2500XPRESS power packages to deliver fast power to Colorado's United Power electric cooperative as required.

The six units will be installed at Mountain Peak Power plant, in Keenesburg, Weld County, Colorado, USA. Once in operation, scheduled for 2025, the plant is expected to deliver up to 162 MW to support the ongoing energy transition in the state.

In addition to the power generation equipment, GE Vernova's Financial Services business provided co-development funding to enable accelerated development and construction to ensure the availability of the power in alignment with United Power's capacity needs.

The plant will be powered by six LM2500XPRESS power packages, with the capability to start in as little as five minutes from cold. Each LM2500XPRESS comprises of LM2500 aeroderivative gas turbine, a distributed control system and a Dry Low Emissions combustion system

Asia-Pacific

EPC order for India supercritical plant

NTPC has awarded an EPC contract to Bharat Heavy Electricals Limited (BHEL) for the 800 MW Singrauli Supercritical Thermal Power Plant stage III.

The plant will be set up adjacent to the existing 2000 MW thermal power station at Singrauli in Sonebhadra district of Uttar Pradesh.

Key equipment for the power plant will be supplied by BHEL's manufacturing units at Haridwar, Trichy, Bengaluru, Hyderabad, Ranipet and Bhopal.

LS Cable secures Feng Miao 1 cable contract

Copenhagen Infrastructure Partners (CIP) has signed a preferred supplier agreement with LS Cable for the supply of offshore and onshore cables to CIP's third offshore wind project in Taiwan, the 500 MW Feng Miao 1 project.

LS Cable will supply offshore export cables, inter-array cables and onshore export cables from their Korean manufacturing facility to the 500 MW Feng Miao 1 offshore wind project in Taiwan.

Feng Miao 1 project is owned by CIP's Flagship Fund V (CI V), and is currently in the late development stage, finalising design and procurement in preparation for financial close.

Shunt reactors for India transmission grid

GE Vernova's Grid Solutions business has been awarded orders from Power Grid Corporation of India Limited (PGCIL) for the supply of 765 kV Shunt Reactors for various transmission system projects in India. These projects are part of PGCIL's efforts to integrate renewable energy into the national electricity grid and enhance electricity transmission within the country, particularly in regions such as Rajasthan and Karnataka.

The orders will be executed through GE T&D India. GE T&D India will be responsible for providing the complete equipment package, including design, engineering, manufacturing, testing, erection, and commissioning of the 765 kV class reactors at the designated transmission substation sites. The reactors will be manufactured at GE T&D India's Vadodara plant and are scheduled for delivery in the financial year 2025-26.

Europe

European wind turbine orders for Vestas

Renewable energy company ENHOL has placed a 51 MW order with Vestas for the Cascante wind park, to be located in Navarra, Spain. The contract includes the supply and installation of eight V162-6.2 MW wind turbines delivered in 6.4 MW power mode, as well as a 20-year Active Output Maintenance (AOM) 5000 service agreement.

Turbine delivery is expected to start in the fourth quarter of 2024, while commissioning is planned for the first half of 2025.

In addition, Vestas has received an order from Thyborøn-Harboøre Vindmøllelaug for a V236-15.0 MW wind turbine to be installed directly on the waterfront in the Port of Thyborøn in the northwestern part of Denmark. The order comprises one V236-15.0 MW wind turbine and includes supply, delivery, and commissioning of the unit. The order also includes a 20-year AOM4000 service agreement as well as an agreement for Vestas to perform test and verification activities on the turbine.

Wind turbine delivery is planned to begin in the first quarter of 2024 with commissioning scheduled for completion in the second quarter of 2024.

Furthermore, Vestas has also won a 65 MW project for V172-7.2 MW turbines from Enova Power for a repowering project in Meppen, Lower Saxony, Germany.

The order consists of nine V172-7.2 MW wind turbines and includes supply, delivery, and commissioning of the turbines. Upon completion, Vestas will service the turbines under a 25-year Active Output Management 5000 (AOM 5000) service agreement. Turbine delivery is expected to begin in the fourth quarter of 2025 with commissioning scheduled for the first quarter of 2026.

Agreement for UK's SMR-300 programme

Mott MacDonald has signed an MOU with Holtec Britain and Hyundai E&C to further explore the delivery of Holtec's small modular reactor (SMR) technology in the UK. The agreement builds on the Clean Energy Partnership signed between the UK and Korean governments late last year.

Mott MacDonald has been appointed as the delivery partner for the Generic Design Assessment (GDA) of Holtec Britain's SMR-300 in the UK, having secured £30 million of grant funding from the government's Future Nuclear Enabling Fund for this.

NKT wins power cable projects in Germany

NKT has been awarded two onshore power cable projects valued at €1.2 billion by the German TSO Amprion. NKT will provide high-voltage AC and DC onshore power cable systems for the ongoing expansion of the German power grid.

NKT will design, manufacture and install the high voltage power cable systems with voltage levels of 110 kV, 380 kV AC and 525 kV DC.

The majority of the power cables for the two projects will be manufactured in Cologne, which is located close to the installation sites.

First contract awards for Polish nuclear plant

Bechtel has announced that it has awarded its first procurement contracts for construction of Poland's first nuclear power plant. These first contracts will go to Polish suppliers.

The companies who have signed agreements to partner with Bechtel include: Energoprojekt Katowice to provide services for codes and standards, and environmental permitting strategy; Prochem to support permitting documentation; and Summa Linguae for translation services.

In partnership with Westinghouse Electric Company, Bechtel will deliver three AP1000 reactors for Polish utility Polskie Elektrownie Jadrowe for its inaugural nuclear energy project.

International

Toshiba wins order for Kenya geothermal plant

Toshiba Energy Systems and Solutions has won an order from SEPCO3 Electric Power Construction for steam turbines and generators to renovate units 1-3 of the 45 MW Olkaria I geothermal power plant in Kenya. The equipment will be shipped to site by December 2025.

Olkaria I is the oldest geothermal power plant in Kenya and has been in commercial operation by the Kenya Electricity Generating Company (KenGen) since 1981. Units 1-3 need renovation due to aging. The renovation will increase the power output of each unit from 15 MW to 21 MW.

Toshiba ESS and KenGen have also signed an MOU to provide O&M services for geothermal power plants for developing East African countries outside Kenya.

Equipment deal for Saudi power plant

A $114 million contract to supply equipment for Saudi Arabia's largest under construction combined cycle power plant project has been awarded to Doosan Enerbility.

Under the terms of the contract, Doosan Enerbility will supply two 650 MW steam turbines and generators for the Qassim 1 and Taiba 1 power plants, with a combined capacity of 3600 MW.

The agreement was reached with China's SEPCO3, responsible for the EPC of the combined cycle power plants in the Taiba and Qassim regions in Saudi Arabia.

The two plants, located 200 km north of Jeddah and 200 km northwest of Riyadh, are expected to be operational by 2027.

Ansaldo Energia wins GT contract for Almaty 3

Ansaldo Energia has won a supply contract from KBI Energy to deliver two AE94.2 gas turbines, two generators, and associated auxiliary equipment for the Almaty CHPP-3 gas fired combined cycle power plant in Kazakhstan.

Ansaldo Energia's AE94.2 gas turbines are designed to run on natural gas mixed with up to 40 per cent hydrogen.

Hydrogen

Biden-Harris Administration makes $750 million available for clean hydrogen

The US has set its sights on being a leader in the energy transition. To do that it is making large amounts of money available for investment in research and innovation for new projects. Last month the Department of Energy announced a new allocation of funding designed to promote the application of clean energy projects that are emphasising the creation of hydrogen.

Gary Lakes

The US Department of Energy (DOE) last month announced that $750 million is now available for investments in clean hydrogen technologies. The financing is designed to boost clean energy production within the US and grow the industry.

A statement released on March 13 said: "As part of President Biden's Investing in America agenda, the DOE today announced $750 million for 52 projects across 24 states to dramatically reduce the cost of clean hydrogen and reinforce America's global leadership in the growing clean hydrogen industry."

The projects, which are funded by Biden's Bipartisan Infrastructure Law, will advance electrolysis technologies and improve manufacturing and recycling capabilities for clean hydrogen systems and components, directly supporting more than 1500 new jobs, the statement said.

The announcement "reinforces the Biden-Harris Administration's whole-of-government approach to speeding up the deployment of clean hydrogen – as laid out in the US National Clean Hydrogen Strategy and Roadmap and coordinated by the Hydrogen Interagency Task Force."

The 52 projects eligible for funding are expected to enable US manufacturing capacity to produce 14 GW of fuel cells every year, enough to power 15 per cent of medium- and heavy-duty trucks sold each year, as well as 10 GW of electrolysers per year, enough to produce an additional 1.3 million tons of clean hydrogen annually.

"The Biden-Harris Administration is propelling an American-led clean hydrogen economy that is delivering good-paying, high-quality jobs and accelerating a manufacturing renaissance in communities across America," US Secretary of Energy Jennifer M. Granholm said in the statement. "The projects announced today will supercharge our progress and ensure our leadership in clean hydrogen will be felt across the nation for generations to come," she added.

The Biden-Harris Administration has put together a number of programmes designed to encourage an energy transition designed to combat climate change and see a steady decline in greenhouse gas emissions, as well as transform the US and global economic model that relies on hydrocarbons as the prime source of energy.

"Together with the Regional Clean Hydrogen Hubs (H2Hubs), tax incentives in the President's historic Inflation Reduction Act, and ongoing research, development, and demonstration in the DOE Hydrogen Programme, these investments will help DOE achieve its ambitious Hydrogen Shot goal of reducing the cost of producing clean hydrogen to $1 per kilogram," the DOE said.

The programmes put forward by the US administration are designed to introduce clean hydrogen to energy-intensive and high-polluting industrial sectors such as heavy-duty transportation and the manufacture of steel and fertilisers. Clean hydrogen can support the expansion of clean electricity through long-duration storage. It will also offer diverse pathways for the development of clean energy systems throughout numerous economic sectors.

The projects selected by this latest action include: low-cost, high-throughput electrolyser manufacturing; electrolyser component and supply chain development; advanced technology and component development; advanced manufacturing of fuel cell assemblies and stacks; fuel cell supply chain development; and a recovery and recycling consortium.

The US government has also been funding carbon capture and storage projects for more than a decade, some of which are designed to produce hydrogen by using natural gas, but most captured CO_2 is reinjected into oil and gas wells to enhance recovery. New projects call for CO_2 to be stored away underground forever. However, the ultimate goal towards producing green hydrogen or ammonia is to cut out the CO_2 factor altogether and use renewable energy for production.

There are 15 CCS facilities operating in the US with a combined capacity to capture 0.4 per cent of the country's annual CO_2 emissions. Another 121 CCS facilities are under construction or in development. If all are completed, they would increase CCS capacity to 3 per cent of current annual emissions. Most CCS projects in the US are in sectors where the cost of capturing CO_2 is low, such as natural gas processing, or ammonia and ethanol production.

Between 2011 and 2023, the federal government has provided $5.3 billion for CCS research and related programmes. The 2021 Infrastructure Investment and Jobs Act gives $8.2 billion in advance appropriations for CCS programmes from 2022 to 2026.

Carbon capture, utilisation and storage (CCUS) has yet to actually prove its worth. While a number of large international plans have been announced, there has been no significant headway made in developing projects. There are questions about the entire advancement of CCUS especially from environment and climate activists.

The extent to which CCUS will be used in the future depends on several factors, among them: the cost of CO_2 capture; the availability of pipeline networks and storage capacity; federal and state regulatory decisions; and development of clean energy technologies that may impact CCS demand.

Gas

Gas exporters see big demand for gas in 2050 Outlook

As the world begins to move forward with plans to transition to economies based on clean energies, a big question revolves around how much gas will be needed to bridge the gap as economies shift from hydrocarbons to renewables. The newly released 'Outlook 2050' from the Gas Exporting Countries Forum sees a surge in demand over the next 25 years.

Gary Lakes

The Gas Exporting Countries Forum (GECF) last month released the 8th edition of its 'Outlook 2050' in which it forecast a 34 per cent increase in demand for natural gas by 2050 compared to levels recorded in 2022. GECF figures show demand in 2050 at around 5360 billion cubic metres (bcm), up substantially from 4015 bcm in 2022.

Driving this growth in demand is the expansion of the world's population, which is expected to reach 9.7 billion people by 2050, an increase in economic production, especially in non-OECD countries, global efforts to reduce greenhouse gas emissions and improve air quality by reducing the use of oil and coal, as well as policies designed to accelerate the energy transition.

Together, these forces will see global primary energy demand rise from 14 960 million tons of oil equivalent (mtoe) in 2022 to 17 925 mtoe in 2050 – a 20 per cent increase and an average annual growth rate of 0.6 per cent. The Asia Pacific region is expected to account for about half of this increase, while Africa will account for a quarter.

The share of fossil fuels in the global energy mix is expected to decrease from 80 per cent in 2022 to 63 per cent in 2050, the Outlook 2050 says. Throughout ongoing energy transitions, renewables are anticipated to experience the highest growth rate, with their share projected to rapidly increase from 3 per cent in 2022 to 17 per cent in 2050, it adds.

"Natural gas is poised for an average annual growth rate of 1 per cent over the forecast period, ultimately surpassing coal as the second largest energy source by the latter half of the 2020s," the report stated. "Due to the rapid expansion of electrification, a combination of natural gas and renewables is expected to account for around 68 per cent of the total electricity supply by 2050. Carbon capture, utilisation, and storage (CCUS) is expected to gain momentum, significantly contributing to lowering electricity generation greenhouse emissions."

Meanwhile, the demand for hydrogen is expected to triple over the next 25 years from around 100 MtH_2 in 2022 to nearly 300 MtH_2 by 2050. According to the report, Asia Pacific and Europe are poised to emerge as the leading demand centres, representing just above 70 per cent of the expanded market. Hydrogen generated from natural gas is projected to contribute 43 per cent of total hydrogen generation by 2050, with over 85 per cent of hydrogen generation sourced from natural gas and renewables over the forecast period.

As might be expected, the gas exporters see a strong promise with carbon capture. It is through carbon capture that the gas industry hopes to maintain its viability as an energy source that will produce electricity and blue hydrogen in processes that remove carbon from emissions and stores it away.

The rise of blue hydrogen generation is positioned as a substantial pathway for enhanced utilisation of natural gas, the report says. The growth potential is conditioned by the development of an international hydrogen market, it adds.

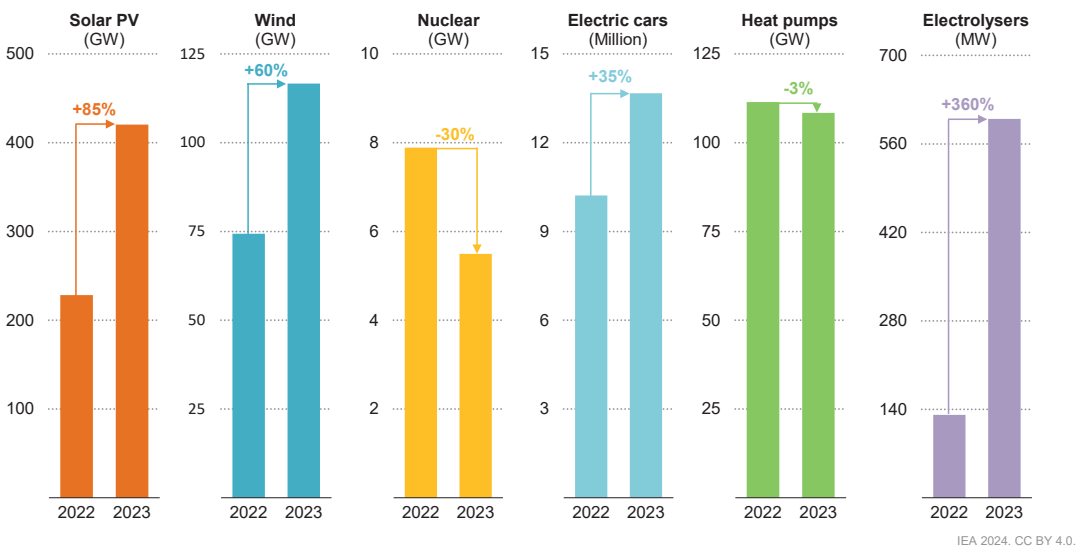
"Natural gas, coupled with CCUS, is poised to underpin long-term demand, while the utilisation of blue hydrogen offers an additional pathway for decarbonising hard-to-abate sectors," the report said. "Natural gas demand expansion is primarily in the power generation sector, contributing 500 bcm to, and constituting 37 per cent of the total growth."

"This growth is attributed to the accelerated electrification and to policies aimed at phasing down coal fired power generation capacity. As the share of renewables expands, natural gas fired power generation is projected to play an increasingly vital role, offering essential flexibility and backup support to solar and wind power, and to hydropower during periods of drought," the report says.

LNG trade is on track to surpass long-distance pipeline trade by 2026, more than doubling by 2050 to reach 805 Mt (1110 bcm), constituting 64 per cent of traded gas. The Asia-Pacific region remains the leading long-term LNG import market. China is expected to be the largest growth market in the current decade, and India is to assume that role after 2030. South and Southeast Asia are poised for the highest incremental LNG import growth, albeit from a lower starting point.

From a regional standpoint, the majority of future natural gas demand growth is anticipated to emanate from the rapidly growing Asia Pacific markets and gas-rich Middle Eastern and African countries, the report says. Asia Pacific alone is forecasted to add almost 700 bcm, constituting 52 per cent of the global net demand growth during the outlook period, with China, India, and Southeast Asian countries leading the way.

Annual deployment of selected clean energy technologies, 2022 and 2023



Note: "Annual deployment" refers to sales or capacity additions. GW = gigawatt; MW = megawatt; Mn = million.

Clean Energy Market Monitor 2024, © IEA/OECD, page 11

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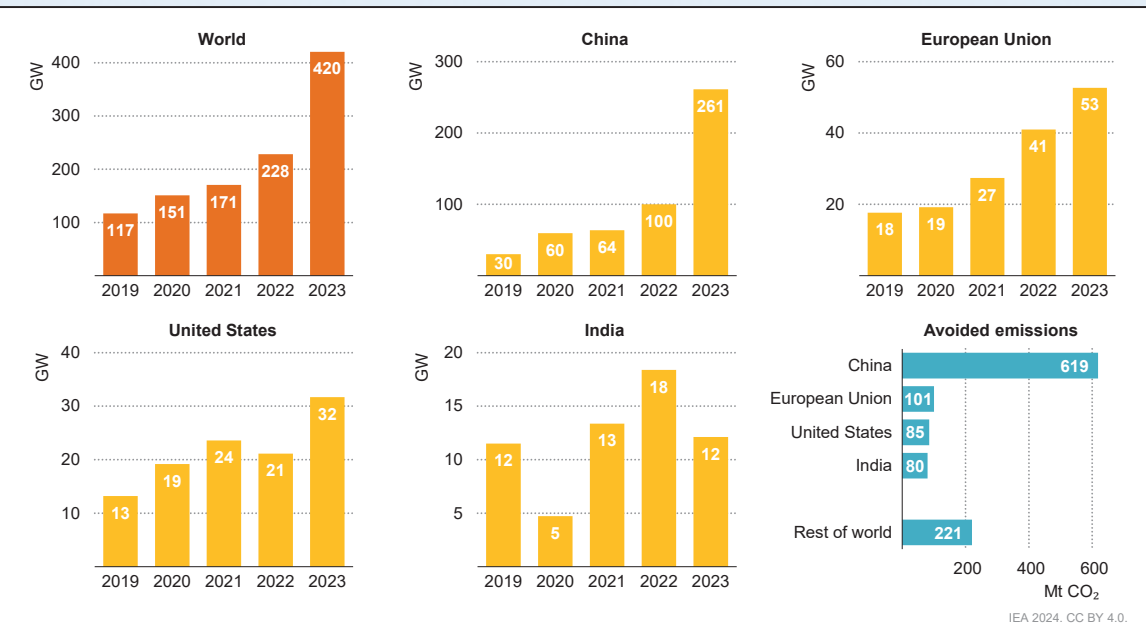
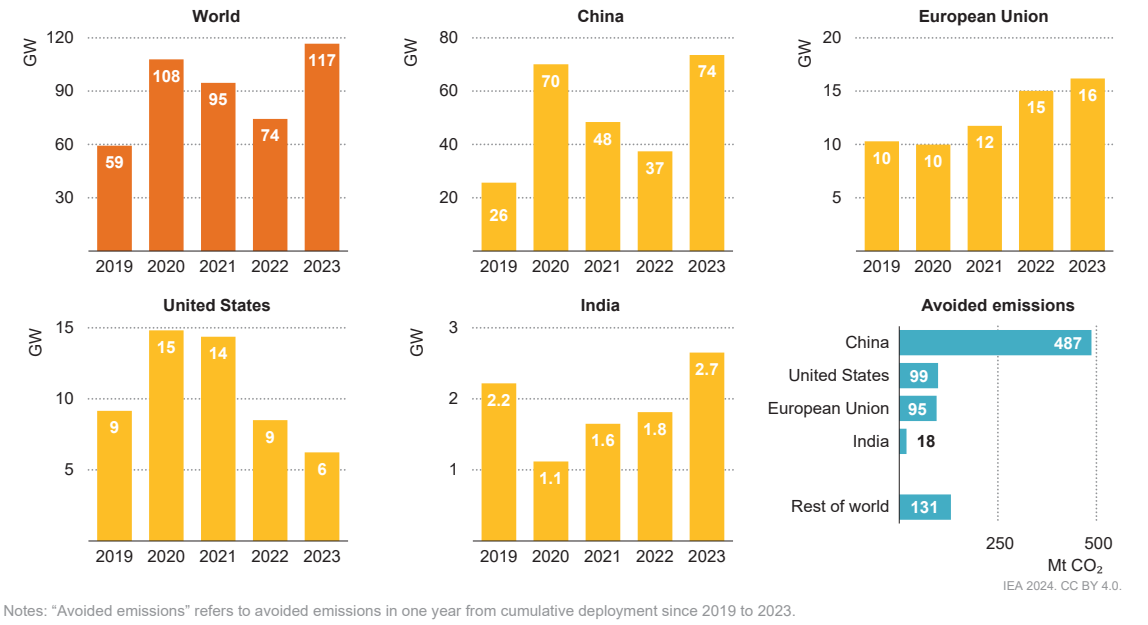
Solar PV capacity additions and avoided emissions



Notes: "Avoided emissions" refers to avoided emissions in one year from cumulative deployment since 2019 to 2023.

Clean Energy Market Monitor 2024, © IEA/OECD, page 13

Wind capacity additions and avoided emissions



Notes: "Avoided emissions" refers to avoided emissions in one year from cumulative deployment since 2019 to 2023.

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Getting heat pumps back on track is crucial for EU decarbonisation

Following rapid growth in recent years, Europe's heat pump market has cooled. The European Heat Pump Association's **Jozefien Vanbecelaere** says an EU Heat Pump Action Plan is essential to get the technology and Europe's energy transition back on track.

In 2022, Europe's heat pump sector was riding a wave of support, leading to all-time record sales.

Yet a mere year later, momentum has slowed. The first 2023 market data shows that sales dropped 5 per cent overall in 14 countries compared to the previous year. What's more, the overall trend, quarter-by-quarter was downwards. Now, manufacturers are having to cut jobs and report a gloomy outlook for 2024.

What caused this change, and how can it be addressed? After all, heat pumps are recognised by the European Union and its leaders as crucial for decarbonisation, and have a central spot in the EU's Green Deal and its climate and energy plans for 2030.

Certainly, 2022 was a significant year in many ways. In February, Russia invaded Ukraine, sending gas prices spiralling – which made electric heat pumps proportionately cheaper. In response, the European Commission launched a plan to reduce the EU's energy imports. The plan centred on increasing the number of installed heat pumps by 60 million in 2030.

The heat pump sector was then identified as a key net zero industry in the EU's plans to boost domestic clean tech, also in part triggered by the global reaction to the war.

It was this combination of clear support at EU level, alongside sky-high gas prices and national support measures to help consumers invest in electric heat pumps that pushed sales by 39 per cent to 3 million in 2022. The total heat pumps installed – in around 16 per cent of European buildings – avoid carbon emissions equivalent to those of Greece. And that is domestic and commercial heat pumps alone, with the huge potential of large heat pumps in district heating and industry being increasingly explored *(see box)*.

In response, the heat pump sector planned investments in factories, production, R&D and training in a range of European countries. These investments are worth €7 billion to 2025 alone.

Yet even then, and despite the bright picture and the commitment of the sector, it was clear that the ambitious EU targets would be a challenge unless some crunch points for the sector were addressed. These included a shortage of installers, and electricity price issues.

Accordingly we at the European Heat Pump Association (EHPA), along with the European Climate Foundation – a Brussels-based NGO – convened a group of just over 20 associations, charities, think-tanks and national representatives, as well as officials from the European Commission itself. The aim was to work together to build a report describing the barriers to a faster roll-out of heat pumps, and the ways to overcoming them.

At the kick-off meeting of this group, the EU officials present announced the very positive news that the Commission would work on a 'Heat Pump Action Plan' and the EHPA's report would be welcome as key input.

We accordingly developed the report, known as the Heat Pump Accelerator, and handed it over to EU Energy Commissioner Kadri Simson in June 2023. We continued to input consistently and regularly to the Commission as it developed the Heat Pump Action Plan.

But as 2023 went on, there were signs of a slowdown in the market already. Gas prices fell while electricity bills remain under a heavy tax burden in many countries. This delays the return on investment for a heat pump.

In many countries, like Germany and the UK, the energy transition in heating started to become a political issue. As a result, ambitions were lowered and end-users became uncertain and less willing to switch to new systems.

It was clearer than ever that the announced Heat Pump Action Plan would be crucial to address some of these issues. The EHPA consistently emphasised to the European Commission that it was key the Plan showed high-level commitment to the technology through stable policies and strong consistent measures.

We and our members were therefore surprised, if not dismayed, to be informed by the European Commission, just before Christmas 2023, that it would delay publication of the Action Plan until after the EU elections.

Vanbecelaere: delivering rapid and clear high-level policy support is essential. *Photo credit: Michel Petillo*

This is exactly the opposite of the economic and ambitious political framework needed to shape a strong home market for a successful industry. Along with over 60 CEOs and industry leaders we pointed this out in a letter to European Commission President Ursula von der Leyen. In that letter – and in another letter signed by 20 organisations – the EHPA called for the Commission to set it in motion immediately to put Europe back on track for the energy transition as well as for energy independence and climate neutrality.

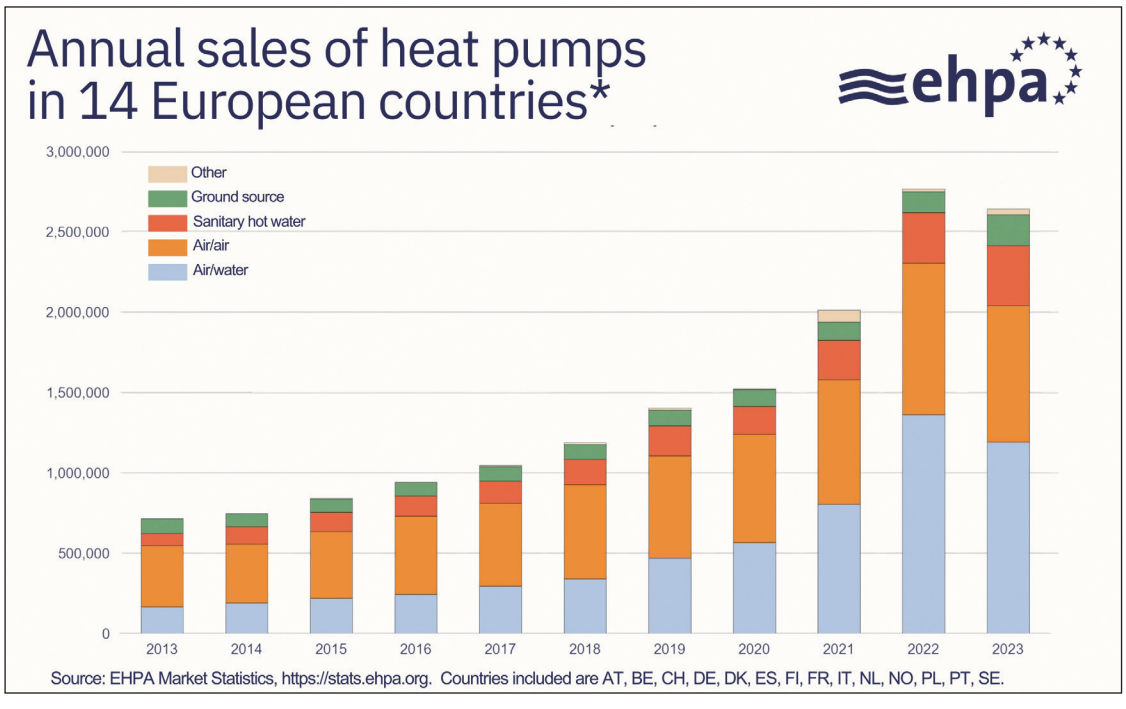
Postponing the Heat Pump Action Plan makes it harder to ramp up the heat pump roll-out, which is crucial to achieve Europe's energy and climate targets. It also undermines investments in industrial production in Europe, affecting the over 160 000 direct existing and many more future jobs in manufacturing and installation.

In the US, the ambitious Inflation Reduction Act (IRA) provides continuity, legal stability, and generous financial support for heat pumps. Postponing the EU plan risks jeopardising Europe's industrial leadership on net zero technologies, just as the US, Asia and other regions are also ramping up their commitments on clean and heat pump technologies.

If heat pumps are to get back on track, delivering rapid and clear high-level policy support in the form of an EU Heat Pump Action Plan is essential. A strong heat pump market will allow Europe to reap the benefits: decarbonisation, job creation, a competitive clean tech industry, energy independence and lower energy bills.

Jozefien Vanbecelaere is Head of EU Affairs at the European Heat Pump Association.

Annual sales of heat pumps in EU-14
** These 14 countries made up 90 per cent of the European heat pump market in 2023*



From pasta-making to pasteurisation

From pasta-making to the pasteurisation of milk, from a chemicals plant to a furniture factory, heat pumps are helping decarbonise industrial processes.

The potential is huge. Heat pumps are increasingly able to provide the high levels of heat needed in industry. Large heat pumps today can reach temperatures of over 180°C, which is enough to meet the heating demand of 37 per cent of industry. This matches the needs of sectors where a lot of drying takes place (pulp and paper, wood, fruits and vegetables) or applications like pasteurisation, distillation, food production sectors, and sectors that need both heating and cooling of products and processes in general.

What is more, they have high capacities – ranging from 100 kW to 50 MW. This is many times more powerful than residential heat pumps, whose capacities normally range from around 6 kW to 15 kW.

Electric heat pumps are clean and renewable – taking energy from sources like the air, underground, or water. Especially in industrial processes, the use of waste heat (for example, from a refrigeration process) as their energy source is particularly appropriate and efficient.

And they are highly efficient, providing three to five times as much heating or cooling as the small amount of power they consume. So just like in residential settings, more heat pumps in industry means less use of fossil fuels such as gas.

Already today, greenhouse gas emissions from industrial heating could be cut by 78 per cent if heat pumps were rolled out everywhere possible. By 2050, they could be cut by a massive 99 per cent.

Heat pumps also provide flexibility to the electricity grid, because they can be switched on and off depending on the power price.

China: the world's biggest carbon market is set to surge

China's electricity sector is the largest in the world, and the most polluting. The country aims for peak carbon emissions by 2030 and carbon neutrality by 2060. It is a complex and difficult task that raises many questions. Can a carbon market help curb its emissions? Is the country truly committed and what does the future hold? **Joseph Jacobelli** explores.

China faces one of the greatest energy transition challenges in the world. Perhaps only India's challenge is bigger. This challenge is especially acute for its electric power sector. Since 1979, the astonishing economic growth has been one of the fastest in the world. To power this development, it relied on the cheapest and most abundantly available domestic resource, thermal coal. Coal accounted for almost four out of five tons of carbon dioxide emitted in 2021, according to the International Energy Agency (IEA).

The electric power sector has been one of the biggest coal users. At its peak, in 2007, about 81 per cent of power output was from thermal coal fired power plants, as calculated from data from the Energy Institute. The amount has steadily fallen to about 61 per cent in 2022, down a considerable 20 percentage points.

There is no doubt China needs an effective carbon market as one of the tools to decarbonise its economy. So how does the market work?

Some of the tools that nations may use to cut greenhouse gases (GHGs) include shifting to clean energy, tightening energy efficiency standards, and building carbon credits schemes. China has been working hard on all of these fronts.

For carbon credits mechanisms, authorities began exploring and testing options in 2012. For over a decade, they sought to develop an optimal scheme suitable for its complex energy markets. Market difficulties include sharp regional differences in demand patterns due to demographic, economic, and meteorological conditions, in energy infrastructure, and in the supply resource, for example.

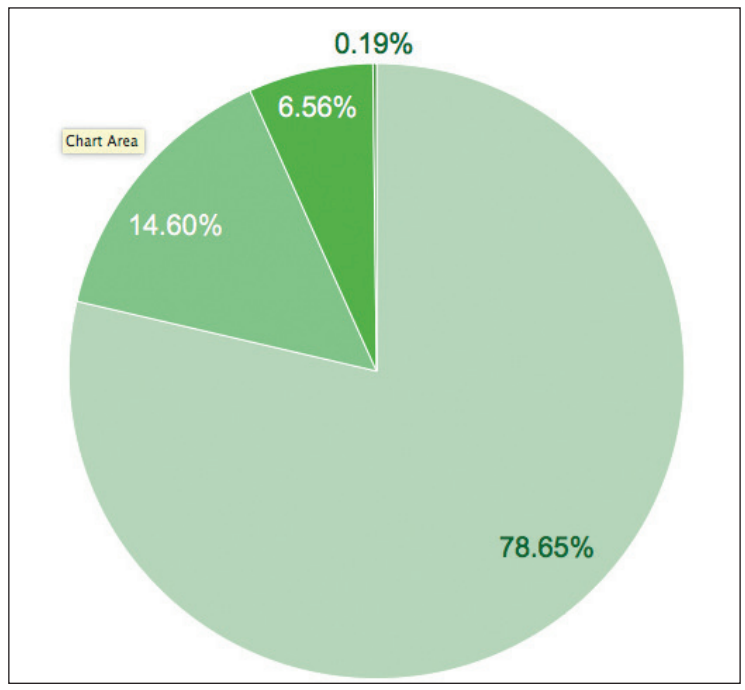
A national emissions trading scheme (ETS) was formally launched in July 2021. It included over 2000 large emitters in the electricity sector. They represent about 5 billion tonnes of annual CO_2 emissions, according to *Reuters*. Unlike other compliance carbon markets, such as the EU's, allowances are based on emissions intensity with one allowance equal to one tonne of annual CO_2 emissions. Regulatory bodies incentivise clean power generation through a cap-and-trade programme for power plants. Each plant receives an annual emissions quota. Those exceeding their limits purchase additional allowances from cleaner operating plants, creating a financial benefit to cut emissions.

When this compliance market was first launched in 2021, the expectation was that it would grow slowly, and that tweaks would come along the way. Some of the apparent stumbling blocks included data integrity and effective legislation. The nation announced that its cabinet had passed new carbon trading and data fraud regulation in February 2024, which will become effective from 1 May.

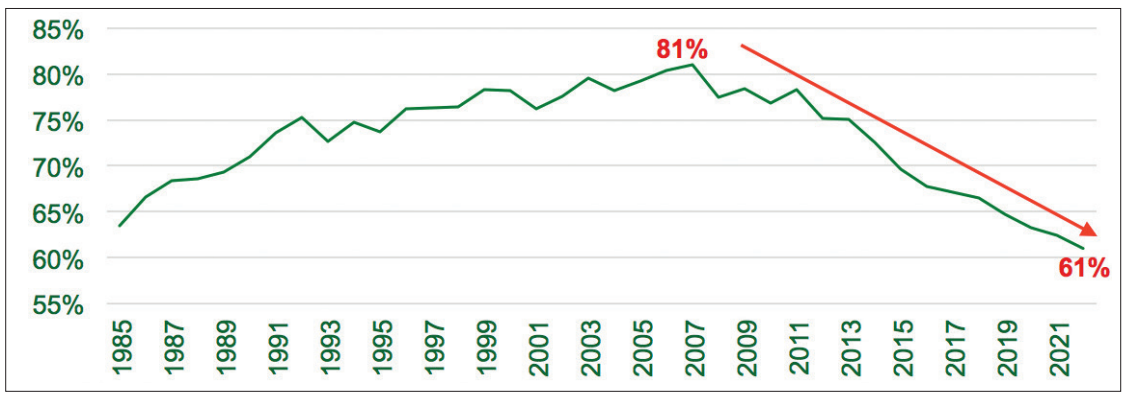
A new supervisory structure will push market participants to create data quality control plans, specify products eligible for trading, trading methods, and the distribution of quotas, said the government. It will also toughen the crackdown on fabricated data. Volume-wise, in 2023, 212 million tonnes of allowances were traded with a total transaction value of about Yuan14.44 billion ($2 billion). The average market transaction price was Yuan68.15/ton, up 23.2 per cent compared with the average in 2022. On a cumulative basis through February 2024, volume was 446.3 million tons, and value was Yuan25.3 billion ($3.5 billion). By comparison, the transaction value in 2023 of the world's most mature market, the EU ETS, was around €770 billion ($840 billion).

A voluntary carbon market, involving China Certified Emission Reduction (CCER) credits, was started in 2015, but suspended in 2017. The government blamed low transacted volumes and the lack of standardised carbon audits – the verification process of the amount of GHGs produced. Government decided to resume the market's operations in January 2024, after a revamp. Notably, trading of the CCER continued between 2015 and 2017 but at low levels while potential participants continued to maintain interest in the scheme restarting, according to law firm King & Wood Mallesons.

As of now, the methodologies accepted are for projects involving forestation, grid-connected offshore wind power, mangrove cultivation, and solar thermal power. Currently, the CCER credits traded are for projects registered before 2017, as those were never cancelled. In the first couple of weeks since the relaunch, through 31 January, 16 600 tons in carbon emission allowances for a value of Yuan1.78 million ($0.25 million) had been transacted in the Beijing Carbon Market. For the time being, the volume remains small. It is certain it will steadily rise in the coming quarters as new projects from the approved four methodologies are registered.



Carbon dioxide by energy source in 2021 in China.
Source: IEA, 'China - Countries & Regions' (IEA2023) <https://www.iea.org/countries/china/emissions> accessed 20 March 2024



China thermal coal power as a percentage of total generation.
Source: The Energy Institute, Statistical Review of World Energy (72nd | 2023, The Energy Institute 2023) <https://www.energyinst.org/statistical-review> accessed 4 September 2023

Is the nation committed to cutting emissions and to building its carbon market? Since stating its '3060 Goal' (hitting peak emissions by 2030 and carbon neutrality by 2060), China has shown its commitment to achieving its objectives. The data may not necessarily be linear, showing continued improvement for all data points. The nation faces massive challenges after all. Nonetheless, it has made huge strides in its energy shift, in its energy efficiency, and in its carbon markets. It is building renewable energy generation capacity as fast as it can: it is lowering the utilisation rates of its coal fired power plants, whose production should peak before 2030; solar and wind capacity reached 609.5 GW and 441.3 GW, up 55.2 and 20.7 per cent, respectively, in 2023; it has tightened energy efficiency regulation since 2021, and plans to cut energy intensity to 13.5 per cent below 2020 levels by 2025.

On the carbon credits front, China is fully committed to building vibrant compliance and voluntary carbon trading markets. Since its launch in 2021, the ETS continues to grow in the amount of volume and value traded. Experts, expect the ETS to expand to more than 3500 companies this year or in 2025 with the inclusion of new energy intensive sectors. Media has quoted experts stating that the Ministry of Ecology and Environment has asked seven sectors to start the annual reporting and verification of emissions. These include the building materials sector; chemicals; civil aviation; iron and steel, non-ferrous metals, such as aluminium; refining and petrochemicals; and papermaking.

So what does the future hold? China is fully committed and has a record of cutting emissions, though its record shows a non-linear improvement. The world can expect to see China adding even more renewable energy capacity, together with a declining role of coal generation. Also, ever more stringent energy efficiency regulation, and a significant increase in transaction volume of carbon credits under centralised trading can be projected.

Another two areas of development are growth in carbon-related financial products and cross border trading. As spot transactions progressively mature, 'the demand for CCER-based financing and derivatives will gradually emerge. Market participants are increasingly in need of financing tools to revitalise their carbon assets, and of derivatives to complete necessary risk management and hedging', states King & Wood Mallesons. There was a small sample trade in August 2021, when an institution and an individual from Hong Kong bought almost 10 000 tonnes worth of CCERs from a solar power project in China.

There are many investors keen to understand if China's carbon credits could be traded cross border. Administrative measures released by The Ministry of Ecology and Environment and another agency in October 2023 indicate that the detailed regulations for overseas trading and utilisation of CCERs will be independently established, implying that potential international trading of CCER rules will be released. Another positive sign in the expansion of China's carbon credits market.

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Photo courtesy: ORI Martin

Brescia steel factory pioneers decarbonisation technology

ORI Martin's steel production plant in Brescia, Italy, is a good example of how the sector can play its part in cutting global carbon emissions. **Junior Isles** recently visited the facility to take a look.

When it comes to cutting carbon emissions from steel production, Italy is arguably already ahead of the game. The majority (more than 85 per cent) of its steel is produced from electric arc furnaces using recycled scrap steel as feedstock – a much less energy and carbon intensive method than blast furnace steel production.

But for one of the country's major steel producers, this is not enough. The ORI Martin Group has completed the most recent phase of its ongoing effort to reduce emissions while improving energy efficiency across its plants. The company recently began operating a large scale heat pump in Brescia in its latest move to further improve the plant's energy efficiency and reduce carbon emissions by a further 5000 t/year.

Brescia, a historic city in the region of Lombardy between Milan and Verona, has a long history in demonstrating its commitment to sustainability and energy efficiency. In 1972 it began developing an integrated system for energy production, district heating (DH) and heat recovery from industries. Over the years the expansion of the DH network, the introduction of cogeneration plants and waste to-energy technology has seen the city gain international recognition as a good example of circularity and efficiency.

More recently, recognising the need to play its part in tackling climate change, in 2021 Brescia issued the City Charter for Climate Neutrality. It has set a target of reducing per capita CO_2 emissions by 50 per cent by 2030 compared to 2010. The target does not take into account emissions from the private production, or industrial sector.

Yet industry has a big part to play. Over the last decade or so, ORI Martin has been accelerating its activities in support of the city's sustainable development and climate-neutral ambition.

"The steel industry is one of the biggest industrial emitters of CO_2 emissions. It accounts for more than 7 per cent of the world's CO_2 emissions. We have to decarbonise to be in line with the EU's pledge to decrease emissions by at least 55 per cent by 2030, compared to 1990 levels… ," said Carolina De Miranda, Sustainability Manager, ORI Martin S.p.A. "This year we started our decarbonisation strategy to reduce our Scope 1 and Scope 2 emissions by 30 per cent by 2030, compared to 2018. And we would like to use up to 25 per cent renewable energy in our process."

Commenting on the Brescia site specifically, she added: "We are located next to a residential area, which has always pushed us to work on sustainability. So we started to work on sustainability a long time ago, especially for this location. "

The Brescia site has been a key focus for the company. In 2016 it began working with Turboden, a Mitsubishi Heavy Industries company, to see how the steel plant could contribute to the city's drive to improve energy efficiency. It invested €12 million in a project called 'I-Recovery' to convey the large amount of heat contained in the fumes of the electric arc furnace into a system to avoid it being wasted to the atmosphere.

The heat is recovered by a waste heat recovery steam generator that generates steam, which is then used to feed the district heating network in winter, or converted into electricity in the summer months through a 2.5 MW Turboden turbine using an Organic Rankine Cycle (ORC). Both the heat and electricity are supplied to local energy company A2A to serve its customers. The system has an annual heat recovery capacity of 52 GWh and has reduced CO_2 emissions by 10 000 t/year.

In its ongoing mission to cut carbon emissions and improve energy efficiency still further, ORI Martin again turned to Turboden to recover even more heat from the process. A project known as 'Heat Leap' was launched in 2020 as part of the 'Life' programme funded by the EU. Operation of this €6.5 million project started earlier this year.

Roberto de Miranda, Board Member, ORI Martin, said: "We use a lot of water in the process for cooling. Normally we use a cooling tower to cool down the water used to cool the electrical furnace. Now we can send the water to a large heat pump (LHP) to recover even more heat."

Thanks to the installation of the LHP, the heat from the furnace cooling water can be upgraded and then re-utilised instead of being wasted, i.e. dissipated through cooling towers.

For this project, Turboden designed and installed an innovative LHP system. With a Coefficient-of-Performance (COP) of 8.2, it elevates the waste heat (using electrical energy) coming from the low-temperature thermal waste heat of the steel plant, from about 70°C up to as much as 120°C, to transfer it to the local district heating network. Turboden's LHP has a thermal output of up to 7 MWth and is capable of adapting its operation to specific process conditions, thereby maximising energy recovery from the steel plant.

It will also be able to regulate the heat transfer temperature according to the specific needs of the district heating network, up to a maximum of 120°C. According to the company, this is an important innovation compared to the maximum temperatures achievable by conventional heat pump technology.

It was a complex project. The overall architecture of the installation was carefully studied before proceeding to any real work on site. Overall installation drawings were done, as well as detailed engineering and computer-assisted design, especially on the different interfaces between sub-systems. Firstly, the LHP was connected to the existing waste heat recovery (WHR) system and designed in such a way that it can accommodate variations of the heat source temperature, thus providing constant temperature to the WHR installed downstream.

The LHP was assembled on site, accounting for local constraints and final fine-tuning of connecting pipes. The LHP was then thermally insulated to avoid heat losses, as well as to ensure safe access for authorised maintenance staff.

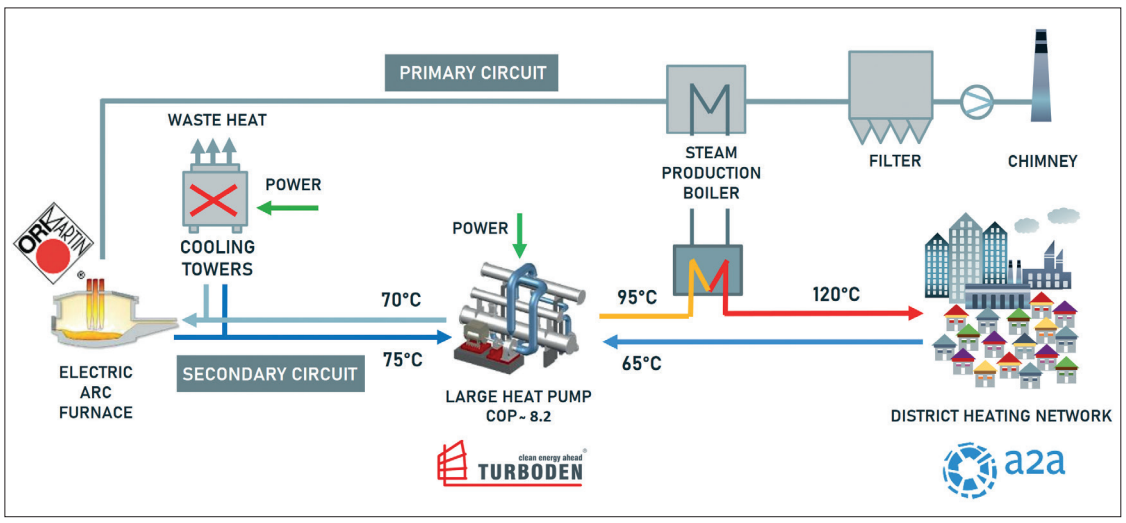
The LHP was installed sufficiently close to the WHR system to minimise temperature drops, and all connecting pipes were thermally insulated. Assembly was carried out on-site. In addition to mechanical and hydraulic works, the LHP installation included electrical works.

The heat pump at the steel works can be split into its main different components: a low-pressure compressor skid, where the inlet pressure is between 4 and 7 bar; a high-pressure compressor skid, where the outlet pressure is between 7 and 10 bar; a condenser; and an evaporator.

Roberto Bertanzi, Product Development Coordinator at Turboden said: "The water needed to cool the furnace used to be wasted but thanks to the heat pump, it can be now heated from about 70°C to around 100°C for feeding into the district heating system. It works in parallel with the system that recovers heat from the furnace fumes." He added: "It's quite a flexible system; we use software to optimise heat production in summer and winter. This is a pioneering project."

Bertanzi noted the growing use of heat pumps throughout various industries due to their ability to provide both heating and cooling as well as the pressing need for decarbonisation. "They are, for example, needed in the food industry and dairies," he said. "They are also well suited for carbon capture processes, which need both heating and cooling for the chemical processes used to remove CO_2."

He concluded: "The heat pump helps support decarbonisation of heat. So every time you are producing heat, you have to ask: 'Can I recover heat somewhere else by using a heat pump to reach my target temperature?' It's not just about saving money; it's about saving the environment."



Maximising heat recovery at the ORI Martin steelworks in Brescia, Italy

Junior Isles

Fossil fired generation is not running out of gas... yet

Environmentalists and staunch renewable energy supporters were up in arms over the UK's recent decision to commit to more gas fired plant. But whatever your stance – rightly or wrongly – gas will continue to play an important role in global power markets for the foreseeable future.

Last month Britain's government committed to supporting the building of new gas power stations to "maintain a safe and reliable energy source for days when the weather forecast doesn't power up renewables".

In a statement, the Energy Secretary called it a "common-sense decision to shore up the UK's energy supply" as the nation transitions to net zero. The statement from the Department for Energy Security and Net Zero said it is the latest step in efforts to reach net zero in a sustainable, pragmatic way that "rids the UK of the need to rely on foreign dictators like [Russian President Vladimir] Putin".

Energy Security Secretary, Claire Coutinho, added: "There are no two ways about it. Without gas backing up renewables, we face the genuine prospect of blackouts. Other countries in recent years have been so threatened by supply constraints that they have been forced back to coal.

"There are no easy solutions in energy, only trade-offs. If countries are forced to choose between clean energy and keeping citizens safe and warm, believe me they'll choose to keep the lights on."

This may well be true but is new gas plant really the best, or only way to go?

Some analysts warned extra gas is the wrong solution to the question of how to meet increasing demand and provide flexibility, and said the UK's decision was a reflection of failure in other areas of energy security policy.

Juliet Phillips, UK energy programme lead at think-tank E3G, said the UK has been a clean power leader, given its continued exponential growth in renewables. She said, however, that the government's "policy failures" and "missed opportunities" in offshore wind and grid connections left it having to announce new gas power.

Further, the government's energy security standpoint is, arguably, misplaced.

Christophe Williams, CEO of Naked Energy said: "It is a mistake to believe that relying on fossil fuels will lead to cheaper bills and energy security. The North Sea's gas is running out, and when it does we will be at the mercy of foreign imports and the price volatility that comes with it. Considering that none of the CO_2 from this gas will be captured, it's a lose-lose for customers – their bills and our emissions will go up."

This was echoed by Greenpeace, which said the plan would make the country "more dependent on the very fossil fuel that sent bills rocketing and the planet's temperature soaring".

Notably, just a week after the UK's announcement, the UN's World Meteorological Organization (WMO) that affirmed that 2023 was the hottest year on record. Its report said that records were broken "and in some cases smashed" in 2023 for greenhouse gas levels, ocean heat and acidification, sea level rise, Antarctic sea ice cover and glacier retreat.

And let us not forget the not so small issue of: who will invest in these new gas projects?

To date, investors have been wary about financing new UK fossil fuel projects through the government's capacity market, a kind of reverse auction that offers 15-year contracts to build new energy projects. Investors typically invest in gas plants over a 30-year time frame, which has made the capacity market a risky prospect.

"What we have is a falling installed capacity base set against rising demand for electricity," Tom Smout, a senior associate at Aurora Energy told *the Guardian*. "The reality is that the government's capacity market has brought in only one new gas plant because investors are wary about putting money into a plant that doesn't do very much for very long and then becomes a stranded asset."

The Climate Change Committee (CCC) has said that a "small amount" of gas generation without carbon capture is compatible with a decarbonised power system, but experts argue that might only be two per cent of the market (equivalent to only 15 hours of electricity a month).

Williams said: "As renewable energy takes more of the market share, why would any private sector company invest in natural gas? Two per cent of the market is far too small a portion to encourage investment, unless it comes with significant state-backed subsidies."

He added: "It makes far more fiscal sense to invest in modernising the power grid, expand wind farms on our shores and shred the red tape that is slowing down the deployment of renewable technologies. At the end of the day, this is the only way to boost our energy security and achieve our net zero targets – it's really as simple as that."

It is hard to disagree. Battery storage is ideal for covering the short-term periods when wind and solar are unable to generate. Certainly there has been no shortage of investors.

In a significant statement of confidence, last month NatPower UK, part of global energy transition developer NatPower Group, announced that it is going to drive a multi-billion investment to deliver the country's largest portfolio of battery storage, totalling over 60 GWh. It said large-scale solar and wind projects will follow later this year to support the UK's effort to deliver 100 per cent renewable power by 2035.

The company has a large-scale nationwide battery storage roll-out planned, with the first three 'GigaParks' going for planning permission in 2024 and 10 more in 2025.

According to recent analysis by Aurora, Britain, Ireland and Italy are the most attractive markets for investors in battery power storage, with Spain, Germany and Greece also "showing promising signs". Forecasting a seven-fold increase in European battery power storage capacity by 2030, Aurora said this translates into an investment opportunity of over €30 billion, rising to almost €80 billion by 2050.

That said, the need to cover extended periods of days or months of low renewables output must also be considered. With hydrogen still some way off, this is where many believe gas fired plants come in.

Commenting on the UK's plan to boost gas fired generating capacity, Dan Monzani, Managing Director UK & Ireland at Aurora Energy Research, said: "We need to double down on firm low carbon technologies, like nuclear, carbon capture and long-duration storage but we also need to invest in maintaining reserve gas capacity. In a net zero system in 2035, we will need to run gas 90 per cent less often but we still need to maintain two-thirds of the current gas capacity to ensure our energy needs are met at all times."

Earlier this year in its 'Gas Market Report, Q1-2024', the International Energy Agency (IEA) said natural gas markets are expected to see a return to strong growth in 2024, primarily driven by the industrial and power sectors in fast-growing economies in Asia and gas-rich countries in Africa and the Middle East.

It cautioned, however, that the continued expansion of renewables and improving nuclear availability are likely to temper requirements for gas fired power generation in mature markets.

With an election due next year and questions remaining around the attractiveness of new gas fired investment we will have to wait and see if the UK follows through with its plan. But perhaps with there still being a role for backup plants in mature markets, and an appetite for gas in many parts of the world, any declarations of the imminent demise of gas fired generation are greatly exaggerated.

Cartoon: jemsoar.com