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Covid-19 drives record lows in energy demand and carbon emissions

Dr Birol: "this is a historic shock"

The coronavirus pandemic has caused the biggest fall in energy demand in 70 years, with only renewables showing any kind of resilience. One positive outcome, however, is carbon dioxide emissions have seen a record annual decline. **Junior Isles**

A new report by the International Energy Agency (IEA) has provided an almost real-time view of the Covid-19 pandemic's extraordinary impact across all major fuels.

Its stark findings have revealed that the Covid-19 pandemic represents the biggest shock to the global energy system in more than seven decades. The drop in demand this year is set to dwarf the impact of the 2008 global financial crisis, resulting in a record annual decline in carbon emissions.

"This is a historic shock to the entire energy world. Amid today's unparalleled health and economic crises, the plunge in demand for nearly all major fuels is staggering, especially for coal, oil and gas. Only renewables are holding up during the previously unheard-of slump in electricity use," said Dr Fatih Birol, the IEA Executive Director. "It is still too early to determine the longer-term impacts, but the energy industry that emerges from this crisis will be significantly different from the one that came before."

Based on an analysis of more than 100 days of real data so far this year, the IEA's Global Energy Review includes estimates for how energy consumption and carbon dioxide (CO_2) emissions trends are likely to evolve over the rest of 2020. Its projections are based on assumptions that the lockdowns implemented around the world in response to the pandemic are progressively eased in most countries in the coming months, accompanied by a gradual economic recovery.

The report forecasts that energy demand will fall 6 per cent in 2020 – seven times the reduction seen after the financial crisis. In absolute terms, the IEA says the decline is unprecedented – the equivalent of losing the entire energy demand of India, the world's third largest energy consumer.

Advanced economies are expected to see the biggest declines, with demand set to fall by 9 per cent in the US and by 11 per cent in the EU. The impact of the crisis on energy demand largely depends on the length and stringency of measures to curb the spread of the virus. For example, the IEA found that each month of worldwide lockdown at the levels seen in early April reduces annual global energy demand by about 1.5 per cent.

Electricity demand is set to fall by 5 per cent in 2020, the largest drop since the Great Depression in the 1930s. Demand for electricity from coal and natural gas has been hit hardest, as they are increasingly squeezed between low overall power demand and increasing output from renewables. As a result, the combined share of gas and coal in the global power mix is set to drop by 3 percentage points in 2020

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Asian banks shy away from coal

Wespac has become the latest Asian financial institution to announce plans to halt coal investments in a region that is still largely dependent on coal fired generation.

At the start of May Australia's second largest bank said it will offload its thermal coal investments over the coming decade, as it looks to align both its investments and its operations with a net zero emissions goal.

As part of an updated climate change position statement for 2023, Westpac said that it would look to wind down its investments in the thermal coal sector, as well as setting a target of up to $3.5 billion in lending to climate-friendly investments over the next three years.

Westpac has also adopted emissions intensity targets for its electricity generation portfolio that will effectively prevent the bank from investing in any new or existing coal fired power stations, as well as putting pressure on any investments in gas projects.

Already a trend among global banks from Europe, Africa, Australia, the UK and the US, the decision by Westpac is now also a growing trend for Asian banks.

In April, Japan's two largest institutional banks – Japan Bank for International Cooperation (JBIC) and Sumitomo Mitsui Financial Group – announced that they would stop financing new coal fired power plants. The decision came after rival Mizuho Financial Group Inc. said it would stop financing coal power plant construction. Mitsubishi UFJ Financial Group Inc. already stopped such financing last year.

Tim Buckley, Director Energy Finance Studies, Asia Pacific at the Institute for Energy Economics and Financial Analysis (IEEFA), said a domino effect across other coal lending financiers in Asia is likely.

"Mizuho is the world's largest private financier of coal developers, which means other financial lenders keep a close eye on its activities. Now that they've announced a coal exit which indicates to the market that coal is a very poor investment, we expect other lenders to also announce a policy shift away from coal."

The Japanese giants have joined Singapore's United Overseas Bank, DBS Bank, and Overseas Chinese Banking Corp. in halting the financing of new coal power projects. Japanese trading houses, such as Marubeni Corp., Mitsubishi Materials, Mitsui and Itochu, are also divesting away from coal.

South Korea, meanwhile, is targeting zero emissions by 2050 as it introduces an effective carbon tax and the phase out of domestic and overseas coal financing by public institutions.

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to a level not seen since 2001.

Coal is particularly hard hit, with global demand projected to fall by 8 per cent in 2020, the largest decline since the Second World War. Following its 2018 peak, coal fired power generation is set to fall by more than 10 per cent this year.

After 10 years of uninterrupted growth, natural gas demand is on track to decline 5 per cent in 2020.

Renewables are set to be the only energy source that will grow in 2020, with their share of global electricity generation projected to jump thanks to their priority access to grids and low operating costs. Despite supply chain disruptions that have paused or delayed deployment in several key regions this year, solar PV and wind are on track to help lift renewable electricity generation by 5 per cent in 2020, aided by higher output from hydropower.

Despite the resilience of renewables in electricity generation in 2020, their growth is set to be lower than in previous years. Nuclear power, a major source of low-carbon electricity, is on track to drop by 3 per cent this year from the all-time high it reached in 2019. And renewables outside the power sector are faring less well. Global demand for biofuels is set to fall substantially in 2020 as restrictions on transport and travel reduce road transport fuel demand, including for blended fuels.

Hardest hit: coal fired generation is expected to fall by 10 per cent this year

As a result of these trends – mainly the declines in coal and oil use – global energy-related CO_2 emissions are set to fall by almost 8 per cent in 2020, reaching their lowest level since 2010. This would be the largest decrease in emissions ever recorded – nearly six times larger than the previous record drop of 400 million tonnes in 2009 that resulted from the global financial crisis.

A separate report by Germany-based Climate Action Tracker (CAT) estimates that the pandemic would cause global CO_2 emissions from fossil fuels and industry to fall by 4-11 per cent in 2020. The German non-profit organisation observed that global emissions could possibly continue to decline in 2021 by around 1-9 per cent below 2019 levels.

Dr Birol said, however that the historic decline was "nothing to cheer", as the pandemic caused "premature deaths and economic trauma" around the world. He added: "And if the aftermath of the 2008 financial crisis is anything to go by, we are likely to soon see a sharp rebound in emissions as economic conditions improve.

"But governments can learn from that experience by putting clean energy technologies – renewables, efficiency, batteries, hydrogen and carbon capture – at the heart of their plans for economic recovery. Investing in those areas can create jobs, make economies more competitive and steer the world towards a more resilient and cleaner energy future."

Renewable energy can support resilient and equitable recovery

- Renewables would deliver GDP gains of $98 trillion
- Carbon dioxide emissions would fall by 70 per cent by 2050

Advancing the renewables-based energy transformation is an opportunity to meet international climate goals while boosting economic growth, creating millions of jobs and improving human welfare by 2050, finds the first 'Global Renewables Outlook' released by the International Renewable Energy Agency (Irena).

While a pathway to deeper decarbonisation requires total energy investment up to $130 trillion, the socio-economic gains of such an investment would be massive, the Outlook claims.

The agency's report found that accelerating investment in renewable energy would help tackle the climate crisis and would in effect pay for itself. Investing in renewable energy would deliver global GDP gains of $98 trillion above a business-as-usual scenario by 2050 by returning between $3 and $8 on every dollar invested, says the report.

It would also quadruple the number of jobs in the renewables sector to 42 million over the next 30 years, and measurably improve global health and welfare scores, according to the report.

Irena's Director-General Francesco La Camera said: "Governments are facing a difficult task of bringing the health emergency under control while introducing major stimulus and recovery measures.

"By accelerating renewables and making the energy transition an integral part of the wider recovery, governments can achieve multiple economic and social objectives in the pursuit of a resilient future that leaves nobody behind."

Notably, in early May the UK's Committee on Climate Change (CCC) called on the government to "use climate investments to support economic recovery and jobs".

The Irena report says that renewable energy could curb the rise in global temperatures by helping to reduce the energy industry's carbon dioxide emissions by 70 per cent by 2050 by replacing fossil fuels.

The economic case is also strong. Solar PV and onshore wind are already the cheapest sources of new build generation for at least two-thirds of the global population, according to research company BloombergNEF.

Its latest analysis shows that the global benchmark levelised cost of electricity (LCOE), for onshore wind and utility-scale PV, has fallen 9 per cent and 4 per cent since the second half of 2019 – to $44 and $50/MWh, respectively. Meanwhile, the benchmark LCOE for battery storage has tumbled to $150/MWh, about half of what it was two years ago.

BNEF further estimates that some of the cheapest PV projects financed in the last six months will be able to achieve an LCOE of $23-29/MWh, assuming competitive returns to their equity investors. Those projects can be found in Australia, China, Chile, and the United Arab Emirates.

Falling costs saw wind and solar dominate capacity additions last year. Irena's Renewable Capacity Statistics 2020 show the technologies accounted for 90 per cent of all net renewable additions in 2019.

Solar, with 586 GW, increased by 20 per cent, while wind, with 623 GW, increased by 10 per cent. All renewables – principally hydropower, wind, solar, geothermal, and bioenergy – accounted for 72 per cent of all power expansion last year.

Power sector reels from impacts of Covid-19

The coronavirus crisis is continuing to expose a number of weaknesses and risks across the value chain of the global power sector and clean energy technologies.

In a recent analysis the Wood Mackenzie Energy Transition Practice outlined the impact the Covid-19 pandemic is having on wind, solar, energy storage and electric vehicles across power markets including Europe, North America, Latin America and Asia.

According to the research firm, technology value chains have varying levels of exposure to supply side constraints and demand erosion.

In the wind power market, widespread pandemic containment measures have depleted the supply chain's ability to shift capacity to maintain output, reducing 2020 global production capacity by 15-20 per cent. Wind turbine blades represent a particularly challenged sourcing component, as both key manufacturing and raw materials markets are currently under restrictions.

Looking at offshore wind specifically, it says downside risk is minimal as China restarts, US projects are still too immature and Europe was already set for slowdown in installations and contracting. Emerging offshore markets and earlier stage projects could face delays in financial close as a result of economic instability and currency risks.

In the solar market Wood Mackenzie notes that installations have been revised down by 17 per cent from pre-coronavirus levels from 130.5 GW to 108.0 GW. In the absence of prolonged recession or profound changes to financing and utility procurement, 2021 will recover to be 3 per cent below pre-coronavirus expected levels. While the utility-scale impact will primarily see timelines shift, residential and business installations will struggle as customers come under significant economic pressure even past the lockdown. It also noted that module prices in Europe and the US are starting to decline as demand impacts materialise, with the US seeing its first price decline in the first week of April.

The outbreak will also significantly slow storage deployment. Installations for 2020 are now forecast to be 20 per cent lower than the 2020 base case, with the risk stemming largely from project execution delays. Positive growth over 2019 is expected in both scenarios, as well as a return to pre-coronavirus impact levels in 2021. Like solar, the distributed storage risk is more acute.

Grid edge technologies will be less affected. Coronavirus mitigation measures could even provide a good test opportunity for grid edge technologies that support improved diagnostics and remote operations. This could catalyse further investments. Long utility sales cycle times are expected to mitigate the negative impacts of coronavirus on investment plans.

In a separate commentary, International Energy Agency analysts also warned that the security of supply of key minerals – including copper, cobalt, lithium, molybdenum – used in renewable power and electric vehicles cannot be taken for granted. It said supply chain constraints, complicated by geopolitical risks, could hit post-crisis growth of clean technologies.

Hydrogen has key role in cutting "toughest third" of global CO_2 emissions

Clean hydrogen can help address the toughest third of global greenhouse gas emissions by 2050, but only if net-zero emission goals and policies are set, according to a new study by research firm BloombergNEF (BNEF).

BNEF's 'Hydrogen Economy Outlook', a new and independent global study from research firm BloombergNEF (BNEF), finds that clean hydrogen could be deployed in the decades to come to cut up to 34 per cent of global greenhouse gas emissions from fossil fuels and industry – at a manageable cost. However, this will only be possible if policies are put in place to help scale up technology, and drive down costs.

The report's findings suggest that renewable hydrogen could be produced for $0.8 to $1.6/kg in most parts of the world before 2050. This is equivalent to gas priced at $6-12/MMBtu, making it competitive with current natural gas prices in Brazil, China, India, Germany and Scandinavia on an energy-equivalent basis. When including the cost of storage and pipeline infrastructure, the delivered cost of renewable hydrogen in China, India and Western Europe could fall to around $2/kg ($15/MMBtu) in 2030 and $1/kg ($7.4/MMBtu) in 2050.

The falling cost of making hydrogen from wind and solar power offers a promising route to cutting emissions in some of the most fossil fuel dependent sectors – a possibility that is gaining traction globally, as equipment manufacturers, industry players and government work together to advance projects.

Last month Dutch utility Eneco said it is joining the PosHYdon demo scheme for the offshore production of hydrogen in the North Sea. The PosHYdon project, touted as the first of its kind, involves the installation of a hydrogen production unit on a gas production platform, where desalinated seawater and power produced by offshore wind turbines will be used to make hydrogen.

Also in April, French multinational power utility Engie joined a consortium to deliver a project aiming to decarbonise a bio-refinery in Rotterdam. The project, named Multiplhy, is claimed to be the first multi-megawatt high-temperature electrolyser that generates renewable hydrogen to produce biofuels.

The UK, meanwhile, made progress last month in advancing its efforts to use hydrogen in a project aimed at cutting industrial emissions.

ITM Power and Element Energy will study the feasibility of a gigawatt-scale renewable hydrogen project in Humberside, the UK's largest cluster by industrial emissions. The companies announced that they have won a first stage deployment project in the "Decarbonisation of Industrial Clusters" competition, organised by the Industrial Strategy Challenge Fund.

As part of the "Green Hydrogen for Humberside" project, ITM and Element will gather information from industrial energy users to assess the feasibility of switching to renewable hydrogen and justify the deployment of a number of 100 MW electrolyser sites.

Australia has also been pouring money into developing its hydrogen sector. At the start of May the Morrison Government said it will change the investment mandate of the Clean Energy Finance Corporation (CEFC), directing it to make up to $300 million available for a new Advancing Hydrogen Fund as part of the national hydrogen strategy.

China meanwhile has started building what it claims will be the world's largest solar-powered hydrogen plant. Coal miner Baofeng Energy has kicked off a RMB1.4 billion ($199 million) electrolysis project that will feature two 10 000 m^3/h electrolysers powered by two 100 MW solar plants to produce 160 million m^3/ year of hydrogen plus 80 million m^3 of oxygen.

Lawmakers challenge Trump's ACE rule

Lawmakers in a number of states in the US are preparing to challenge the US government on plans to roll back the Clean Power Plant rule. The challenge comes as the Trump administration abandons regulations on mercury emissions.

Junior Isles

More than 70 Democratic lawmakers from both chambers have joined a suit challenging the US government's Affordable Clean Energy (ACE) rule.

The rule, finalised by the Environmental Protection Agency (EPA) last August, is an attempt by the Trump administration to scrap former President Obama's Clean Power Plant rule. The ACE rule aims to give states more time and authority to decide how to implement the best new technology to ease net emissions from coal fired plants. The rule does not set any standards to cap those emissions.

Critics argue ACE allows for only modest pollution controls at power plants, a feature that, if upheld, could hamstring future administrations from addressing climate-altering pollution through regulation under the Clean Air Act.

The Trump EPA has long argued the Clean Power Plant rule was too broad, creating an undue burden on industry.

"CPP's overreach would have driven up energy prices for consumers and businesses alike," EPA Administrator Andrew Wheeler said when the rule was first released. "We are proposing a better plan – it respects the rule of law and will enable states to build affordable, clean, reliable energy portfolios."

But a brief from senators argued the EPA has been too aligned with industry interests since the start of the Trump administration.

"The record of this case, and of other regulatory matters of which this court may take notice, indeed raise the question whether this EPA is even capable of fair decision-making in matters involving the interests of the fossil fuel industry, or whether rampant cronyism, conflicts of interest, and corruption leave the EPA under present leadership unable to conform itself to the strictures of [federal administrative law]," according to the filing from Senators Sheldon Whitehouse (D-R.I.), Ed Markey (D-Mass.), Jeff Merkley (D-Ore.), Brian Schatz (D-Hawaii), and Kirsten Gillibrand (D-N.Y.).

Environmental groups have also challenged the ACE rule. The consensus is the standards are far too limited and could prevent future governments from reducing global warming emissions.

"The Rule is a blatant abdication of EPA's statutory duty to protect the public from air pollution that the agency itself has repeatedly found poses grave and imminent dangers to health and welfare," environmental groups wrote in their brief, part of a coalition between the Environmental Defense Fund, Natural Resources Defense Council (NRDC), Sierra Club and others.

Notably, in April the EPA ruled that it was now no longer "appropriate and necessary" to regulate coal fired power plants in the US to stop them emitting mercury and other hazardous air pollutants.

During his election campaign President Trump promised a return of the coal industry but coal fired generation continues to decline due to competition from cheaper gas and a growth in renewables. In 2010, coal was the predominant source of electricity generation in the United States as a whole and in every region except the Northeast. In 2019, coal was the most used electricity generation source in only the Midwest.

In the Northeast region, access to abundant natural gas supply from the Marcellus and Utica shale plays in Pennsylvania and Ohio has led to increases in natural gas fired power plant capacity.

Similarly, access to high quality wind resources in the Midwest region has led to increases in wind capacity. In both cases, these additions have replaced coal fired capacity.

According to the US Energy Information Energy Information Administration's (EIA) nearly 14 000 MW of coal fired capacity was retired in 2019. This is the third highest recorded figure for annual coal retirements in the EIA's power plant inventory.

More US states turning to offshore wind

An increasing number of US states are focusing on offshore wind to meet capacity needs.

Last month the New York Public Service Commission (PSC) authorised the state's plan to procure up to 2.5 GW of offshore wind power capacity, starting with a 1 GW round in 2020. The planned sale will be the largest solicitation for offshore wind in the US to date and will support New York's plan to achieve zero greenhouse gas emissions (GHG) from power generation by 2040.

The new procurement rounds will build on successful tenders that will facilitate the installation of almost 1.7 GW of fresh offshore wind capacity off the state's coast, which are planned to go live by 2024.

Earlier in the month an even more ambitious plan was announced in Virginia. The state's Governor Ralph Northam signed the Clean Economy Act, which requires at least 5.2 GW of offshore wind power to be developed by 2034.

The act requires nearly all coal fired plants to close by the end of 2024, with electricity to come from 100 per cent renewable sources, and Dominion Energy to be 100 per cent carbon-free by 2045.

Energy companies must pay penalties for not meeting their targets, and part of that revenue would fund job training and renewable energy programmes in historically disadvantaged communities.

Dominion Energy and Ørsted are currently developing Virginia's first offshore wind project – the 12 MW Coastal Virginia Offshore Wind demonstration wind farm.

The two-turbine project is expected to provide the operational, weather, and environmental experience needed for large-scale development in Dominion Energy's adjacent 112 800 ha lease site, which has the capacity to generate up to 2 GW of offshore wind.

Argentine renewable capacity under threat

Argentina's wholesale electricity market administrator, Cammesa, is renegotiating the terms of 25 renewable projects awarded in the three first rounds of renewable tender framework RenovAr.

The projects, worth some $1.7 billion in total and which were expected to add 1.3 GW of renewable capacity, according to the BNamericas project database, have seen delays in their schedules. The authorities will have to decide whether the projects will be awarded extensions or have their supply contracts suspended.

Four projects – two solar parks and two small biomass plants – have already been suspended.

Financial and economic conditions deteriorated rapidly in the country after the peso crash of 2018 that prompted a $57 billion bailout by the International Monetary Fund. Many RenovAr projects reported delays after that crisis, which was followed by an even deeper run on the peso last August.

Project developers have faced difficulty securing affordable financing for their contracted projects, and Argentina's ongoing debt negotiations have only tightened local and international financial markets.

Coronavirus pandemic delays Brazil privatisation

Brazil has pushed back the planned privatisation of the state-owned power company Eletrobras until 2021 as politicians focus on controlling the spread of the coronavirus.

The company was due to be privatised this year but the economic impact from the coronavirus outbreak means bidders may have to recalculate its value. Currently, the value of the company is based on several factors, including price charged by Eletrobras, the discount rate and the level of hydrological risk to energy production

"Two of these may be affected by the crisis. One is the price of the energy, which may now be lower, and the second is the discount rate because that takes into account interest rates in Brazil and US Treasury bonds, which are lower now," said Ricardo Brandão Silva, a board member at Eletrobras.

Eletrobras will take steps to protect its bottom line in the face of a weakening economy. Later this year, the company will refinance debt that matures in 2021 and reappraise a five-year investment plan that was due to start in 2020, CEO Wilson Ferreira Júnior said during a conference call with analysts.

According to its Business and Management Master Plan 2020-2024, Eletrobras plans to invest BRL32.4 billion ($5.53 billion) over the period 2020-2024. Around 65 per cent of this amount will be invested in power generation, including BRL13.9 billion in the Angra 3 nuclear power project (nearly 43 per cent of total investments). In addition, Eletrobras will invest BRL9.4 billion in electricity transmission, and BRL1.8 billion in infrastructure and environmental works. The plan was prepared before the Covid-19 epidemic in Brazil.

In mid-April the pandemic led Brazil's Ministry of Mines and Energy (MEM) to indefinitely postpone the national energy generation and transmission auctions. Specifically, the government has postponed six events: both the new and existing energy auctions dubbed A-4 and A-6, as well as tenders for transmission lines and those aimed at supplying isolated systems. Before the pandemic, the nation's three-year plan comprised an A-4 auction in the first half of 2019, 2020 and 2021, followed by an A-6 auction in the second half.

Somik Das, Power Analyst at GlobalData, said: "The government stressed that it is not cancelling the 2020 auctions, only postponing until the pandemic subsides. This stress from the government hints that it would ensure minimum impact of the pandemic on the electricity sector and the auctions would be held at the earliest once normalcy is restored."

The new A-4 energy auction, initially scheduled for May 28, was the only one concerning renewable power. It registered 51 438 MW of hydro, wind, solar and biomass energy projects to compete in the bidding process.

In late April the government allowed 10 wind parks, totalling 467.5 MW, to enter the national Incentive Regime for Infrastructure Development scheme (REIDI). Launched in 2007, the scheme grants tax incentives to companies investing in infrastructure projects within the transport, energy, sanitation and irrigation sectors.

■ A corporate venture unit of Norwegian company Equinor has taken a stake in Brazil-based battery storage systems and solar distributed generation company Micropower Comerc Energia SA (MPC). The target has plans to develop energy storage for large wind and solar energy generation projects in Brazil.

Coal will remain key, despite financing issues

Despite increasing difficulties in securing financing, coal fired power generation is expected to continue to play a key role in Asia's economic expansion. **Syed Ali**

Coal is expected to remain a key power generation source in multiple emerging markets across Asia over the coming decade, despite Japan's increasing shift away from financing coal projects.

According to Fitch Solutions Country Risk & Industry Research, coal remains the most practical means to stimulate affordable electricity generation growth at the pace and scale needed by many emerging markets, particularly as power demand is expected to surge.

In a research note it said: "We expect coal to remain a key power generation source in multiple emerging markets across the globe over the coming decade, despite Japan's increasing shift away from financing the fuel source. We note that Japan remains one of the largest coal financiers across the globe, particularly in Asia."

Following increasing global criticism, the Japanese environmental minister had promised earlier in 2020 to review Japan's coal financing and export policies by end of June 2020.

In April 2020, several major Japanese banks, including Mizuho, Sumitomo Mitsui, and Mitsubishi UFJ (MUFG) announced new tighter coal financing policies, which presents some downside risks to existing coal projects in the pipeline. The Japan Bank of International Cooperation (JBIC), one of Japan's largest coal financing public institutions reportedly also announced that it will no longer offer loans for coal projects.

Fitch Solutions believes, however, that there will still be continued access to financing sources. "We believe that a key factor for coal fired power growth is the continued access to financing sources. While the aforementioned banks have signalled intentions to exit coal, their existing policies have granted very broad exemptions with loopholes, which could be leveraged on to obtain funding for certain coal projects.

"For example, all three banks have granted exceptions to projects which have already been 'committed' before their new policies take effect, although the definition of this remains vague. All three banks have also granted exceptions to coal projects that use more effective technologies, as well as in certain 'circumstances of host countries'. As such, financing toward more efficient coal powered projects might still be justified in markets with surging power demand growth and threats of power shortages."

Further, even if financing from Japan weakens Fitch Solutions believes that funding from Chinese and South Korean banks will remain largely forthcoming, particularly as both markets aim to generate external demand for coal power equipment through the use of their respective export credit agencies. This is amid domestic declines in coal fired power generation hitting access to growth opportunities in their domestic power markets.

The company stresses, however, that coal will see a decline over the longer term, with the current batch of projects likely to be among the last wave, as the sector faces systemic risks beyond the next decade. It cited Vietnam and Indonesia as two countries that have significant coal project development in the pipeline, in spite of plans to grow renewables.

"We believe that the growing environmental consciousness will lead to a gradual shift away from coal power," said the research note.

Based on a survey of 90 senior decision-makers within the utilities industry across five countries – both in developed and emerging markets – Fitch Solutions found that a majority of respondents cited 'climate change and environmental considerations' as the highest disruptors to the industry over the coming decades.

Australia supports hydrogen

The Liberal National Government is backing Australia to become a world leader in hydrogen production and exports by establishing the Advancing Hydrogen Fund.

A new $300 million fund created by the government will finance projects focused on growing a clean, innovative and competitive hydrogen industry in Australia. It is the government's first financing fund dedicated to hydrogen projects.

The fund will back projects that align with priorities under the National Hydrogen Strategy. This includes areas such as advancing hydrogen production, developing export and domestic supply chains, establishing hydrogen hubs and backing projects that build domestic demand for hydrogen.

The Advancing Hydrogen Fund will be administered by the Clean Energy Finance Corporation (CEFC) and will provide concessional finance for projects that will support a national hydrogen industry.

Finance Minister Mathias Cormann said the government is drawing on the energy and financial markets expertise of the CEFC, which has invested more than $7.7 billion in clean energy so far, to help drive investment in hydrogen.

The government has set an economic goal for hydrogen of 'H2 under 2' – that is hydrogen at or under $2/kg – the first technology goal in the Technology Investment Roadmap. That is the point where hydrogen becomes competitive with alternative energy sources in large-scale deployment across Australia's energy systems. This goal is essential to drive down the cost of new technologies, and the Advancing Hydrogen Fund will help to achieve this price point.

Energy and Emissions Reduction Minister Angus Taylor said: "Importantly, if we can get hydrogen produced at under $2 a kilogram, it will be able to play a role in our domestic energy mix to bring down energy prices and keep the lights on."

In late March Australian Gas Infrastructure Group (AGIG), Jemena Gas Networks, AusNet and Evoenergy released a joint expression of interest for information from the international hydrogen supply chain on the cost of deploying renewable hydrogen at scale.

Through this expression of interest process, suppliers of key inputs to the international hydrogen supply chain are invited to comment on the feasibility, approach and cost of achieving 10 per cent renewable hydrogen by volume across gas networks in the eastern and southern states of Australia.

China mulls massive coal expansion despite pandemic

As energy companies worldwide grapple with the economic impact of the coronavirus pandemic, recent announcements from several key players in China's power sector indicate the country could be considering a major investment spree in coal fired generation.

While there is still no official government announcement on future coal capacity targets, there has been speculation that China could add 150 GW of coal fired capacity under its 14th Five Year Plan due for release next year.

Commenting on the possibility, Frank Yu from Wood Mackenzie's China Power & Renewables team said: "Firstly, we need to be cautious on the headline numbers. Whether China will develop significantly more coal plants is debatable. China Electricity Council and the State Grid, the *de facto* system planners, have been indicating plans for capacity growth, but the actual scale remains uncertain.

"There remains notable domestic pressure against a major increase in coal, as well as uncertainty over electricity demand growth in the current environment. But there is undeniably also growing support for a significant expansion of coal fired capacity."

While at the national level China still has overcapacity in coal, several provinces with high electricity demand are likely to be short of power in the 2020s (including Guangdong and Jiangsu). According to Yu, with limited options in terms of hydro and renewables, either gas or coal will have to fill the gap with some offset by offshore wind and nuclear on the coast.

He says the 'traffic light' system used by the National Energy Administration and provincial planners for project approval is also a useful guide. "We have noticed recently that more provinces, including key coastal markets, are advancing coal fired projects to 'green'. In addition, China aims to approve seven new ultra-high voltage transmission projects this year as part of the economic stimulus plan. Except for those off-taking from hydro plants, these lines will primarily be used to bring coal fired power into demand centres."

Despite the growth in coal, Yu believes the country can still meet its climate commitments. He noted that China's official targets have never included a long-term peak of coal fired generation capacity, but only a peak of total carbon emissions by 2030.

"If coal generation rises, this target would need to be achieved by reducing non-power coal, which currently makes up more than 50 per cent of China's total coal demand and is more polluting than power sector coal. In our view, metallurgical coal demand will peak in 2020, while non-power thermal coal will peak in 2025," he said.

"It is difficult to see the Chinese government allowing a significant increase in power sector emissions longer term. The 14th five-year plan will almost certainly include targets for abatement measures to ensure China's nationally determined contributions commitment of peaking emissions by 2030 and prevent damage to its role in climate change leadership."

■ The pandemic has seen China's electricity consumption decline by 6.5 per cent in the first three months of the year, equivalent to around 170 TWh according to the China Electricity Council. But as people return to work across the country, a recent report from industry association Caixin predicts consumption will fall a narrower 1.5 per cent to 2.5 per cent year-on-year over the first half of 2020, and grow 2-3 per cent for the full year.

Vietnam cuts solar power buying price

Vietnam has scrapped the incentive tariff rate for solar power and approved a new price of VND1640 (7.09 cents)/kWh for this year.

The new feed-in-tariff, which is 24 per cent less than the earlier 9.35 ¢/kWh, is applicable for 20 years from 22 May for projects approved in policy before 23 November 2019, that begin commercial operations before 31 December this year. For all subsequent projects, there will be a bidding mechanism.

The southern province of Ninh Thuan, a solar power hotspot, has been exempt from the change. The projects approved in this province, which begin commercial operations this year, will enjoy the old tariff for 20 years.

The government has also fixed the tariffs for rooftop solar at VND1943 (8.38 cents)/kWh and floating solar at VND1783 (7.69 cents)/kWh.

UK and Brussels argue over climate in Brexit deal

- Paris Agreement must be "essential element" in future EU-UK trade deal
- France and Spain submit National Energy and Climate Plans

The UK is resisting EU pressure to include guarantees on respecting international climate change commitments in a future trade deal following Brexit.

EU officials said the latest negotiating round with the UK has revealed a clear split over cooperation in the fight against climate change.

While the EU wants to nail down guarantees about shared green ambitions, Britain argues that it should not have to make such legal commitments in exchange for preferential access to the European market.

In particular, the EU wants to identify the emissions reduction pact agreed in Paris in 2016 as an 'essential element' in a future EU-UK trade deal, a status normally reserved for core principles such as respect for human rights and the rule of law. The move would create a legal justification for the EU to suspend preferential trading arrangements if Britain abandoned its Paris obligations.

"The commission had already foreseen to include the Paris agreement upfront as an essential element," one EU official told the *Financial Times*. "This means *de facto* that both the EU and the UK commit to respect the Paris agreement, and in case one does not, the other party can take measures. For now, the UK does not seem to want this."

The UK argues that any trade deal must respect its regulatory independence, and says it would not sign up to conditions that went beyond those in the EU's existing trade pacts with other countries.

A UK government spokesperson said that Britain was "absolutely committed to tackling climate change", adding that the country would use its presidency of the next UN climate change conference to drive forward implementation of the Paris accord. Last June the UK adopted a net zero carbon emission target for 2050, making it the first big economy to pledge to cut emissions to close to zero.

The European Commission said in December that the Paris agreement should from now on be included in the 'essential elements' clauses of any trade agreements the EU negotiated with other countries around the world.

France and the Netherlands also called for the step in a joint paper presented in early May.

The talks came as European countries began presenting their National Energy and Climate Plans (NECP) to the European Commission, and countries called for an accelerated energy transition towards renewable energy sources in the midst of the Covid-19 crisis.

At the end of April, France submitted a NECP that will aim for renewables to represent 33 per cent of its energy mix in 2030. Weeks earlier, Spain submitted a plan that will see renewables represent 42 per cent of the country's energy mix and to generate 74 per cent of its electricity by 2030.

Meanwhile, different initiatives are asking European leaders to put the Green Deal at the heart of Europe's economic response to the pandemic. Malta, Slovakia, Slovenia and Ireland recently joined 13 other countries in a call to keep the climate and ecological crises high on the political agenda when developing recovery plans.

Sweden set to end wind subsidies as shift from coal gathers pace

Sweden is planning to eliminate subsidies for onshore wind farms by the end of 2021, at around the same time as neighbouring Norway. The news came as several countries, including Sweden, announced an end to coal fired generation.

On the sidelines of a wind power conference in Stockholm, Sweden's Energy Minister Anders Ygeman said onshore wind developments are already profitable without subsidies. Falling technology costs and battery prices across the board have made unsubsidised onshore wind and solar power the cheapest options for electricity generation in major economies.

Solar and wind power are now cheaper than coal in most parts of the world and Sweden generates more than 54 per cent of its electricity from renewable sources on a sustainable basis.

Sweden recently cemented its shift away from fossil fuels with the closure of its last operational coal fired plant. In April the 120 MW KVV6 coal fired cogeneration unit at Värtaverket, stopped operations after 30 years of service.

The closure makes Sweden the third EU country to exit coal fired power generation after Belgium and Austria closed their remaining plants in April.

Six more European countries are expected to complete promised coal phase-outs by 2025 or earlier, with France aiming to close its last plant in 2022, Slovakia and Portugal scheduled to follow by 2023, the UK aiming for a 2024 target date, and Ireland and Italy planning to shutter their last plants by 2025.

A further five European nations are working to complete coal power phase-outs by 2030, including Greece, the Netherlands, Finland, Hungary, and Denmark. Meanwhile, discussions are currently underway in the Czech Republic, Spain, and North Macedonia over proposed coal phase-out target dates.

The German government has also announced plans to exit coal by 2038 with the target and accompanying compensation packages set to be incorporated in a new coal exit law.

Sweden, Spain have cheapest wind and solar corporate PPAs

Sweden and Spain respectively have the cheapest average corporate PPA prices in Europe for wind and solar electricity, according to BloombergNEF's (BNEF) 1H 2020 European Corporate PPA Price Survey. The first of its kind in Europe, the survey aims to provide pricing transparency and simplify the complexity around corporate power purchase agreements, or PPAs, helping buyers to understand this fast-growing market.

The survey finds that the lowest price levels for onshore wind corporate PPAs in Europe are in Sweden at €30.50/MWh. Solar PV shows its lowest price levels in Spain at €35.30/MWh but is generally more expensive across the region than wind. The report reveals big differences in renewable energy PPA prices across Europe.

Helen Dewhurst, an analyst at BNEF and the author of the report, said: "The very wide range of results was particularly interesting, with the gap between the cheapest PPA you might sign in Sweden and the most expensive PPA in the UK being over €30/MWh."

BNEF's 1H 2020 European Corporate PPA Price Survey looks at the minimum-maximum price range for the most common PPA scenario – a 'base case' – for both solar and wind across nine markets. The survey then shows how PPA prices change depending on three main adjustment factors: capacity, term length and contract structure.

TSOs developing cross-border blockchain platform

A consortium of European Transmission System Operators (TSOs) are jointly developing a cross-border blockchain platform called Equigy, which will enable millions of European households and owners of e.g. electric vehicles to actively offer the flexible capacity of their cars and house batteries on the energy markets.

The platform being developed by TenneT (Germany and the Netherlands), Swissgrid (Switzerland) and Terna (Italy), will allow the TSOs to stabilise an electricity system that has an increasing amount of intermittent renewables, while allowing consumers to earn money from the energy transition.

"Now that the conventional power stations are closing, we are preparing for a future in which we are largely dependent on consumers with their electric cars, home batteries and heat pumps to stabilise the grid reliably, sustainably and cost-effectively. In order for all these devices to work together to balance the grid, the Equigy platform provides an important technical basis, said TenneT's CEO Manon van Beek.

"With this platform, data can be exchanged between the devices, market players and grid operators. This means that everyone will soon be able to help realise the energy transition and also benefit financially from it."

For millions of decentralised small storage units in households in the one to two digit kilowatt range across Europe to be able to offer their free capacity for grid stabilisation, automated processes and IT solutions are needed that make this possible in a simple, fast and cost-effective way.

With the Equigy platform, the TSOs create the conditions for this. As an open source solution, the platform will be available free of charge. The platform uses blockchain technology, which allows transactions from millions of individual systems to be carried out securely, cost-effectively and transparently.

Unambiguous laws and regulations enable consumers, businesses and manufacturers to market the flexible capacity of electric vehicles, domestic batteries and heat pumps easily and location-independently in all participating countries, thus simplifying access to the electricity market. At the same time, all local/regional flexibility platforms can be connected to the Equigy platform so that as much flexibility as possible can be bundled.

The Equigy platform will initially be launched in Germany, the Netherlands, Switzerland and Italy. The partners expect other European network operators to join as well. Denmark's Energinet has already formally expressed its intention to join the consortium, which will extend Equigy's European roll-out to five countries.

- TenneT has contracted eight cable suppliers to develop and test what will be the world's first 525 kV HVDC subsea cable system for the planned 2 GW offshore grid connections in the Netherlands and Germany. TenneT plans to have the new cable system certified in spring 2022. The companies that will jointly develop the new cables system are: Hellenic Cables, LS Cable & System, Nexans Norway, Ningbo Orient Wires & Cables, NKT HV Cables, Prysmian Powerlink, Sumitomo Electric Industries, and Zhongtian Technology Submarine Cable (ZTT).

Offshore wind to dominate capacity growth for next decade

■ Concerns over 40 GW UK target ■ Germany raises offshore ambition

Junior Isles

Offshore wind is expected to become the dominant area of growth for new capacity over the next decade in the EU and UK, according to Fitch Solutions Country Risk & Industry.

Data from its 'Key Projects Database' reveals a robust power project pipeline with 80 GW of non-hydro renewable capacity additions in planning and under construction, of which 54 GW are offshore wind. In comparison, the project pipeline for thermal power generation totals just over 2 GW of capacity, with the majority being natural gas.

"This supports our wind capacity growth outlook for the EU and UK, which will see an annual average rate of expansion of between 4.5 per cent and 6.7 per cent y-o-y, respectively, over the next decade," the company said in a statement.

Fitch Solutions highlights nine key markets in the region that are making progress with large scale offshore wind developments, which will see long term capacity growth and lead to offshore wind making up 7 per cent of the total power capacity in the region by 2030.

The improving cost competitiveness of the offshore market will continue to make realising the region's expanding project pipeline more feasible. For example, in the latest UK offshore wind auction, prices registered below £40/MWh, touching or breaching the wholesale price of electricity and leading to negative subsidy pricing.

Fitch Solutions highlights four key market leaders – UK, Germany, Netherlands and Denmark.

UK: Forecasted offshore wind capacity growth in the UK is the same as the entire EU market combined, building on the already installed capacity of almost 10 GW (compared to EU installed capacity of 12 GW). It noted that 27 GW is either currently under construction, in pre-construction, or in the planning stages. Notably, in late March construction began on the world's largest offshore wind farm – the 3.6 GW Dogger Bank project near the coastal village of Ulrome.

While Fitch Solutions expects the UK to realise the required level of deployment, others warn of the huge investment needed. According to renewable energy analysts Aurora, $62 billion will be required to meet the 40 GW by 2030 target.

Martin Anderson, Head of Renewables at Aurora, recently said: "Our analysis suggests that meeting the 40 GW target will require a huge increase in the deployment rate of offshore wind turbines, alongside significant capital investment, and planning consents to be approved in record time."

He added: "Whilst offshore wind has demonstrated significant cost reductions in previous auctions, the impact of higher levels of renewables in the system will reduce offshore wind capture prices and the subsidy support schemes will require further budget.

SSE Renewables, which is developing Dogger Bank with Equinor, called for a series of enabling offshore wind policy actions from the UK government, warning that a business as usual approach will not deliver the 40 GW target. The developer said an increase in capabilities and cooperation across government departments is needed to allow annual deployment rates to hit up to 4 GW from 2025.

The current pandemic will also make the task more challenging. In late March the Crown Estate reworked the timetable for its Round 4 offshore wind leasing round, giving interested parties more time to respond during the Covid-19 outbreak period.

Through the leasing round, the Crown Estate will seek to award at least 7 GW of new seabed rights for wind projects off the coasts of England and Wales, making available four Seabed Bidding Areas with water depths of up to 60 m. The Crown Estate said it would keep monitoring the situation with the spread of the coronavirus closely and provide further updates, if necessary. The whole tender round is expected to last 12 months, it announced previously.

Germany: The German government, meanwhile, seeks to expand on an already large 7.4 GW of capacity, with an additional 5.7 GW in the project pipeline. However, due to political pressures and expanded demand cases for capacity Fitch Solutions sees an upside risk to the country expanding its targets over the coming decade.

Nevertheless, in mid-May the German federal government, the coastal states, and the transmission system operators signed a joint agreement to raise Germany's offshore wind capacity target from 15 GW to 20 GW by 2030.

The agreement is said to offer concrete milestones and timelines for all involved parties to ensure that the necessary planning and approval steps, as well as the construction of the connection lines and the offshore wind farms, go hand-in-hand.

Netherlands: While currently the Netherlands has just over 1 GW of installed offshore wind capacity, the government aims to rapidly expand total offshore wind capacity to 3.5 GW by 2023. Fitch Solutions says the Netherlands currently has 4 GW of capacity additions in the pipeline, but sees an upside to more additions with a new government target of a total 11.5 GW road-mapped over the decade.

In mid-April the Netherlands Enterprise Agency (RVO) said it intends to issue an invitation to tender for work on up to two of the three offshore wind zones identified in the Dutch Offshore Wind Energy Roadmap 2030. The wind farms at the sites are expected to be commissioned between 2024 and 2030.

At the end of April ROV also said it closed the application period for the Hollandse Kust (noord) Wind Farm Zone tender. Several developers have applied for a permit to build and operate an offshore wind farm in the zone without a government subsidy.

RVO will now assess the applications and announce the winner of the permit by the end of July. The developers are competing for a permit to construct an offshore wind farm of at least 700 MW of capacity. This tender is the fifth in a series of tenders aimed at fulfilling the 11.5 GW target.

The Hollandse Kust (noord) is one of three offshore wind areas chosen by the Dutch government to be developed by 2023, as part of the country's Energy Agreement for sustainable growth: Hollandse Kust (noord); Borssele; and Hollandse Kust (zuid).

In late April, Swedish energy company Vattenfall and transmission system operator (TSO) TenneT signed an agreement for the construction of offshore grid connection for the 760 MW Hollandse Kust (Zuid) 3 and 4 offshore wind farms.

Denmark: Currently having 1.7 GW of installed capacity, Fitch Solutions noted that Denmark is progressing with a further 1.1 GW already in the pre-construction phase and a further 1.2 GW in planning. While 4 GW is not as sizable a cumulative deployment as the UK or Germany, given Denmark's size it represents a considerable development at almost 30 per cent of national net installed capacity.

Meanwhile, although currently having minimal or no levels of offshore wind farms in operation, Fitch Solutions also identified France, Poland, Ireland and Estonia as markets seeking to make large scale plays in the sector.

France currently has 2 MW of offshore wind capacity in operation but in late April the government lifted its offshore wind procurement target to a maximum of 8.75 GW from 4.7 GW-5.2 GW previously, planning to bring this capacity online by 2028.

The enhanced goal was unveiled in the country's recently published final energy roadmap, known as Programmation pluriannuelle de l'energie (PPE). The plan envisages the installation of 2.4 GW of capacity with targeted commissioning by 2023, while between 5.2 GW and 6.2 GW of wind farms are planned to become operational by 2028.

The tenders will start this year with a 1 GW round in Manche Est Mer du Nord, while another one for between 500 MW and 1 GW will be held in 2021 and 2022 for a south Atlantic area. An additional tender for a location that has still not been identified is planned to take place in 2023, targeting 1 GW. Separately, three rounds for floating offshore wind capacity of 250 MW each will be held in 2021 and 2022.

Poland has no installed offshore wind farms but state backing has been shifted to support several large farms with a planned capacity of 3.7 GW. Poland is increasingly looking to become a power exporter and to diversify its generation portfolio away from coal.

Estonia has an increasing drive to become more energy self-sufficient. The country has plans to develop 2.7 GW of offshore capacity of which the permitting process for 1 GW was brought forward in early 2020.

Fitch Solutions sees Ireland as a latecomer in comparison with its neighbour, the UK. "We see expansion taking place with preliminary site assessments and permitting processes moving forward with large sites totalling almost 3 GW. We also see considerable progress moving forward on a large 700 MW floating farm," it concluded.

Norway approves pioneering floating wind energy project

Norway's Oil & Energy Ministry has approved development plans for Equinor's wind power project Hywind Tampen in the North Sea. Hailed as the largest such project in the world, Oil & Energy Minister Tina Bru called it the start of a new era for Norwegian industry.

With construction due to start in 2022, the wind farm will use 11 floating wind turbines to power the Snorre and Gullfaks oil platforms. It is believed to be the first time this will happen anywhere.

"Hywind Tampen is a pioneering project and a central contribution to reducing emissions from Gullfaks and Snorre," said Arne Sigve Nylund, Equinor's Executive Vice President for Development & Production Norway. "I am pleased that both ESA and Norwegian authorities have approved the project.

"We are experiencing very challenging times, and we are focusing on continuing our transition effort while attending to and developing the value on the Norwegian continental shelf and at the same time reducing the climate footprint from our operations."

The 8 MW turbines will have a total capacity of 88 MW and meet about 35 per cent of the annual power demand of the five platforms Snorre A and B and Gullfaks A, B and C. The wind farm will be located around 140 km from shore, between the Snorre and Gullfaks platforms, at a water depth of 260-300 m.

By reducing the use of gas turbines at the fields, the project will help reduce CO_2 emissions by more than 200 000 tonnes per year, corresponding to the annual emissions from 100 000 private cars.

The Norwegian authorities have granted funding of up to NOK 2.3 billion ($231 million) through state-backed lender Enova. The business sector's NOx-Fund has also decided to support the project with up to NOK 566 million.

The project has, however, stirred debate. Equinor claims it will not be profitable and needs state support, while others say Equinor should finance it using its profits generated over the years.

Anders Opedal, in charge of technology, projects and drilling at Equinor, noted that because it is a pioneering project, "it is clear costs become high".

The NOx-Fund was set up in 2018 to support measures aimed at reducing nitrous oxide, or NOx, emissions from equipment such as gas turbines. So far it has committed more than 236 applications to support NOx reduction since its launch.

Renewables will still see gains

- Wind represents $600 billion opportunity
- Solar PV forecast for 2020 cut to 106 GW

Renewable energy technologies will continue to show strong growth despite the near-term hurdles presented by the coronavirus.

Despite demand fluctuations, the global wind turbine supply chain is racing towards a $600 billion cumulative opportunity by the end of 2028 according to new analysis from Wood Mackenzie. The research firm also forecasts that annual average wind turbine supply is forecast to hit $60 billion between 2020 and 2028 – reflecting an increase of 8 per cent compared to 2019.

Higher average turbine prices and a 20 per cent growth in offshore demand reflect a 37 per cent uptick in supply chain potential, representing a cumulative value of $222 billion by 2028. Strategic capital components, such as blades and towers, present a $25 billion cumulative opportunity by themselves.

The pandemic will, however, have an impact. More than 44 GW of combined peak wind demand in the US and China is expected to strain the wind supply chain in 2020. Additionally, a shortage of several critical components has been further exacerbated by the coronavirus crisis.

Shashi Barla, Wood Mackenzie Principal Analyst, said: "A rush in installation activity has caused a shortage of blades and bearings. The coronavirus has jeopardised approximately 10-15 per cent of production volumes in China, Spain and Italy. However, Chinese companies resumed production in early March, resulting in a downgrade of only 3 GW for 2020 installations.

"Just over $6 billion worth of turbines and component supply production is already jeopardised in Q1 2020. The coronavirus impact could worsen this if facilities continue to face delays in resuming production."

Wood Mackenzie says the pandemic will have a range of different impacts on the future deployment of renewable energy.

Analysts expect to see a disproportionate impact on demand for solar PV projects and storage systems, as well as electric vehicles. As a result, the research firm has lowered its full-year forecast for new PV capacity additions by 18 per cent from 129.5 GW to 106.4 GW in 2020. And the consequences of the coronavirus crisis will be felt throughout the coming year and beyond, which is why the company has also cut its 2021 outlook for solar demand by 3 per cent compared to previous forecasts.

The forecast for the global storage market is similarly bleak. For example, WoodMac reduced its base scenario for 2020 by 20 per cent, mainly due to delays in project implementation. However, the growth of storage throughout the world will still exceed the levels seen in 2019.

Demand slump deepens Eskom's woes

A slump in South Africa's energy demand as a result of lockdown measures has further deepened the challenges facing Eskom, the country's embattled state power utility.

Earlier this month, Eskom's Chief Executive, André de Ruyter announced that income shrunk by about R2.5 billion in April as demand plummeted.

"We have seen a reduction in cash-generation for April of some R2.5 billion. The full financial impact will still need to be assessed," De Ruyter told a virtual meeting of Parliament's portfolio committee on public enterprises.

He said the power utility's "reliability" maintenance programme has been hampered by the restrictions imposed by the health crisis in that foreign experts could not travel to South Africa as required.

The national lockdown has, however, had some positive spin-offs for Eskom in that the lower demand has given the power utility the breathing space to carry out short-term opportunity maintenance at some of its facilities, and also reduced the chances of load shedding this winter said De Ruyter. Eskom said it was able to build up buffer capacity amounting to more than 10 per cent of daily consumption.

At the beginning of April reduced demand led the company to propose a plan for South Africa's 22 wind farm power operators to stop producing electricity. Eskom failed to alert or warn the independent power producers (IPPs), which have a combined installed capacity of 1980 MW prior to issuing the notices.

The decision caught many by surprise. Ntombifuthi Ntuli, CEO of the South African Wind Energy Association (Sawea), said: "It is concerning that wind energy power producers have not been given an opportunity to engage on this matter with Eskom, despite both Eskom and government confirming that operational IPP's are in fact an essential service."

Experts noted that should power curtailment be required, the wind sector is able to curtail on short notice and in precise increments. However, according to the agreements in place, energy producers must be paid a fee in line with the philosophy that all power that would have been generated is paid for.

The industry is seeking legal counsel on whether the reduced electricity demand as a result of Covid-19 does in fact constitute *force majeure*, as declared by Eskom.

In early April, debt-stricken power company, told investors it currently does not need to approach the government for more support, even as the national shutdown slashed revenue. The company needs to raise Rand 89 billion ($4.9 billion) this year and R56 billion of that will come from an existing state bailout.

The company is currently in the process of being split into three divisions in accordance with the roadmap for a restructured electricity industry as published by the Department of Public Enterprises. De Ruyter said the process was "on track" but noted that spreading Eskom's massive R450 billion debt between each division was still being worked out.

Uzbekistan outlines 10-yr strategy for electricity production

Uzbekistan's Ministry of Energy has announced a new strategy for the production and provision of electricity between 2020-2030 amid increasing energy demand from a growing population and a fast-developing economy.

The strategy, outlined in a document posted by the ministry, envisages the modernisation and reconstruction of existing power plants, construction of new generating assets using energy efficient power production technologies, improvement of electricity metering systems and development of renewable energy sources.

While the state owns hydropower plants, nuclear power plants and some thermal power plants, the document said that most of the country's power plants will be concentrated in the private sector by 2030.

To achieve the development goals for renewable energy, Uzbekistan will construct 3 GW of wind and 5 GW of solar power plants by 2030, the document said. As part of this, in April the country launched the tender for a 100 MW independent power producer (IPP) wind farm project, which will be implemented with the support of the European Bank for Reconstruction and Development (EBRD).

In early May, the ministry on behalf of the National Electric Grids also invited tender offers for the engineering, procurement and construction of a 500 kV electricity transmission line between Uzbekistan and Tajikistan.

The single circuit transmission line will link a substation in the southeastern Uzbek district of Guzar and another in the western Tajik town of Regar, with a distance of 63.5 km.

As Uzbekistan has obtained financing from the Asian Development Bank (ADB), the invitation is open to bidders from eligible source countries of the ADB and the project is expected to be completed within 12 months of the winning contract coming into effect.

AUC and Irena to advance renewables in response to Covid-19

The African Union Commission (AUC) and the International Renewable Energy Agency (Irena) have agreed to work closely to advance renewable energy across the continent to bolster Africa's response to the Covid-19 outbreak.

The two organisations will focus on innovative solutions to drive the development of renewable energy including decentralised systems, and to increase access to energy across the continent.

The cooperation aims to support Africa's response to the pandemic by, among other things, improving the ability of rural health centres and communities to deal with the health challenge using renewable energy to power critical services such as medical equipment and water pumping for improving hygiene.

Africa is home to more than two thirds of the world's least developed countries and 600 million people currently live without access to modern energy services. Yet the continent possesses vast renewable energy potential that could cover nearly a quarter of its energy needs through indigenous renewable energy by 2030. The deployment of renewables-based solutions is therefore seen as crucial to achieving universal electricity access for the population.

The AU and Irena will also collaborate in the context of Irena's Clean Energy Corridors initiatives in East, West and Southern Africa. This will focus on advancing the deployment of renewables through the creation of larger and more robust power markets designed to encourage cross-border trade of electricity generated from renewable energy sources.

The AU is a continental body consisting of the 55 member states that make up the countries of the African continent. It was officially launched in 2002 as a successor to the Organisation of African Unity (OAU, 1963-1999). The Department of Infrastructure and Energy is responsible for coordinating and promoting the development energy, transport, tourism and ICT sectors in Africa.

Global companies plug into hydrogen

■ Plug Power eyes acquisitions to secure green H_2 ■ H_2 forms part of Siemens, Uniper decarbonisation agreement

Junior Isles

A growing number of companies around the globe are showing an increasing interest in moving into the hydrogen business.

In early May, US-based Plug Power Inc., a provider of hydrogen fuel cell turnkey solutions, said it is looking to acquire two companies as part of its objective of having over 50 per cent of its hydrogen green by 2024.

The first target is Pennsylvania-based United Hydrogen Group Inc., which produces liquid hydrogen with a low carbon footprint, using byproduct hydrogen from chlor alkali plants.

Plug Power owns a convertible bond in United Hydrogen, which could be equal to an equity interest of over 30 per cent on a converted basis, and is in advanced talks to acquire the company.

Plug Power is also looking to acquire a yet to be named electrolyser technology platform company. If this deal is completed, Plug Power will gain access to electrolyser products ranging from 100 kW to over 1 MW. Plug Power also expects to be able to rapidly scale up this product line.

Talks with both companies are still ongoing and there is no guarantee that any deal will go through, but Plug Power expects that both potential purchases can be closed by the end of the second quarter.

Interest in hydrogen is gaining momentum across the globe. In early April a group of five Singaporean and two Japanese companies signed a memorandum of understanding (MoU) to study hydrogen as a low-carbon alternative that could contribute to a clean and sustainable energy future for Singapore.

The seven companies will work together to evaluate the technical and commercial feasibility of hydrogen as a green energy source in Singapore. The agreement will cover research and development of technologies for importing, transporting, and storing hydrogen. The Singaporean companies are: PSA Corporation; Jurong Port; City Gas; Sembcorp Industries; and Singapore LNG. The Japanese companies involved are Mitsubishi and Chiyoda.

European organisations are also among those leading what is fast becoming a charge for hydrogen. Siemens and Uniper recently announced an agreement to decarbonise the German utility's power generation and promote sector coupling. One focus of the planned cooperation is the production and use of 'green hydrogen', i.e. hydrogen from renewable energy sources.

Also in Germany, in late March a group of companies formed a partnership to jointly develop the country's first network, which will link producers of green hydrogen with industrial customers.

The tie-up includes BP and RWE as well as chemicals producer Evonik and transmission system operators Nowega and OGE. The companies have signed a MOU to develop the network from Lingen, Lower Saxony, to Gelsenkirchen in North Rhine-Westphalia state, planning first supplies after late 2022.

Elsewhere in Europe, Italian energy infrastructure company Snam, and RINA, a global testing, inspection, certification and engineering consultancy firm, formed a joint working group to study and test the compatibility of industrial burners and other existing infrastructure already in operation with hydrogen. The group will also begin experiments, analysis and technology scouting in various areas involving hydrogen including production, storage and distribution.

In 2019, Snam became the first European company to successfully test the introduction of hydrogen blends into its gas transmission network with a percentage volume of up to 10 per cent.

According to a recent study ('Hydrogen Challenge: The potential of hydrogen in Italy') commissioned by Snam, hydrogen could cover almost a quarter (23 per cent) of Italy's energy demand by 2050 under a deep decarbonisation scenario.

Wind turbine producers adjust to pandemic

Europe's major wind turbine manufacturers have largely had a good first quarter but are unable to give any guidance for the year due to 2020 guidance due to the continuing uncertainty about the impact of Covid-19.

Vestas, which became the first wind turbine manufacturer to install more than 10 GW of wind capacity in a single year (2019), showed revenue increased by 29 per cent to €2.24 billion ($2.58 billion) in the quarter compared with Q1 2019.

The quarterly intake of firm and unconditional wind turbine orders amounted to 3311 MW. The value of the combined backlog of wind turbine orders and service agreements stood at €34.1 billion – an increase of €5.8 billion compared with Q1 2019.

The company, however, was forced to maintain the suspension of its 2020 guidance due to the pandemic, which has led it to halt some of its projects with immediate effect and lay-off around 400 employees. The company says it will cut its workforce across functions that do not directly support its 2020 deliveries.

"We're in a period of high uncertainty and by making a strategic decision on our product portfolio and reduce complexity, we sustain our competitiveness in the future and ensure we can adjust quickly to Covid-19 challenges," said Henrik Andersen, President and CEO of Vestas.

Meanwhile, Siemens Gamesa's performance in the second quarter of FY 2020 (January-March) reflected the unexpected effect of the pandemic on its operations and commercial activity, with a direct impact of €56 million on the company's profitability. The situation further intensified the challenges in the onshore business, mainly in the Indian market and the execution of projects in Northern Europe.

Although the lack of short-term predictability has led the company to withdraw the guidance it issued in the first quarter of 2020, Siemens Gamesa says the long-term prospects for the company and the industry and remain sound. The company registered a record order backlog of €28.6 billion (+21 per cent YoY).

Nordex Group reported that its first quarter 2020 results were in line with expectations as sales for the period increased to €964.6 million compared with €398.9 million for Q1 2019.

It said, however, that the Covid-19 pandemic has caused major interruptions and led to adjustments in important parts of the business such as procurement and production. Given the continued uncertainty about how long the interruptions will last and the current difficulty in estimating any further consequences for the supply chain, production and completion of projects (installations), the company said it is no longer possible to give a reliable and realistic assessment of future business performance and therefore decided to withdraw its guidance for financial year 2020.

Renewables help utilities remain robust

European utilities are showing a level of resilience in the midst of the Covid-19 pandemic, largely due to renewables in their portfolios, as they report robust first quarter earnings.

According to Bloomberg Intelligence, utilities are the third best performing sector on the Stoxx 600 this year, down 11 per cent instead of the 17 per cent slump the broader market has suffered.

Ørsted maintained its earnings guidance for the year in its first-quarter update to the market. The Danish pure-play renewables company currently has more than DKK30 billion ($4.35 billion) in available reserves, giving it confidence it can support its business and construction initiatives through 2020 and 2021 without further funding.

According to Bloomberg Intelligence, conservative hedging and 90 per cent of generation from renewables should largely shield Ørsted's profit from the sharp decline in power prices and demand

It is a similar story for Iberdrola. The Spanish energy giant allayed concerns that the coronavirus is damaging its business despite a collapse in demand in one of the nations hit hardest by the pandemic. It maintained its growth and dividend target for the year. Iberdrola has decided to increase capital expenditure by 23 per cent in 2020, from €8.15 billion in 2019 to €10 billion, to support the country's economic recovery.

Nevertheless, most utilities are having to adapt, not only to maintain a healthy operation but also to help stimulate their economies.

Essen-based energy company E.On sent a signal amid the corona crisis that it will support a sustainable economic recovery by increasing investments in climate-friendly, technologically advanced energy infrastructure.

E.On SE's CEO, Johannes Teyssen, emphasized that despite the crisis, the company will continue to do everything it can to combat climate change. The crisis had only a limited impact on its first quarter but the company warned the pandemic's overall implications cannot yet be reliably estimated.

Vattenfall, the state-owned Swedish utility, showed how to profit from a collapse in prices by earning kr1.77 billion ($180 million) from buying and selling energy. Traders managed to navigate volatile markets driven by the growing impact of the pandemic and a glut of natural gas that sent European benchmark prices down by almost half this year. Profit for Vattenfall's growing wind business was up 44 per cent.

Ratings agency Moody's said in a new report that the outlook for the unregulated electric and gas utilities sector in EMEA for the coming 12 to 18 months has changed to stable from positive in the wake of the coronavirus outbreak.

Mitsubishi and Chubu acquire Eneco

Japanese companies Mitsubishi Corporation and Chubu Electric Power Co., Inc. have completed their acquisition of Dutch integrated renewable energy company Eneco.

By taking advantage of Eneco's strength in the renewable energy sector, Mitsubishi is aiming to accelerate its own renewable developments in Europe and around the world. Mitsubishi sees the acquisition as an opportunity to help reduce greenhouse emissions and realise its vision of simultaneously generating economic, societal and environmental value through its businesses.

By combining its expertise in the energy sector with Eneco's strength and expertise, Chubu Electric is aiming for a mutually beneficial business-model evolution, through which it can create synergies in its energy operations, both in Japan and around the world.

Americas

ABB to strengthen South American grid

ABB's Power Grids business has signed a five-year framework contract estimated to be worth around $100 million with South America's largest utilities company, Interconexion Electrica S.A. E.S.P. (ISA).

Highly reliable shunt reactors will be supplied ensuring that the voltage stays within safe limits, avoiding possible blackouts. To protect the electrical network and help prevent power outages, the contract also includes the supply of gas-insulated switchgear, air-insulated switchgear equipment such as circuit breakers, instrument transformers and hybrid modules.

Nordex to supply 59 MW to Brazil

The Nordex Group has received another order for AW132/3465 turbines from Brazil. The manufacturer will supply 17 turbines for its regular customer Voltalia Brasil, for its 58.8 MW Ventos Serra do Mel 4 (VSM 4) wind farm.

The order also includes an agreement for service and maintenance of the turbines for a period of 15 years.

The wind farm VSM 4 will be built in Voltalia's Serra Branca Cluster located in the state of Rio Grande do Norte, near to the city of Serra do Mel in the northeast of Brazil.

Nordex will install the turbines for VSM 4 on 120 m concrete towers produced by its local factory in Areia Branca, Rio Grande do Norte. In order to ensure the project includes maximum local content, Nordex will manufacture the nacelles in its plant in Simões Filho in Bahia as well as purchasing the rotor blades from Brazil.

Installation works on VSM 4 are due to start in 2020, with full commissioning scheduled for spring 2021.

GE digital twins and AI will support SMR O&M

The US Department of Energy (DOE) has contracted two teams of industry experts to develop tools to transform the operations and maintenance (O&M) of advanced nuclear reactors through the use of Artificial Intelligence (AI)-enabled digital twins. The teams will use the GE Hitachi (GEH) BWRX-300 small modular reactor (SMR) as a reference design.

The GE Research-led team, consisting of Exelon Generation, Oak Ridge National Laboratory (ORNL), the University of Tennessee-Knoxville and GEH will build a digital twin of BWRX-300 critical components and utilise AI predictive technologies to make risk informed decisions. Exelon, which operates the largest US fleet of nuclear power plants, will provide historical data based on significant experience to inform the model and targets which are aimed at reducing the operating and maintenance costs of advanced reactors.

The MIT-led team, consisting of GE Research and GEH, will advance and demonstrate new predictive maintenance approaches and model-based fault system detection techniques.

The digital twins will address mechanical and thermal fatigue failure modes, which drive operations and maintenance activities.

Abhinav Saxena, a Senior AI Scientist at GE Research and project leader on the AI-enabled predictive maintenance digital twins project, commented: "We're excited at the prospect of applying GE's digital twin technology and our novel concept of Humble AI to advanced nuclear reactors.

"Humble AI is part of a new lexicon of AI terms emerging, as AI becomes integrated into critical industrial infrastructure where safety, reliability and performance are paramount. It will allow us to deliver improved performance and services, while maintaining and even enhancing safety and reliability."

Asia-Pacific

Landis+Gyr to deliver HK smart meters

Landis+Gyr has been awarded an Advanced Metering Infrastructure (AMI) contract by The Hongkong Electric Co., Ltd. in support of Hong Kong's transformation into a smart city.

The contract includes the deployment of Landis+Gyr's Gridstream solution platform comprising Landis+Gyr smart meters, communications infrastructure, head-end system and meter data management system over the next two years.

Additionally, the contract provides an opportunity to help HK Electric optimise the value of its grid assets by leveraging Landis+Gyr's Advanced Grid Analytics for selected use cases.

MHPS and Hyundai secures Datan GTCC

Mitsubishi Hitachi Power Systems, Ltd. (MHPS) and Hyundai Engineering Co have secured major equipment orders for converting Taiwan's Datan gas turbine simple cycle plant to combined cycle.

MHPS will supply a steam turbine that will increase the plant's capacity by around 50 per cent, from about 600 MW to 900 MW.

Hyundai, meanwhile, will deliver the steam turbine generator. The $340 million contract marks the company's first power plant order in the island nation.

The Datan power plant in the city of Taoyuan, approximately 50 km west of the city of Taipei, is scheduled to begin combined cycle operation in November 2023.

Toshiba to rehabilitate Sedawgyi hydro plant

Toshiba Energy Systems & Solutions Corporation has received an order for two approximately 14 MW hydro turbines and a control system to rehabilitate the Sedawgyi hydropower plant. The project is being undertaken by the Myanmar Ministry of Electricity and Energy-affiliated Electric Power Generation Enterprise.

The hydro turbines will be rehabilitated using existing parts and newly supplied equipment such as runners. The control system will also be replaced to include the latest technology.

Vestas secures wind turbines in China

Vestas Wind Systems A/S has secured 301 MW of turbine orders for three projects in China.

Under the larger deal, totalling 202 MW, the Danish wind turbine maker will supply 56 units of its V136-3.45 MW machines in a 3.6 MW power optimised mode for an unspecified project in the Asian country. It will also service the turbines for two years, as part of an Active Output Management 4000 (AOM 4000) contract. Vestas expects to start delivering the equipment in the third quarter of this year. The power plant will go online in the same quarter, as well.

The manufacturer has also bagged a deal to equip two wind parks in China's Jiangsu province with a combined capacity of 99 MW. Both projects, for unnamed customers, will use a mix of Vestas' V155-3.3 MW and V110-2.2 MW turbines, which the Danish firm will service under its first 20-year service agreement in China.

A total of 16 V155-3.3 MW and 21 V110-2.2 MW machines will be used for the two sites, with deliveries planned to start in the second quarter of 2020. The wind farms are slated for commissioning in the following quarter.

Europe

SGRE to supply 11 MW DD turbines for Ørsted

Ørsted has conditionally named Siemens Gamesa Renewable Energy (SGRE) as the preferred turbine supplier for two offshore wind power projects in the German North Sea totalling 1.142 GW. SGRE will deploy its new SG 11.0-200 DD offshore machines at the 900 MW Borkum Riffgrund 3 and the 242 MW Gode Wind 3 sites. A five-year service and maintenance agreement is included in the preferred supplier award.

The award is subject to certain conditions including Ørsted's final investment decision, which itself is subject to the projects receiving final grid dates and final consents from German authorities. The Borkum Riffgrund 3 project will be the largest offshore project in Germany to date.

The final number of turbines for both projects is still to be determined. Ørsted expects the installation of Gode Wind 3 to begin in 2023, with commissioning completed in 2024. Installation at Borkum Riffgrund 3 is expected to begin 2024 and commissioned in 2025.

The SG 11.0-200 DD offshore wind turbine features a 200 m diameter rotor utilising the 97 m long B97 IntegralBlade design extended to reach the new length, whereas the generator capacity remains at 11 MW. The upgraded machine provides an increase of 9 per cent in Annual Energy Production compared to the SG 10.0-193 DD offshore wind turbine.

Valmet to convert lignite fired boiler to biomass

Finland-based technology company Valmet has received an order from Zespół Elektrowni Pątnów-Adamów-Konin SA (ZE PAK) to convert a lignite-fired boiler plant into biomass combustion at its combined heat and power plant in Konin, Poland.

The value of the order is approximately €20 million.

The converted boiler plant will be handed over to the customer in the autumn of 2021.

The investment will enable Konin to be the first Polish city that is heated with energy originating exclusively from renewable sources.

Dolna Odra to use GE HA advanced GTs

GE is to supply two high efficiency, low emission combined cycle units for the Polska Grupa Energetyczna Górnictwo i Energetyka Konwencjonalna's (PGE) Dolna Odra power plant in the Western Pomerania region of Poland. The order will cover the supply of two GE 9HA.01 advanced gas turbines, along with two STF-D650 steam turbines, to provide up to 1.4 GW.

The project will help stabilise the regional grid, which heavily utilises variable onshore and offshore wind farms currently.

Greek tender attracts lowest tariffs

Bid prices for solar power have fallen below €50 per MWh for the first time, according to the Ministry of Environment and Energy of Greece. At the latest auction, regulators accepted a bid of €49.11/MWh by a firm controlled by PPC Renewables SA for a 200 MW photovoltaic project. PPC Renewables is a subsidiary of state-owned Public Power Corp. SA or PPC.

The Regulatory Authority for Energy, RAE, accepted offers for installations of an overall 502.9 MW in five renewables projects, of which one is a future wind park. Investor interest was stronger than in the previous round, attracting 44 bids. It was the second time that wind and solar power had a mixed auction.

Final prices averaged €52.02/MWh, compared to €60.46/MWh last time. In the solar segment, the benchmark level landed at €51.37/MWh, after €61.13/MWh in December's sale.

International

RFP launched for Abu Dhabi sub-sea cable

Abu Dhabi National Oil Company (ADNOC) and Abu Dhabi Power (ADPower) have issued joint requests for proposal for the development and operation of a high-voltage, direct current (HVDC) sub-sea transmission system in Abu Dhabi, UAE.

The system, which will have two independent sub-sea HVDC transmission links and converter stations, will connect ADNOC's offshore production facilities to ADPower's onshore electricity grid.

The link will have a total capacity of 3.2 GW. Commercial operations will likely begin in 2025.

Valmet automation for Moscow WTE plant

Valmet will supply automation to a new waste-to-energy (WTE) facility in Moscow, Russia. The order was placed by Hitachi Zosen Inova AG (HZI), the engineering, procurement and construction contractor for the facility.

Delivery will take place in 2021 and the system will be handed over to the customer in June 2022.

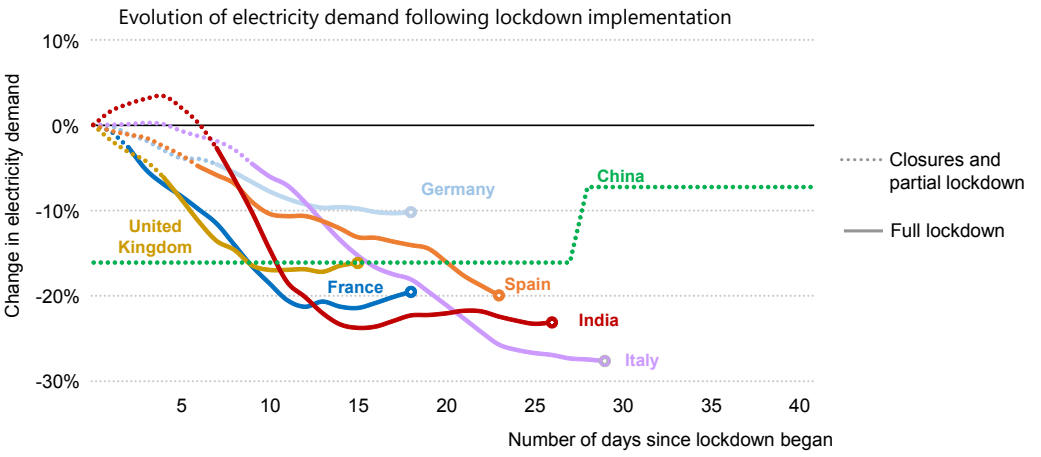
The new WTE plant will be started up in 2022. It will process 720 000 tons of municipal solid waste per year and have a thermal capacity of 227.5 MW and an electrical capacity of 75 MW. It will be the first of four plants that will be constructed in the Moscow region in the coming years.

Ethiopia orders geothermal unit

Toshiba Energy Systems & Solutions Corporation together with, Toyota Tsusho Corporation and Turkish engineering company Egesim Energy Electro-Mechanic Construction Contracting Co., Ltd., have received an engineering, procurement and construction contract for the Aluto Langano Geothermal Wellhead Power System in central Ethiopia. Toshiba ESS will supply the steam turbine and generator for the project, which is being developed by the Ethiopian Electric Power.

Aluto Langano Geothermal Wellhead Power System is a 5 MW small scale geothermal power plant where EEP plans to commence commercial operations in August 2021.

Lockdowns are sharply reducing electricity demand



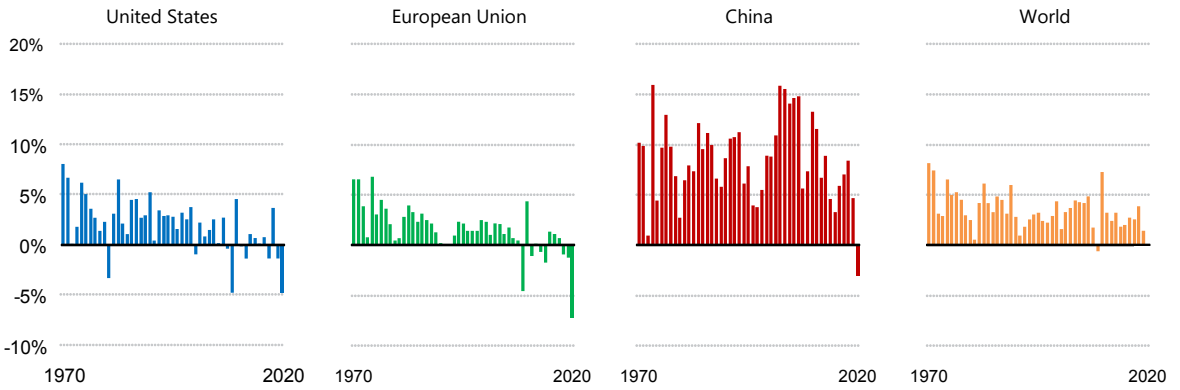
Electricity demand drops to Sunday levels under lockdown, with dramatic reductions in services and industry only partially offset by higher residential use. Service-based economies suffer the most.

For more information, please contact:

International Energy Agency
9, rue de la Fédération
75739 Paris Cedex 15
France.

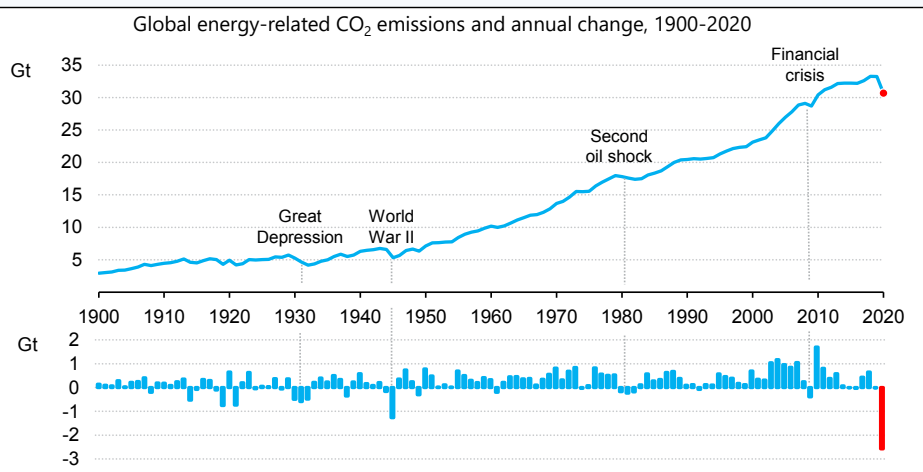
Email: bookshop@iea.org
website: www.iea.org

Electricity demand to face biggest ever decline



Global electricity demand is set to fall by 5% in 2020, the largest decline since the Great Depression. Impacts are largest in the European Union and United States, but extend to all corners of the world.

CO_2 emissions drop the most ever due to the COVID-19 crisis



Global energy-related CO_2 emissions are set to fall nearly 8% in 2020 to their lowest level in a decade. Reduced coal use contributes the most. Experience suggests that a large rebound is likely post crisis.

Source: IEA Global Energy Review: The impacts of the COVID-19 crisis on global energy demand and CO_2 emissions, 30 April 2020

Oil

Oil industry again seeks balance in an ever-changing world

■ Demand will not return to normal overnight ■ Further cuts urged

Gary Lakes

Opec officials are again commenting on restoring 'balance' to the global oil market, but with millions of barrels of oil in storage and demand unlikely to return to anything like what it was before the Covid-19 pandemic, it could be a considerable time before 'balance' becomes the appropriate term to use in reference to the oil market.

The world was awash with oil even before the pandemic, and the decision by Saudi Arabia to ramp up production in order to force some producers – notably shale – out of the market (with the idea that that would reduce supply and boost prices) just as the coronavirus hit was a colossally bad move. That rationale had failed once before, yet why the Saudis, in their dispute over production cuts with Russia, would think that it would work during a second try was, shall we say, ill thought out.

In April, the price of a barrel of West Texas Intermediate (WTI) actually turned negative for the first time in history. There was just no place to put it. Those who bought oil and are buying it now have somewhere they can store it, and some are seeing a profit. But storage remains tight at all possible locations and more and more oil tankers are serving as floating storage until they are directed to make a delivery.

The market has improved since those really alarming days just a few weeks ago. WTI is now back to around $29/b and Brent is over $32/b, but the market is still volatile and a second wave of the virus could create more 'demand destruction' for crude oil and cause further damage to the global economy.

Yet every day that oil prices register an increase is hailed as a sign that the market is coming back.

It is important for Opec to exude an air of confidence in a commodity whose future has been questioned as a result of the impact of Covid-19. Many companies are finding that it is practical for employees to work from home, eliminating the need for a daily commute that depends on hydrocarbon to fuel. If this work from home concept takes root, oil demand for transportation will not return to its pre-Covid volume in some parts of the globe. Large cities, accustomed to heavily polluted air are getting a glimpse of blue sky for the first time in years. Something like that has to make an impression, leaving no one keen to return to breathing air that is almost as bad for you as the coronavirus itself.

In mid-May, in an interview with Bloomberg, Opec Secretary General Mohammad Barkindo said the organisation is now "cautiously optimistic that the worst is behind us. What we saw in April was extraordinary," Barkindo said, adding that the group "rose to the challenge," by implementing hefty production cuts.

When it became clear that turning on the taps was not a good idea, Opec and its non-Opec partners (Opec+) agreed to cut production drastically as of May 1. The group agreed to reduce output by 9.7 million b/d for May, and Saudi Arabia, Kuwait and the UAE will cut a further 1.2 million b/d in June. Negotiations with other oil producers, including the US, have led to further reductions. US producers, who have pushed output to 13 million b/d from their shale oil fields, are expected to cut up to 3 million b/d by the end of the year.

"The outlook for the second half of the year is beginning to look encouraging and positive that there will be a rebound," Barkindo said.

As restrictions on movement eases, people are returning to their cars and China oil purchases are resuming, but predictions that the second half of 2020 will see a stride back to normal may not materialise.

The surplus in stocks is just too huge. And a resurgence in the coronavirus could push any gains in the oil market back to where they were a month ago.

Executive Director of the International Energy Agency (IEA) Fatih Birol said in a recent energy publication interview that oil producers might need to make further cuts in production. "Demand will not jump from one day back to levels we had before the crisis and we will still have a huge amount of surplus, and plus a lot of floating oil," he said.

In its latest monthly oil market review, the IEA forecast that global demand for oil during 2020 would fall by 8.6 million b/d. Commenting on the report, Birol said: "We are seeing the early signs of a start of a recovery, but it is far too early to say we are soon going to reach the rebalancing of the markets." He encouraged oil producers to consider cutting output even more.

The oil industry is perhaps experiencing its most historic year. It's down, but not out. Yet the coronavirus has shaken the entire industry and all the other industries connected with it, and provoked questions about its future role in a world confronting not just a pandemic, but also climate change.

Gas

Despite huge gas deposits, Iraq struggles to cut reliance on Iranian supplies

The restriction on trade with Iran due to US sanctions is forcing Iraq to develop domestic gas supplies for power generation but there are significant hurdles.

David Gregory

Under US pressure, Iraq is struggling to end its reliance on neighbouring Iran for supplies of natural gas that keep the power generators running in much of the country. Since the ill-conceived invasion of Iraq in 2003 by the administration of former US President George W Bush, and the subsequent mismanaged attempt by Washington to bring democracy to Iraq, the influence of Iran within the majority Shia Muslim community in Iraq has solidly established itself. One example of this is the supply of natural gas to Iraqi power stations and the import of electricity.

That arrangement was palatable to Washington until US President Donald Trump withdrew the US from the Iran nuclear accord and re-imposed international sanctions on Iran that included a ban on exports of Iranian hydrocarbons. Since November 2018, the US has forced Iran's trading partners to halt much of their dealings with Iran, including the purchase of oil and gas.

This has been the case for Iraq, which has come to rely on Iranian gas to keep the lights on and air-conditioners running. In the recent past, there have been large and sometimes violent demonstrations in southern Iraq when cities were left without electricity. In order to forestall civil unrest, the US continues to issue waivers to Iraq, allowing it to continue to import Iranian gas.

Washington issued its latest waiver to Iraq – one for 30 days – at the start of May. Another will be needed by early June. Usually waivers have been issued for periods of three to four months. The plan is to keep pressure on Iran and to also push Iraq to prove that it is taking steps to expand its own power generation capacity and develop its own natural resources, and reduce its business with Iran. The US believes that Iraqi individuals are taking advantage of the waiver system in order to channel money into Iran. Many political factions in Iraq want close relations with Tehran.

There is no shortage of gas in Iraq, the second largest oil producer within Opec. The problem is that historically, natural gas associated with oil production has been flared due to the fact that the infrastructure to process gas and generate electricity does not exist.

According to the International Energy Agency (IEA), Iraq flared 10 billion cubic metres (bcm) of gas annually until 2010. The IEA has criticized Baghdad for not making better use of the 16 bcm it flared in 2018. The agency pointed out that Iraq could save billions of dollars annually and provide electricity to millions of homes and factories. The gas flared that year could have generated 4.5 GW of gas fired power, according to the IEA.

According to the World Bank, Iraq is now flaring 18 bcm/year of associated gas, produced as it pumps about 4.5 million bpd of crude, its almost sole source of revenue.

Former Iraqi Oil Minister Thamir Ghadhban told an energy conference in London last year that it would likely take Iraq until 2022 before it will have the infrastructure capability to stop flaring. More recently, the country's former Minister of Electricity, Luay al-Khatteeb, told S&P Global Platts that it would take years before Iraq would be able to develop oil and gas infrastructure that would enable it to stop importing Iranian gas.

"Those three to four years need to be an uninterrupted timeline with a government that enjoys full executive authority and no interference from political entities and in an environment that is welcoming to investments and multinational participation," Khatteeb was quoted as saying.

Iraq can import up to 1.2 GW of electricity annually and some 1.2 billion cubic feet per day during the peak summer season when the temperature can reach 50°C. Power supply in 2019 amounted to some 19 GW and should reach 20 GW during 2020. However, peak demand is expected to reach 25 GW.

In late April, Iraqi media reported that the Ministry of Electricity had announced that gas and electricity imports from Iran had declined by 75 per cent and that Iraq was nearing self-sufficiency in power generation.

Negotiations have started between Baghdad and the Kurdish Regional Government (KRG) in Iraqi Kurdistan, which has its own oil and gas policy. The KRG supplies power to its own towns plus Mosul and Kirkuk from its gas fields and power stations. However, building gas pipelines to transport Kurdish gas to central and southern Iraq could take considerable investment and several years.

Grid edge tech: the energy transition's latest frontier

Having made the first experiences with grid edge technologies, DSOs are now starting to implement even more intelligence at the edge. **Nick Merricks**

The decarbonisation, decentralisation and digitalisation of the energy mix has already redefined the way in which we produce, consume and distribute power and yet the energy transition is only just beginning.

However, the transition is quickly reaching a critical mass. The International Renewable Energy Association recently announced that nearly three quarters of global investment in power generation was in renewable sources. And closer to home, for the first time ever in Q1 2020, renewable power was the UK's primary source of energy thanks to the wind revolution and deployment of more solar power.

What's more, with the mass deployment of electric vehicles looming on the horizon and exponentially increasing demand, usage patterns are destined to change even further. This intermittency and variable demand bring a string of well-documented challenges, including the growing need for highly flexible, data-driven grids.

Now more than ever utilities need secure, flexible and scalable solutions with a high degree of automation and intelligence all the way down to the grid edge. Smart meters acting as grid edge sensors have already proven themselves capable of both, sending real-time data back to system operators and enabling greater customer engagement. As grid edge intelligence is becoming a key enabler of the low-carbon transition, meters will be critical components of the future electricity system.

Distribution system operators, or DSOs, were some of the first movers in deploying grid edge technologies. Scalable 'Internet of Things' connectivity platforms enable monitoring and control at the grid edge and are designed to help utilities leverage intelligence at the community level and across the distribution system, to increase overall system efficiency. An example of how grid edge intelligence helps DSOs optimise their grid operations is the implementation of grid analytics that combine information from smart metering systems and other data sources. These data sources can include the geo-information system and utilities' investment tools. Such applications enable more accuracy in grid planning, better transparency in grid operation and more focused investments in the low voltage distribution network.

Having made the first experiences with grid edge technologies, DSOs are now starting to implement even more intelligence at the edge. New intelligent end-points can process measured data themselves and produce alarms when for example power quality standards are violated. Such information is invaluable to DSOs in a system where measures of stability such as inertia, which were once guaranteed, are now increasingly unpredictable.

Another challenge for DSOs is the impact of households installing small scale renewable generators on local voltage levels in the low voltage grid. For example, a newly installed PV system can increase the voltage levels dramatically when producing at 100 per cent during low load periods, like on a Sunday morning. In such instances the smart meter at that connection point needs to be used to eliminate possible voltage violations, sending a command to the solar panel's inverter when voltage measurements indicate a risky situation, instructing it to compensate with reactive power and, if necessary, decrease active production.

By accessing data from neighbouring meters, DSOs can now also easily check whether a service quality problem flagged by a local alarm is on the grid side or on the customer side. With this capability, they can take the necessary action to guarantee grid stability, mitigating unnecessary conflicts with industrial customers.

Households' active participation in the energy system is not confined to behind-the-meter generation like rooftop solar. Consumer access devices are already in peoples' homes in the form of connected fridges, washing machines and products like smart thermostats. The consumption of such products can be identified by applications implemented in smart meters like Sense Intelligence and increase consumers' awareness about which appliances, equipment and furniture in the home are driving the demand and enable them to monitor and optimise it.

This data can then be reviewed and analysed by suppliers, enabling the customer to take a deeper look into whether they are using energy during peak times and then make an informed decision about the best time to schedule high-consumption tasks, like loads of laundry or running the dishwasher.

Seeing and showing where energy is being used in the home can create opportunities to reduce consumption. The forecast popularity of time-of-use tariffs will capitalise on the data provided by these grid edge technologies, shifting load in line with the peaks and troughs of renewable generation and network demand.

The UK already sees load-shifting at a formative level with Economy 7 contracts and now some suppliers have introduced dynamic pricing schemes. Tariffs such as these will become increasingly important as the power transformation under way in the transport sector comes to fruition.

The incremental load an electric vehicle places on the distribution system is roughly equal to that of a new home, therefore much more data and information will be required to ensure that the distribution grid is able to handle the demand, which is destined to increase dramatically.

Central to this is the need for smart charging to balance the intermittency of what will increasingly be a renewables-led generation system, a sentiment which was echoed in the EV smart charging consultation that the UK's BEIS issued in July last year, which commenced their programme of work in earnest.

In the future EVs are likely to be the largest load in domestic premises, dominating households' usage. In the drive to increase domestic flexibility it will be logistically easier to manage this single, large, output than the multitude of smaller devices – such as fridges, freezers, washing machines and dishwashers – that will otherwise have to be managed.

However, to deliver the scale of infrastructure necessary at a low cost to the consumer whilst encouraging individuals and businesses to switch to electric vehicles, coordination between industry and government with the right regulatory framework will be essential.

Furthermore, the security of infrastructure is critical. A growing concern is the deployment of charge-points, which lack a joined-up communications and security framework. Without this framework there is a risk that sufficient 'insecure' smart chargers could be installed, which will pose a significant cyber threat to the power grid.

The infrastructure deployed under the smart meter roll-out, including the communications networks and industry frameworks, provides a prime opportunity to efficiently and effectively support the widespread deployment of electric vehicle smart-charging infrastructure. Crucially this network is secure, proven and readily available – not just an off-the-shelf solution, it's a tailored solution which now simply needs scaling up.

This communications network underpinning the roll out of smart meters has been painstakingly developed in conjunction with the full spectrum of stakeholders and as a result is as robust as it is practicable. Having such a network readily available for smart charging of electric vehicles represents the lowest cost option for consumers, government and industry alike by avoiding the build-out of an equivalent nationwide solution.

Building on the smart meter network for electric vehicle smart charging would help governments to deliver on their policy objectives to accelerate the growth of the EV market and, ultimately, deliver a net zero economy.

With the right support and a robust security framework from government, industry can act with urgency on deploying comprehensive, secure infrastructure to support the growth of electric vehicles.

Of the decarbonisation, decentralisation and digitalisation mega-trends at play in the UK power market, two are already building momentum thanks to the shovel-ready nature of renewable power. But it is smart metering's foundational technology which is only now being realised through the grid edge technologies that will have a materially beneficial impact on both consumers' lives and on the environment. Smart metering has provided the data and the secure infrastructure necessary for the full digitalisation of the energy system, enabling decarbonisation and decentralisation of power.

The grid also needs to be able to cope with the scaling up of power loads, which will include the communications, digital and governance infrastructure needed to enable the widespread deployment of electric vehicles and smart chargers. Utilising the data from intelligent end-points at the grid edge, such as smart meters, sensors and connected IoT devices, helps to develop new, data-driven use cases. It also offers increased transparency and control to the distribution grid, new consumer services, and opens up new business models for operational efficiency.

Getting the governance right to effectively manage this infrastructure and the data it will yield is essential. As with smart metering, the infrastructure will be best delivered with direction from government taking an active role. Building on the smart metering model for EVs and other grid edge technologies will bring our low-carbon future closer, faster.

As utilities and third parties learn to capitalise upon these foundational technologies and navigate emergent frameworks, the full benefits of smart metering will be realised.

Nick Merricks is Head of UK Smart Electricity Meter Products at Landis+Gyr.

Merricks: As grid edge intelligence is becoming a key enabler of the low-carbon transition, smart meters will be critical components of the future electricity system

Batteries react to network needs

A project is under way, which for the first time will enable batteries on the UK distribution network to automatically provide reactive power services to National Grid ESO's transmission network. **Junior Isles** explains.

The increasing use of variable renewable energy sources is making it increasingly difficult to maintain stable grid voltage. Today, grid operators make use of reactive power from network devices and synchronous generators to provide this voltage stability. In March, however, a project was unveiled that could see batteries used to provide a reactive power service as part of a landmark trial in the South East of England.

Zenobe Energy will use batteries with a 10 MW capacity in its Kings Barn facility in Sussex to provide a reactive power service to National Grid Electricity System Operator (ESO), via UK Power Network's (UKPN) distribution network. This is part of the 'Power Potential' project, a world-first project to enable generators on the distribution network to automatically provide reactive power services to National Grid ESO's transmission network.

Traditionally, voltage support is provided by network infrastructure devices such as shunt reactors for static voltage control, as well as static VAR compensators (SVCs) and static synchronous compensators (STATCOMs) for dynamic voltage control. Reactive power and can also be provided by synchronous generating assets on the transmission network, where network operators can either obtain reactive power straight from a generator as part of the generator's obligatory service under the grid code or buy additional reactive power from the market.

Commenting on the existing approach Dr. Biljana Stojkovska, National Grid ESO, Power Potential Project lead, said: "These are well known, reliable technologies but we are starting to lose the number of synchronous plants connected to the grid and you cannot keep on connecting network devices due to network constraints and costs. We therefore wanted to look for alternative sources of voltage support."

Ned Ponsonby, Senior Associate at Zenobe Energy, says that batteries could now be one of a number of new DER market options. "There are now a number of batteries on the network. There are also a number of banks of solar inverters, some of which are connected to batteries, that have some reactive range at night when the sun's not shining. So there's now a whole load of aggregated assets across the distribution network that can be used to avoid having to install network assets that involve a significant amount of cash."

The Power Potential project is part of Ofgem's Innovation Network Innovation Competition (NIC), which is providing £10 million in funding. It kicked off in 2017, prompted by voltage stability problems that National Grid was having on the transmission system in the South East where there is a large amount of renewables connected to the grid.

National Grid ESO was facing two issues caused by renewables – high voltage occurrences in the network and low voltages. While the high voltage occurrences were manageable, addressing low voltages was a bigger problem. The potential loss of a double circuit line on the South East coast, which could cause a low voltage profile that is outside the operator's operational limit, was the real driver for the Power Potential project.

According to Dr Stojkovska, the trial will determine whether small distributed generators on the distribution network can provide voltage support to the transmission system with the same technical characteristics as transmission-connected systems and provide the same services they provide.

The battery used in the project is a 10 MW lithium-ion unit, which sits on UKPN's 33 kV grid supply point near Bolney.

Describing the battery's functionality, Ponsonby said: "Because they have to import or export quite significant energy, their inverters have a very wide range – their reactive power range could be as wide as their active power range. As a general rule, whatever you are not using with your active power set-point, you can reach with your reactive power set-point. Our batteries tend to be used for frequency response, which means that for 95 per cent of the time around 10 per cent of its active power range is being used, waiting for that five per cent of the time when the frequency moves out of that safe zone. So for a significant amount of time, they have under-utilised reactive power that they can achieve."

While Zenobe did not need to make significant modifications to the batteries it bought in, it has put significant effort into creating software to enable it to "stack" the reactive power service on top the fast frequency response (FFR) service so both can happen at the same time. The company is now able to communicate what can be utilised in terms of reactive power through the UKPN system all the way through to a control engineer at National Grid ESO.

Ponsonby said: "There were two main things that really brought the project to life. One is clever market design that allows different participants to stack incremental revenue that is not core to what they do. But on top of that, a lot of the effort and money has gone into developing software. National Grid ESO has some software called the Ancillaries Services Dispatch platform, which was designed to enable non-balancing mechanism participants to join the STOR market and Fast Reserve market. This software has been adapted and links the National Grid ESO control room engineer to the UKPN distribution network control centre, so they can see how much reactive power they can draw from a network they don't control."

Dr. Stojkovska added: "There are things that we need the battery control system to do: like can it react in 2-5 seconds once it receives the signal from us and move [the reactive power] from one point to another once it has been told where it is needed?"

Trials to prove the concept were originally planned to start on March 31st but were put on hold due to the coronavirus lockdown. NG ESO says it hopes they can resume on September 1st.

"There will be 10 weeks of technical trials to see how the battery reacts to changes in voltage profiles set by National Grid ESO," said Dr. Stojkovska. "Once we have completed technical trials, we will have 15 weeks of market trials, where we will simulate auctions for these DERs, who will be in competition with each other, submitting bids in the day-ahead reactive power market. We will see how the market works, looking at what price they are prepared to bid. We will simulate the market for them so they can prepare for the real market, which we will try to run after the project finishes."

Another important aspect of the trial, says Zenobe, is that it will help UKPN demonstrate that it is no longer purely a network operator but is a distribution system operator that is "using the system in a smart way".

If the project is successful, National Grid ESO estimates that it could provide significant savings. "If this is successfully implemented in the South East and the benefits are multiplied across Great Britain, we calculate the benefits to consumers would be around £400 million. This will come from avoiding or delaying installation of new network infrastructure devices," noted Dr. Stojkovska.

As the first-of-a-kind, the project is clearly significant. It gives TSOs an alternative way of providing voltage control, while giving small generators the opportunity of an additional revenue stream.

Zenobe believes the cost of providing reactive power is expected to increase year-on-year as conventional generators, capable of providing reactive power, are used less. This is an opportunity to earn from providing reactive power as well as other services such as black start in a green way. Ponsonby cited a pathfinder project in the Mersey, where batteries will be used to shore-up the system following the closure of the Fiddler's Ferry coal fired station.

James Basden, Founder Director of Zenobe Energy, summed up: "The market for reactive power is growing fast and will be much bigger than FFR. For example, Mersey grid is looking for 229 MVARs of support and will probably buy significantly more than that so they are not dependent on any one provider or substation. In September National Grid ESO will come out with a Request for Proposals that is expected to be in excess of over 1 GW of reactive power support and assets on the distribution network can also come in… It's a not a particularly large revenue source in a revenue stack but when you have a fixed cost base, that incremental additional revenue drops straight to the bottom line and is therefore an attractive thing to get involved in."

National Grid ESO control room engineers will be able to see how much reactive power they can draw from the UKPN distribution network

Junior Isles

Every day is like Sunday

Since lockdown, it's been like Groundhog Day; each day seems much like the next. And in the electricity sector it has been… literally.

In late April, the International Energy Agency (IEA) released its 'Global Energy Review 2020', which analyses the impacts of the Covid-19 crisis on global energy demand and carbon dioxide (CO_2) emissions.

Needless to say the results of the impact have been extraordinary. Based on an analysis of more than 100 days of real data so far this year and 200 days of projections, the IEA's Global Energy Review includes estimates for how energy consumption and CO_2 emissions trends are likely to evolve over the rest of the year.

Although the impact of the crisis on energy demand depends heavily on the length of lockdown measures and how strictly they are imposed, the report's findings are stark and certainly unprecedented. It projects that energy demand will fall 6 per cent this year – seven times the decline after the 2008 global financial crisis.

Looking more specifically at electricity, the IEA says changes to electricity use during lockdowns have resulted in significant declines in overall electricity demand, with consumption levels and patterns on weekdays looking like those of a pre-crisis Sunday.

Full lockdowns have pushed down electricity demand by 20 per cent or more, with lesser impacts from partial lockdowns. Looking out to the end of the year, the IEA predicts that electricity demand is set to decline by 5 per cent in 2020, the largest drop since the Great Depression in the 1930s.

The IEA's bleak projection assumes a very gradual easing of lockdowns globally and a U-shaped, slow economic recovery. Laura Cozzi, IEA Chief Energy Modeller, said: "This is assuming a global decline in GDP of around 6 per cent, which is in line with what the IMF has put forward in terms of their longer lockdown case."

The IEA noted that major uncertainties surround the economic outlook, such as the trajectory of the pandemic, the effects and duration of virus containment measures, reopening strategies and the shape and speed of recovery as the pandemic recedes. These are downside risks that will affect the return of electricity demand.

"We are tracking electricity demand very closely," said Cozzi. "If China is an indication of what is waiting ahead for other countries, we see that it is starting to see positive growth but it's very much lower compared to normal times… For the year, we are still expecting an overall decline for electricity demand," said Cozzi.

The lockdowns have not only severely hit electricity demand, they also appear to have accelerated the shift towards low carbon sources including wind, solar PV, hydropower and nuclear.

"For the first time, we are seeing that low carbon sources, i.e. nuclear and renewables, are the number one source of electricity generation, overtaking coal for the first time in history," said Dr Fatih Birol, the IEA Executive Director. "It is still too early to determine the longer-term impacts, but the energy industry that emerges from this crisis will be significantly different from the one that came before."

Of all the energy sources, only renewables has seen any growth since the outbreak. According to the IEA, renewable energy demand increased by about 1.5 per cent in Q1 2020, lifted by the additional output of new wind and solar projects that were completed over the past year.

The apparent resilience of the sector can partly be attributed to favourable policies and the market mechanisms that are in place. In most cases, renewables receive priority in the grid and are not asked to adjust their output to match demand, insulating them from the impacts of lower electricity demand. As a result, the share of renewables in the electricity generation mix rose considerably, with record-high hourly shares of variable renewables in Belgium, Italy, Germany, Hungary and eastern parts of the United States.

Speaking during the report's launch, Cozzi said: "What is happening during this outbreak is a combination of two things: lower electricity demand on one hand, and on the other, we want to use the cheapest electricity option possible. Most countries are giving priority dispatch to renewables, which means our electricity nowadays is cleaner. But when demand rebounds, other forms of generation will come back online. We are currently benefitting from [renewables] installations that were made last year and government support will be needed if we want to see further growth in the year ahead."

There is an argument that Covid-19 could in fact be a catalyst for the energy transition and one that really sets the world on an accelerated, irreversible path to renewables.

In a recent webinar 'The Energy Transition: the knowns & unknowns' Carbon Tracker presented a follow up to the 2019 report 'Speed of the Energy Transition' by the World Economic Forum Global Future Council. New Energy Strategist for Carbon Tracker, Kingsmill Bond, who is one of the authors of that report and member of the World Economic Forum Global Future Council on Energy, addressed the impact of Covid-19 on the energy sector.

He said: "It's very clear to us that the Covid-19 [outbreak] will speed up the energy transition, in spite of the best attempts of fossil fuel lobbyists to roll back regulatory pressures... the coronavirus has significantly reduced the power of the fossil fuel industry to lobby against change because many of these companies are now looking for government support, and furthermore it gives unprecedented power to governments to allocate the spare resources of society. There have been quite a few reports talking about a green build-back."

Indeed in early May the UK's Committee on Climate Change (CCC) sent a letter to the government setting out six key principles to rebuild the nation following the pandemic whilst delivering a stronger, cleaner and more resilient economy. Reducing greenhouse gas emissions and adapting to climate change are integral to the UK's recovery package, the Committee said.

One of the six key principles is to strengthen incentives to reduce emissions when considering tax changes. The CCC says revenue could be raised by setting or raising carbon prices for sectors of the economy that do not bear the full costs of emitting greenhouse gases. It said low global oil prices provide an opportunity to increase carbon taxes without hurting consumers.

Bond added: "Policymakers will use whatever the most effective tool is to get their economies up and running again. Ten years ago, after the financial crisis, that meant throwing money at coal fired power stations. Today, that means throwing money at expanding the grid and building renewable energy systems because they're cheaper. And that's the big difference. Actually we are in an unusual position where in this debate we can have our cake and eat it. Yes we want to do the right thing, and yes we want to have the best bang for buck; and it happens to be, in both cases, a renewable energy shift."

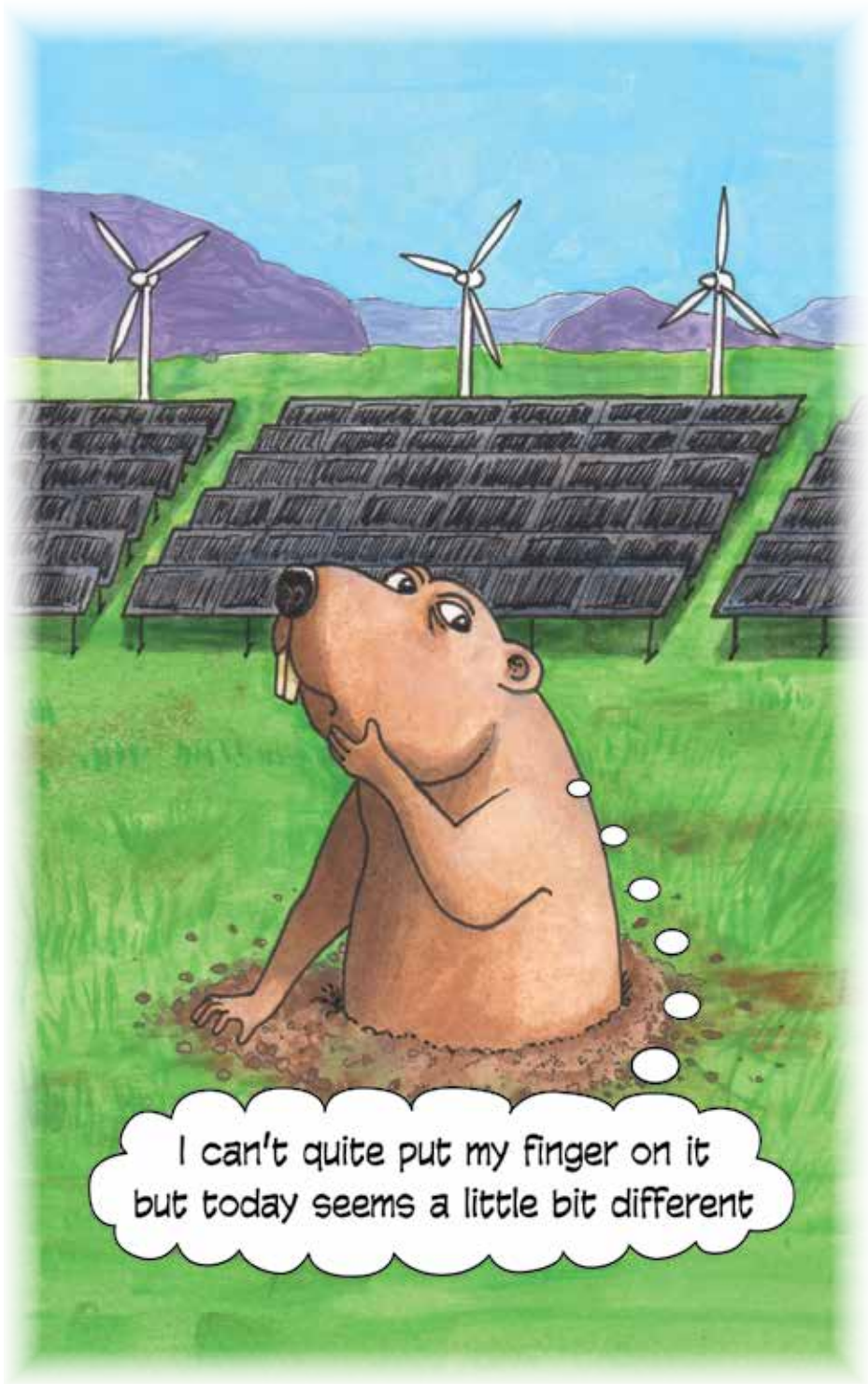
While the outbreak has served to decimate global emissions, there are fears that its economic impacts might divert governments' attention away from the need to keep up the pressure on tackling climate change. There is also the likelihood that as economies rebound, so too will emissions.

The IEA report predicts there will be a record decline in annual carbon emissions of almost 8 per cent. "We have seen the largest decline in emissions in history but it is not a historic success because it is happening for the wrong reasons," said Dr Birol, noting that it has come off the back of "thousands of premature deaths and economic trauma". He added that for emissions to continue downwards, the "right government policies" are required.

The IEA is therefore trying to convince governments to make clean energy policies part of their stimulus packages. "This," said Dr Birol, "will also help job creation improve the economy and boost the resilience of the energy infrastructure."

As Winston Churchill once said, never let a good crisis go to waste. For energy ministers and policymakers, the pandemic presents an opportunity. The goal has to be for electricity demand to rebound strongly, but without the potential associated carbon emissions.

Let us hope that a return to business as usual does not mean tomorrow's energy sector looks exactly the same as yesterday's.



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