

WORLD POWER SYSTEMS REVIEW

15 April 2022

1 April 2022

Enel Green Power signs grant agreement with the EU for solar panel gigafactory in Italy

Enel Green Power (“EGP”) and the European Commission signed the grant agreement, under the framework of the EU’s first Innovation Fund call for large-scale projects, that will contribute to the development of TANGO (iTaliAN pv Giga factOry), an industrial-scale production facility for the manufacturing of innovative, sustainable and high-performance photovoltaic (PV) modules at EGP’s 3Sun solar panel factory in Catania, Sicily. In line with the deal, the factory’s expansion is set to result in a 15-fold increase in its production capacity to 3 GW per year from the current 200 MW. The 3 GW production facility is expected to be fully commissioned by July 2024, after starting with the first 400 MW in September 2023, making 3Sun Europe’s largest gigawatt-scale factory producing high-performance bifacial PV modules.

The total investment in the creation of the 3 GW production facility amounts to around 600 million euros, whereby EGP’s commitment will be coupled with EU funding in the amount of nearly 118 million euros. This investment is expected to increase local direct and indirect employment by approximately 1,000 jobs by 2024, alongside acting as a catalyst for the relaunch of a European PV value chain.

“The global world demand of solar PV modules is growing at an accelerated pace,” said Francesco Starace, CEO of the Enel Group. “Europe alone is expected to absorb a large portion of additional demand thanks to the great competitiveness and convenience of this technology. The sourcing footprint of these important components is a weak point in the global supply chain and we see the need to rebalance its geographic spread that is today excessively dependent on a single Asian source. This investment will place 3,000 MW per year of production capacity back in Europe and will mark for Italy a big step in retaining leadership in technology.”

“The TANGO project will contribute towards the achievement of EU’s increased ambitions of 40% energy consumption from renewable sources by 2030, alongside helping reduce energy dependency,” said Salvatore Bernabei, CEO of Enel Green Power. “The Gigafactory will promote a circular economy concept, creating a more sustainable and resilient European supply chain, from the design phase to the new models of reusing components at the end of their life cycle.”

3Sun’s production will include bifacial heterojunction (B-HJT) PV cells that capture more sunlight as the cells can respond to light on both front and rear surfaces. Through an ambitious R&D program, the PV panels will be further developed to also incorporate a structure called “Tandem”, which utilizes two stacked cells that allows for more light to be captured compared to single-cell structures, yielding higher overall efficiency. The combination of bifacial PV panels and “Tandem” cell structure offers significant efficiency improvements, which will enable PV modules to exceed 30% efficiency, securing higher average energy production.

The 3 GW of panels to be manufactured every year by the Gigafactory can generate up to an approximate 5.5 TWh of renewable electricity per year, which from a sustainability point of view have the potential to avoid the equivalent of up to almost 25 million tons of CO2 in their first ten years of operation. Likewise, the output generated by the Gigafactory’s panels has the potential to avoid the purchase of up to almost 1.2 billion cubic meters of gas per year, replaced by domestically-produced renewable energy.

The Gigafactory is being designed and constructed following sustainable and circular best practices by increasing the use of environmentally-friendly, recycled material, reducing energy and resource consumption.

WORLD POWER SYSTEMS REVIEW

15 April 2022

Furthermore, the factory is fully engaged in R&D in collaboration with international research centers, leading companies in the sector and start-ups, with the aim to develop new recycling processes for end-of-life PV modules management through the recovery and reuse of materials in a fully circular perspective. For example, the use of highly automated procedures as well as of sophisticated artificial intelligence algorithms will greatly improve the control of manufacturing processes, leading to significant scrap minimization.

Enel

<http://www.enel.com>

1 April 2022

TEPCO to grow fish at nuclear plant to show water safety

Tokyo Electric Power Co. will raise seafood at its stricken Fukushima No. 1 nuclear power plant in a bid to ease concerns about its plan to release treated radioactive water stored there into the ocean.

“We want to contribute to dispelling the public’s anxiety and reassuring people,” a TEPCO representative said. The government and TEPCO last year announced the plan to treat and then discharge contaminated water accumulating at the nuclear plant into the ocean starting as early as spring 2023. More than 1 million tons of water have already been stored.

Local residents and fisheries industry officials, worried about reputational damage to marine products caused by the water release, asked the utility to demonstrate the safety of the water that will be discharged instead of just spouting off technical terms. They suggested that TEPCO keep fish at the plant to show that the processed water will pose no health risk. The water treatment process removes most radioactive substances, but not tritium. The water will be diluted with seawater to reduce the tritium concentration to less than 1,500 becquerels per liter, one-40th the legal standard. On experts’ advice, TEPCO decided to culture flatfish and abalone on a trial basis because both species can be caught off Fukushima Prefecture and grown easily.

Preliminary farming started in March in seawater at the plant to gain expertise. Around September, the utility will begin growing 600 flatfish and 600 abalone. Some will be raised in ordinary seawater while others will be in treated and diluted water containing tritium at the same level of the water that will be discharged. The concentration of tritium and other substances in the creatures’ bodies will be analyzed, as will their growth rates in the two sets of tanks.

A continuing video of the experiment will be made available on the internet. TEPCO said it expects the raised fish to have tritium readings similar to those in the water of their farming tanks. So the figure for flatfish raised in the processed water will likely be higher than their seawater-cultivated counterparts. “We hope to counter negative publicity by showing that fish can grow healthily (in the treated water),” a TEPCO official said.

ASAHI

<http://www.asahi.com>

2 April 2022

French power grid operator asks users to cut consumption on Monday

French power grid operator RTE warned on Saturday of a potential "tense" situation between the supply and demand of electricity in the country in the wake of the cold wave that has hit Europe.

WORLD POWER SYSTEMS REVIEW

15 April 2022

RTE issued a statement asking French companies and local authorities to reduce their energy consumption in particular between 7 a.m. (0500 GMT) and 10 a.m. on Monday. It also asked households to push up the use of their appliances on Saturday and Sunday.

RTE said that the electricity consumption may reach 73,000 megawatt (MW) on Monday morning, while the production of electricity may reach 65,000 MW. France may import up to 11,000 MW as a result, RTE said. The grid operator doesn't expect any power cut and will update its forecast on Sunday, it said.

In February the company said it was necessary to maintain a heightened level of vigilance in case of a cold wave lasting several consecutive days, low wind production or a sharp decline in nuclear availability.

Reuters

<http://www.reuters.com>

3 April 2022

Turkiye's daily wind power generation hits all time high on Saturday

Electricity generated through wind energy in Turkey hit an all-time record Saturday, generating 25.42% of total power, according to data from the Turkish Electricity Transmission Corporation (TEİAŞ) on Sunday. The country produced 203,069 megawatt-hours (MWh) of electricity from wind farms on Saturday, according to data provided by TEİAŞ.

The latest record was on April 1 when the country produced 189,258 MWh of electricity from wind farms. Wind plants were followed by lignite and hydroelectricity plants with each contributing 17% and 11.58% to electricity production, respectively.

Meanwhile, daily electricity production amounted to 798,857 MWh on Saturday, while daily electricity consumption in the country totaled 801,248 megawatt-hours on the same day. Hourly power consumption peaked at 36,188 MWh at 12 p.m. (9 a.m. GMT), data from TEİAŞ showed. The country's electricity usage dropped to the lowest level of 27,997 MWh at 8 a.m. local time (5 a.m. GMT). On Saturday, Turkey's electricity exports amounted to 9,757 MWh and imports totaled 12,149 MWh.

Daily Sabah

<http://www.dailysabah.com>

4 April 2022

Germany Seizes Control of Gazprom Unit to Secure Gas Supply

Gazprom Germania GmbH - owner of energy supplier Wingas GmbH and a gas storage firm - will come under the trusteeship of the German energy regulator until Sept. 30, Economy Minister Robert Habeck told reporters in Berlin. That means the Federal Network Agency will assume the role of a shareholder and can take all necessary measures to ensure security of supply, he said. The government won't ultimately take ownership of the company.

Gazprom subsidiaries in Europe are coming under pressure as clients and business partners refuse to do business with them, raising the prospect that some won't survive. Gazprom Germania's Astora unit operates Germany's biggest gas storage facility in the northern town of Rehden in the state of Lower Saxony. The site is considered key to Germany's energy security.

"The federal government is doing what is necessary to ensure security of supply in Germany," Habeck said in a statement on Monday. "This also means that we do not allow energy infrastructures in Germany to be subject to arbitrary decisions by the Kremlin."

Gazprom said on Friday it no longer owned its German subsidiary, which also has a trading arm in the U.K. and units from Switzerland to Singapore. The Russian gas giant

WORLD POWER SYSTEMS REVIEW

15 April 2022

didn't disclose the new ownership, but regulatory filings showed the transaction involved exiting Gazprom Export Business Services LLC, the owner of Gazprom Germania. In turn, a company called Joint Stock Company Palmary became a shareholder of Gazprom Export Business Services LLC.

It isn't clear who the ultimate beneficial owner of Palmary is: it was registered in October at a Moscow address, and since March 30 its general director was Dmitry Tseplyaev, according to the Russian business register.

Habeck said the Russian gas giant exited the German subsidiary without seeking government approval, violating German foreign trade law.

It's unclear what happens after Sept. 30, and what implications that will have for Gazprom Germania's subsidiaries from the U.K. to Singapore. The German unit also owns a London-based trading arm and Gazprom Energy, a retail provider that the U.K. government plans to nationalize in the event it fails.

Bloomberg

<http://www.bloomberg.com>

4 April 2022

To enhance reliability, Texas regulators will consider standardizing distribution system interconnections

The Public Utility Commission of Texas will consider standardizing the distribution system interconnection process for storage and distributed energy resources, in an effort to bring more clean resources onto the grid, increase the system's reliability and ultimately count DERs towards the resources required to ensure reliability.

The commission has good visibility into utility-scale projects connecting to the transmission system managed by the Electric Reliability Council of Texas but "it is unknown how many megawatts of battery storage are seeking to interconnect to the distribution systems across ERCOT's utilities, municipal utilities and electric cooperatives," Commissioner Jimmy Glotfelty noted in a Wednesday memo.

The PUCT plans to examine "appropriate" timelines for the distribution interconnection process, the treatment of interconnection costs for energy storage interconnected at distribution voltage, whether storage resources should be subject to wholesale distribution service tariffs, and other issues.

Utility Dive

<http://www.utilitydive.com>

6 April 2022

Government future proofs Britain's energy system with launch of new body to boost energy resilience

The government has today committed to delivering a new public body to strengthen the resilience of Great Britain's energy system. The Future System Operator (FSO), to be launched once legislation is passed and timelines have been discussed with key parties, will look at the Great Britain's energy system as a whole, integrating existing networks with emerging technologies such as hydrogen.

The FSO will be a new public body founded on the existing capabilities of the Electricity System Operator (ESO), and, where appropriate, National Grid Gas (NGG). It will work with energy suppliers and networks to balance the UK's electricity systems and ensure continued energy resilience and security of supply for households and businesses. It will also provide strategic oversight of the UK gas system by taking on longer-term planning in respect of gas (but not real-time operation, which will remain with NGG).

WORLD POWER SYSTEMS REVIEW

15 April 2022

With high global wholesale gas prices and renewed pressure on energy networks following Russia's illegal invasion of Ukraine, consumers are facing increased costs and there is an urgent need to safeguard and boost domestically produced energy.

Today's announcement comes ahead of the forthcoming Energy Security Strategy to be published later this week which will set out our approach to ensuring greater clean energy independence for Britain. Government, Ofgem, National Grid and the ESO have agreed a joint statement published alongside this announcement, which sets out their shared vision for the FSO and their commitment to working together to deliver it.

Jonathan Brearley, chief executive of Ofgem, said: "A fully independent system operator will help to transform Great Britain's energy system and cut customers' energy bills. Critically, the FSO will ensure that we will build a smart, efficient and flexible system that will mean that Britain moves to a secure low carbon and low-cost system. We look forward to working with National Grid, government and the wider industry to implement this important change in the way the energy system is managed."

Fintan Slye, Executive Director, Electricity System Operator, said: "We warmly welcome today's announcement that the ESO will be at the heart of the system operator of the future. Building on our track record and skills as a world leading system operator, together with industry and government and regulators we will help deliver an affordable, reliable and clean transition for all."

The ESO will continue working closely with all parties involved in the coming weeks and months to enable a smooth and successful transition.

John Pettigrew, CEO, National Grid: "National Grid has a critical role to play in the decarbonisation of the economy to reach net zero, whilst continuing to ensure security of supply at the lowest cost to consumers. We have been working closely with government, industry and the regulator to create a Future System Operator that enables long-term holistic thinking, drives progress towards net zero, and lays the foundations for the regulatory reform necessary to deliver a clean, fair and affordable energy transition. We will continue to work closely with all relevant parties to ensure a smooth transition, subject to Parliamentary approval and conclusion of the transaction process."

The move aims to further build the resilience that energy providers and billpayers need. This will deliver greater energy security whilst ensuring the clean energy produced by the UK's burgeoning renewables sector gets to the homes and businesses which need it across the country. As a trusted and expert body at the centre of the gas and electricity systems, the FSO will take a significant role in shaping the energy system and facilitating competition, overseeing new projects and integrating them with existing energy supplies.

The announcement follows extensive consultation with the energy industry, where there was broad agreement that Great Britain needed a new public body with operational independence from government, to oversee developments across the UK's energy networks. The operator will take a whole-system approach to coordinating and planning the network, looking across electricity, gas and other emerging markets such as carbon capture, usage and storage, as well as offshore wind networks.

The FSO will also have a duty to provide independent advice and technical input to the government and industry regulator, Ofgem, to inform key strategic policy decisions. The consultation responses, published today, also give Ofgem a new strategic function overseeing energy companies' governance codes. This decision is expected to result in a long-term net benefit for industry and consumers, by ensuring that the detailed technical and commercial rules which guide energy providers keep pace with our net zero ambitions and deliver for UK consumers.

WORLD POWER SYSTEMS REVIEW

15 April 2022

6 April 2022

ESO at heart of new future system operator

We welcome today's announcement, by BEIS and Ofgem, to create a future system operator that builds on the track record and skills of the ESO with enhanced roles and responsibilities to unlock additional value for consumers and drive towards to net zero.

We are pleased to have signed a multi-party statement with BEIS, Ofgem and National Grid Plc. This statement shows our collective commitment to progressing the establishment of the Future System Operator.

Fintan Slye, Executive Director, Electricity System Operator, said: "We warmly welcome today's announcement and together with Government, the regulator, National Grid plc, and industry we will help deliver a reliable and clean transition for all."

The ESO will continue working closely with all parties involved in the coming weeks and months to enable a smooth and successful transition.

NGESO

<http://www.nationalgrideso.com>

7 April 2022

Scientists invent solar panels that work at night

A new type of solar panel has been developed that can generate electricity at night.

Researchers at Stanford University created a photovoltaic (PV) cell that uses a process called radiative cooling to allow for 24 hour renewable energy generation. It works by tapping into the heat being radiated from the surface of the solar cells as infrared light into outer-space on clear nights. By incorporating a thermoelectric generator into a conventional PV solar panel, the scientists achieved 50 mW/m² nighttime power generation.

Functioning like a conventional solar panel during the day to harvest the Sun's energy, the panel then "runs in reverse" to keep generating electricity at night, however any clouds at night can hinder the system by reflecting the infrared radiation back to Earth.

The team of engineers who built it said they used inexpensive and common materials to set it up, meaning it could be incorporated into existing solar cells and used in remote locations where resources are limited.

"What we managed to do here is build the whole thing from off-the-shelf components, have a very good thermal contact, and the most expensive thing in the whole setup was the thermoelectric itself," said Zunaid Omair, a metrology engineer from Stanford University who was one of the authors of the research.

The study detailing the technology, titled 'Nighttime electric power generation at a density of 50mW/m² via radiative cooling of a photovoltaic cell', was published in the journal Applied Physics Letters. The researchers hope provide a reliable and clean source of energy to the roughly 750 million people around the world who currently live without electricity. "Our system can be used as a continuous renewable power source for both day- and nighttime in off-grid locations," the study states.

Independent

<http://www.independent.co.uk>

10 April 2022

Power restored across Puerto Rico after island-wide outage

Power in Puerto Rico was restored on Sunday after an island-wide outage impacted some 1.5 million people, according to the company that manages its power grid.

WORLD POWER SYSTEMS REVIEW

15 April 2022

LUMA Energy's Sunday announcement said that 99.7 percent of customers had their power restored and work was ongoing "to stabilize the grid and reduce the future risk of intermittent power outages." The company said it was investigating the cause of the outage and would be "fully transparent with our customers, regulators, and the legislature" about the findings of that investigation.

"While this thorough investigation, which includes a thorough independent forensic review of the failed equipment, will take some time, there is no doubt that this event has exposed the fragility of the energy grid and how important it is for all of us to work together to improve grid reliability," LUMA president and CEO Wayne Stensby said in the statement.

After Hurricane Maria devastated the territory's electrical grid in 2017, LUMA took over transmitting and distributing power in Puerto Rico.

Puerto Rico Gov. Pedro Pierluisi (D) said in a tweet on Sunday that he would now "continue to focus on efforts to put an end to the fragility of the energy infrastructure and leave behind dependence on oil."

"We have started the complex process of transformation and reconstruction of our electrical system, since our people cannot continue to suffer the consequences of an old and obsolete system. That is my commitment," he added.

Roughly 90 percent of customers already had their power restored on Saturday. A fire on Wednesday at one of LUMA's largest power plants, known as the Costa Sur Power Plant, prompted the outage, according to multiple reports. The fire may have been related to a circuit breaker failure, though the cause was not confirmed.

The Hill

<http://thehill.com>

11 April 2022

IRENA: Renewables Take Lion's Share of Global Power Additions in 2021

New data released by the International Renewable Energy Agency (IRENA) shows that renewable energy continued to grow and gain momentum despite global uncertainties. By the end of 2021, global renewable generation capacity amounted to 3 064 Gigawatt (GW), increasing the stock of renewable power by 9.1 per cent.

Although hydropower accounted for the largest share of the global total renewable generation capacity with 1 230 GW, IRENA's Renewable Capacity Statistics 2022 shows that solar and wind continued to dominate new generating capacity. Together, both technologies contributed 88 per cent to the share of all new renewable capacity in 2021. Solar capacity led with 19 per cent increase, followed by wind energy, which increased its generating capacity by 13 per cent.

"This continued progress is another testament of renewable energy's resilience. Its strong performance last year represents more opportunities for countries to reap renewables' multiple socio-economic benefits. However, despite the encouraging global trend, our new World Energy Transitions Outlook shows that the energy transition is far from being fast or widespread enough to avert the dire consequences of climate change," says IRENA Director-General, Francesco La Camera.

"Our current energy crisis also adds to the evidence that the world can no longer rely on fossil fuels to meet its energy demand. Money directed to fossil fuel power plants yields unrewarding results, both for the survival of a nation and the planet. Renewable power should become the norm across the globe. We must mobilise the political will to accelerate the 1.5°C pathway." To achieve climate goals, renewables must grow at a faster pace than energy demand. However, many countries have not reached this point yet, despite significantly increasing the use of renewables for electricity generation.

WORLD POWER SYSTEMS REVIEW

15 April 2022

Sixty per cent of the new capacity in 2021 was added in Asia, resulting in a total of 1.46 Terawatt (TW) of renewable capacity by 2021. China was the biggest contributor, adding 121 GW to the continent's new capacity. Europe and North America—led by the USA—took second and third places respectively, with the former adding 39 GW, and the latter 38 GW. Renewable energy capacity grew by 3.9 per cent in Africa and 3.3 per cent in Central America and the Caribbean. Despite representing steady growth, the pace in both regions is much slower than the global average, indicating the need for stronger international cooperation to optimise electricity markets and drive massive investments in those regions.

Highlights by technology:

- Hydropower: Growth in hydro increased steadily in 2021 with the commissioning of several large projects delayed through 2021.
- Wind energy: Wind expansion continued at a lower rate in 2021 compared to 2020 (+93 GW compared to +111 GW last year).
- Solar energy: With an increase in new capacity in all major world regions in previous years, total global solar capacity has now outgrown wind energy capacity.
- Bioenergy: Net capacity expansion increased in 2021 (+10.3 GW compared to +9.1 GW in 2020).
- Geothermal energy: Geothermal capacity had an exceptional growth in 2021, with 1.6 GW added.
- Off-grid electricity: Off-grid capacity grew by 466 MW in 2021 (+4%) to reach 11.2 GW.

IRENA

<http://www.irena.org>

11 April 2022

Eon rules out German nuclear power plant extension

Eon has ruled out extending the life of its nuclear power plant in Germany, even as Europe's largest economy prepares for the rationing of energy supplies and to wean itself off Russian hydrocarbons. "There is no future for nuclear in Germany, period," said chief executive Leo Birnbaum. "It is too emotional. There will be no change in legislation and opinion."

Eon, which is Germany's biggest energy company, runs one of the three remaining nuclear sites in the country, near Munich. The Isar 2 plant is due to go offline by the end of the year as part of the country's longstanding phaseout of nuclear power production put in place after the 2011 Fukushima disaster in Japan. Russia's invasion of Ukraine in February seemed initially to prompt a rethink in Berlin, with Green economics minister Robert Habeck saying he would not stand in the way on ideological grounds of any decision to keep nuclear power plants running for longer.

But this option was soon ruled out, a decision Birnbaum said Eon was happy to accept. While Isar 2 could "technically" be kept operational beyond this year, "the judgment which was really done is we have a gas emergency situation and the little relief we might be getting on the electricity side is just not really a game changer", he said. "There was a really serious discussion with the government," he added. "They made a decent trade-off decision, which we can understand, and therefore the story for us is over."

The German government has been rushing to secure alternative energy supplies as part of its long-term goal to reduce its dependence on Russian fuel. Habeck recently signed deals with Qatar for the supply of natural gas and with the UAE for green hydrogen. Berlin last week activated the first step of an emergency plan that in the event of a gas shortage would eventually lead to gas supplies to large corporations being curtailed.

WORLD POWER SYSTEMS REVIEW

15 April 2022

However Eon, which buys its energy on the wholesale market and does not have direct contracts with Russian providers, has joined German industry in warning against a boycott of Russian gas, which Germany relies on for more than half of its annual consumption. Such a move would disrupt supply chains and interrupt economic activity “on a scale which I think is significantly more problematic than Covid”, said Birnbaum.

Even if small and medium-sized companies, which make up the bulk of Eon’s corporate customers, were not cut off in such a scenario, the impact on large groups such as chemicals giant BASF would have a “dangerous” effect on the rest of the German economy, he added. The chief executive also revealed that Eon’s domestic customers were so far not objecting en masse to higher energy prices. “I believe that there is an acceptance because we have seen now price rises in the market and we have seen little customer reaction,” he said. “Switching as a result of price increases has been extremely low,” he added. “There is an understanding that it’s an inevitable conclusion that if prices in the wholesale market quadruple or go up tenfold, then prices need to go up. So people understand that.”

Financial Times
<http://www.ft.com>

12 April 2022

Whitehaven coal mine decision expected by July

A deadline of July has been set for a decision on whether to go ahead with a new coal mine in Cumbria. In a letter seen by the BBC, the office of the Planning Inspectorate confirmed it had sent its completed report to Housing, Communities and Levelling Up Secretary Michael Gove. In it, a deadline of 7 July is set for him to issue his decision. If it goes ahead, it would be the first deep coal mine to open in the UK for more than 30 years.

In autumn, the Planning Inspectorate held a public inquiry into whether West Cumbria Mining could mine coking coal at the former Marchon chemical works site in Whitehaven, for use in steel making. The coal would not be used for power generation. Supporters claim it will create jobs and reduce the need to import coal.

The proposed mine would remove coking coal from beneath the Irish Sea for the production of steel in the UK and Europe. Copeland mayor Mike Starkie, who has previously said local support for a new mine is strong, said the process had “dragged on for over six years”. He said: “Now the planning inspector has completed his report which I hope - and expect - is a recommendation that the approval is granted immediately with no further unnecessary delay. “I would urge the secretary of state to approve the mine immediately - there is a clear demand for coking coal and approval will give a huge economic boost to west Cumbria. “It also supports both the government’s levelling-up agenda and the need to become more self-reliant. There is no need to delay approval for this mine a minute longer.”

Governing is about difficult choices; confronting seemingly irreconcilable demands - and making a decision. So, should the government say yes to a new coal mine in Cumbria, providing a domestic source of coking coal for the steel industry? Around 40% of the UK’s coking coal is currently imported from Russia. Or do promises to drive down carbon emissions make opening a new mine look ridiculous? There’s been disagreement and dither. Plenty of both. But now, for the first time, the government faces a deadline, the 7th July. By then it has to decide what to do.

Conservative MP Lee Anderson, a supporter of the project, has suggested boosting UK supplies of coking coal could help “put the squeeze” on Russian President Vladimir Putin over the war in Ukraine. In a Commons debate last month, he said: “if we can get it out of

WORLD POWER SYSTEMS REVIEW

15 April 2022

the ground cheaply and safely, we should do that without delay". Reacting to news of the July deadline, Friends of the Earth said the case against the coal mine was "overwhelming".

Victoria Marsom, a spokesperson for group, added that the UK's "abundant" sources of renewable energy were "the future", and could provide thousands of new jobs. Planning inspector Stephen Normington previously said he would make his recommendation in late December or early January. The mine was approved to operate until 2049 by Cumbria County Council in October 2020, but in February 2021 the authority suspended its decision.

West Cumbria Mining previously said exploratory works led it to estimate there were about 750m tonnes of "excellent quality" coking coal in the area. However, the company would be limited by planning conditions to produce no more than 2.78m tonnes a year.

BBC

<http://www.bbc.com>

12 April 2022

Giant undersea cables set to give the UK and Germany their first direct energy link

Key contracts totaling more than £1.5 billion (\$1.95 billion) have been awarded for a major interconnector project that will link Germany and the U.K., as countries around the world attempt to shore up their energy supplies amid the ongoing crisis in Ukraine.

The NeuConnect project is centered around subsea cables that will enable 1.4 gigawatts of electricity to pass in both directions between the U.K. and Germany — Europe's two largest economies. The interconnector measures 725 kilometers, or just over 450 miles. Those behind NeuConnect have dubbed the privately-financed venture an "invisible energy highway" and have described it as "the first direct link between the UK and German energy markets." The contracts that have been awarded relate to cabling works and converter stations. NeuConnect said Siemens Energy had been awarded the contract for the latter, which will involve the design and construction of sites in Germany and the U.K.

Monday's announcement said financial close on NeuConnect was slated for the "coming weeks," which would allow works to begin at some point in 2022. The project has been in the works for some time now, but its progression comes at a time when Russia's invasion of Ukraine has highlighted just how reliant some economies are on Russian fossil fuels. Indeed, while the war in Ukraine has created geopolitical tension and division, it has also resulted in a number of initiatives defined by cooperation and shared aims. The U.S. and European Commission, for example, recently issued a statement on energy security in which they announced the creation of a joint task force on the subject.

The parties said the U.S. would "strive to ensure" at least 15 billion cubic meters of extra liquefied natural gas volumes for the EU this year. They added this would be expected to increase in the future. President Joe Biden said the U.S. and EU would also "work together to take concrete measures to reduce dependence on natural gas." NeuConnect is not the only project focused on linking the U.K. with other parts of Europe. Last year, a 450-mile subsea cable which connects the U.K. and Norway, enabling them to share renewable energy, began commercial operations.

The idea behind the North Sea Link, as it's known, is for it to harness Norway's hydropower and the U.K.'s wind energy resources. Back in the U.K., 2020 saw plans announced for a multi-billion pound "underwater energy superhighway" that would allow electricity produced in Scotland to be sent to the northeast of England.

The Eastern Link project, which is currently in the early stages of development, is to focus on the development of a pair of high-voltage direct current cables that will have a total capacity of 4 GW.

CNBC

<http://www.cnbc.com>

WORLD POWER SYSTEMS REVIEW

15 April 2022

12 April 2022

Samsung Heavy, Seaborg join forces to develop floating nuclear power plants

South Korean shipbuilder Samsung Heavy Industries (SHI) and Seaborg Technologies, a Denmark-based startup focused on nuclear reactor technology, have entered into a partnership to develop floating nuclear power plants. The duo signed a partnership agreement at an online event last week.

As informed, the floating nuclear power plants will be based on Seaborg's Compact Molten Salt Reactor (CMSR). The agreement includes development of hydrogen production plants and ammonia plants, as the CMSR is said to be an ideal power source for the supply of stable, clean, and safe electricity. "CMSR is a carbon-free energy source that can efficiently respond to climate change issues and is a next-generation technology that meets the vision of Samsung Heavy Industries. In addition, when an abnormal signal occurs inside the reactor, the liquid nuclear fuel, molten salt, is solidified to prevent serious accidents at the source, and provides high safety and high efficiency power and hydrogen production at the same time," Jintaek Jeong, president of Samsung Heavy Industries, said. "Through this agreement, we plan to pioneer the CMSR-based floating nuclear power plant market as part of strengthening its future new business opportunity."

The aim of the strategic partnership is to manufacture and sell turn-key power plants, ready to be moored at industrial harbors and connected to the electric grid onshore. The stable production of energy also offers a fundamental basis for production of all Power-2-X fuels, where especially hydrogen and ammonia are considered a future energy source to replace traditional fossil fuels. The design of the hydrogen, ammonia and power units will be optimized for efficient serial construction at SHI's shipyards.

The floating nuclear power plant comes as a turn-key product, ready to be moored at an industrial harbor. In the harbor, a transmission cable will be connected to the electric grid onshore. An optional solution is to place a hydrogen or ammonia production plant next to the floating nuclear power plant utilizing the CO₂-free fission energy to produce hydrogen and ammonia. The floating nuclear power plant design is modular delivering up to 800 MW-electric for the 24-year lifetime and cost-competitive whether it plugs into the grid in an existing coal port or power production of hydrogen and ammonia, according to Seaborg. When an abnormal signal occurs inside the reactor, it is designed to solidify molten salt, a liquid nuclear fuel, to prevent serious accidents at the source, providing high safety and high-efficiency power and hydrogen production at the same time.

Offshore Energy

<http://www.offshore-energy.biz>

13 April 2022

Green Bitcoin mining proof of concept using Tesla solar and battery storage

Tesla's Megapack battery energy storage system (BESS) solution as well as the company's solar PV will power a Bitcoin mining facility in a proof of concept (POC) project in the US. Bitcoin mining and services company Blockstream Mining began construction earlier this month on the open-source, solar-powered facility at an undisclosed location.

The project is being built in partnership with financial services and digital payments company Block, Inc, which has Twitter co-founder Jack Dorsey as its CEO. Blockstream's CEO and co-founder Adam Back meanwhile said that the facility will be "a step to proving our thesis that Bitcoin mining can fund zero-emission power infrastructure and build economic growth for the future". The site will pair a 3.8MW solar PV array with 12MWh of Megapacks, enabling a 30 Petahash hash rate — a measure of the computational power

WORLD POWER SYSTEMS REVIEW

15 April 2022

used by the cryptocurrency mining's proof-of-work. A dashboard will be made publicly available as the plant runs, showing real-time metrics of performance, such as power output and the amount of mined Bitcoin. "By collaborating on this full-stack, 100% solar-powered Bitcoin mining project with Blockstream, using solar and storage technology from Tesla, we aim to further accelerate Bitcoin's synergy with renewables," Block's global ESG lead Neil Jorgensen said. The off-grid site aims to prove 100% renewable energy-powered Bitcoin mining is possible, hopefully providing an example to the industry.

Tesla CEO Elon Musk famously said in the past that his company would row back on its interest in Bitcoin due to the use of fossil fuels in mining, despite other attractive characteristics that crypto has. In May 2021 the company stopped accepting it as payment over those concerns.

Energy Storage News

<http://www.energy-storage.news>

14 April 2022

Shell and Uniper Plot 720MW Blue Hydrogen Plant on the Humber

Shell and Uniper have inked an agreement to develop a blue hydrogen production plant at the Killingholme Power Station that would provide low carbon fuel to power plants, industrial sites and transportation companies throughout the Humber region. The partners said they intend to produce up to 720MW of hydrogen at the proposed site, producing the low carbon fuel by steam reforming fossil gas and using carbon capture and storage (CCS) to prevent the majority of emissions generated during the process from polluting the atmosphere.

The Humber Hub Blue Project could see the capture of approximately 1.6 million metric tonnes of carbon per year through CCS, according to the energy giants, who claimed this could make a significant dent in the UK government's target to have 10Mt of annual CCS capacity built or operational by 2030. UK country chairman and chief commercial officer at Uniper Mike Lockett said the blue hydrogen plant could play a key role in the broader effort to decarbonise the emissions-intensive Humber region.

Under the plans, carbon captured at the plant would be transported in a pipeline that would shuttle emissions from industrial and power emitters across the region to the offshore Northern Endurance Partnership CO2 storage facility in the North Sea. Plans for the pipeline are currently being drawn up by the Zero Carbon Humber coalition of companies, which makes up one half of the East Coast Cluster scheme picked out last year by the government as one of two carbon capture and storage cluster projects for priority support.

The Humber Hub Blue project is one of a number of proposed projects within those two priority clusters chosen by the department for Business, Energy and Industrial Strategy (BEIS) last month as eligible for support as part of the second phase of its industrial decarbonisation support programme.

Shell and Uniper said they now plan to collaborate on process design studies and site development activity, with a view to taking the project to front end engineering and design stage by 2023. The government has said it expects all 'phase two' projects to secure support through its support programme to be operational from 2027, with final investment decisions given from 2024.

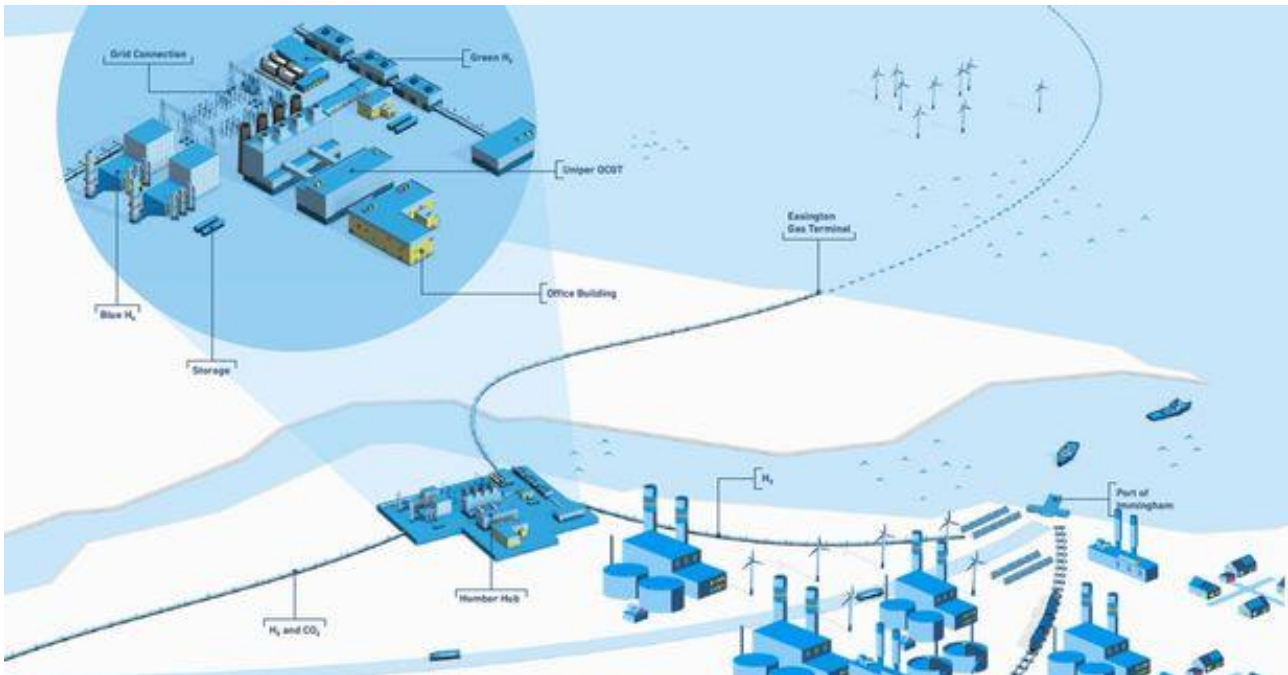
Minister for Business, Energy and Clean Growth Greg Hands said the tie-up between Shell and Uniper would help the UK government reach its new aim to deliver 10GW of low carbon hydrogen by 2030, as set out in last week's Energy Security Strategy.

"We've set ambitious targets for hydrogen production in our British Energy Security Strategy and are investing £360m in innovative energy technologies to get us there," he

WORLD POWER SYSTEMS REVIEW

15 April 2022

said. "Today's announcement shows real confidence in hydrogen - creating high-quality jobs to level up the Humberside region, based on this clean, cutting-edge new super fuel."



The Humber Hub Blue project is one of a clutch of blue hydrogen projects that have been announced by oil and gas giants in the UK over the last year. BP is planning to build a 1GW site Teesside, Equinor is collaborating with SSE on a 600MW project on the north bank of the Humber, and Ineos has touted plans to build a "world-scale" plant at its oil and gas refinery near Grangemouth, Scotland.

However, blue hydrogen remains contentious among many environmentalists, who have warned that scaling up hydrogen capacity dependent on fossil gas risks keeping the country reliant on fossil fuel infrastructure and exploration for years to come, at precisely the time when emissions need to be rapidly reduced to hit net zero targets. They have also pointed out blue hydrogen plants rely on still-nascent CCS technologies which are unable to capture all CO₂ from the process, and could also prove more expensive in the long run than the technologies needed to produce 'green' - or renewable - hydrogen.

But advocates of blue hydrogen argue it could prove more cost-effective in the short-term than green hydrogen produced using renewable power and electrolysis, while freeing up renewable power to help decarbonise the grid and mitigate some of the job losses and disruption that would otherwise result from the scaling back of the gas industry.

Uniper is simultaneously planning a separate green hydrogen project at its Killingholme site which would produce zero emissions H₂ using renewables to power the electrolysis process which splits water into its component elements. The energy firm plans to complete the feasibility study for the project imminently, it said this week.

World Energy
<http://www.world-energy.org>