WORLD POWER SYSTEMS REVIEW

15 February 2023

1 February 2023

GE connects all units at 1.2 GW Jinzhai pumped storage hydro power plant in China

In line with the planned schedule, all units of the Jinzhai pumped storage power plant have now been successfully connected to grid and completed 15 days of trial operation, by this moment, all units are under commercial operation. Under the contract signed in 2017, GE Hydro Solutions was selected by Anhui Jinzhai Pumped Storage Power Co., LTD, one of the divisions of State Grid Xin Yuan, to supply four new 300 MW pumped storage turbines, generator-motors as well as the balance of plant equipment for the Anhui Jinzhai pumped storage power plant located in the Jinzhai County, Anhui Province, China. The first two units were connected to the grid in October 2022.

The 1.2 GW Jinzhai hydro power plant project will play a key role in this journey to a stronger energy mix in the country. The project annual generating capacity represents about 1.4 times the annual household electricity consumption in Jinzhai. Acting as a sustainable giant energy storage system, the Jinzhai pumped storage station will save up to 120,000 tons of coal and reduce 240,000 tons of carbon dioxide emissions every year. Pascal Radue, President & CEO, GE Hydro Solutions, said: “Pumped Storage is the largest source of energy storage that exists today, which can help stabilize the grid with the integration of wind and solar power. The Jinzhai pumped storage project now fully operational will provide for a huge amount of clean energy to China and will help stabilize the grid to ultimately help integrate more renewable energies in a reliable way. And the beauty of hydropower projects is that it is set to be operational for the very long term, about 80 years, meaning that the project will provide affordable energy for several generations to come.”

China aims to build more than 200 pumped storage stations with a combined capacity of 270 gigawatts by 2025 (Source: Bloomberg), to help solve grid stability challenge and integrate more renewable energy into the Chinese grid. Pumped storage units help stabilize the grid by acting act as giant batteries: water is pumped from the lower to the upper reservoir in times of surplus energy and, in times of demand, water from the upper reservoir is released, generating electricity as the water passes through the turbine.

This project adds up to the +12 GW of pumped storage solutions GE has delivered in China, which represent more than 25% of the installed base in the country. In the world, more than 30% of hydro storage plants are equipped with GE technology.

GE
http://www.ge.com/

1 February 2023

Terna: authorization procedure launched for the Adriatic Link, a new submarine cable between Italian regions of Abruzzo and Marche

The Ministry of Environment and Energy Security has launched the authorisation procedure for creation of the Adriatic Link, a new direct-current submarine power line connecting the Italian regions of Abruzzo and Marche. The project will see Terna invest over one billion euro and will directly or indirectly involve roughly 120 companies.

Planned work will enable an increase in exchange capacity of approximately 1000 MW between the Centre-South and Centre-North zones of the country, boosting the security, efficiency and resilience of the entire national transmission grid

The Adriatic Link, a project included in Terna’s 2018 Development Plan, is highly advanced in both technological and environmental terms. The “invisible” power line, running for a total of approximately 250 km, will be made up of two submarine cables with a length of approximately 210 km and two underground cables of approximately 40 km. The two electrical conversion stations will be created near the existing substations of Cepagatti

(province of Pescara), for Abruzzo, and Fano (province of Pesaro-Urbino) for the Marche region, and will have a minimal impact on local areas.

Cable laying on the seabed will reach a maximum depth of 100 metres. At the landing sites, horizontal directional drilling (HDD) will be used, enabling installation of conduits with limited environmental and social impacts on the coastline and guaranteeing protection of the electrical connection from possible coastal erosion. Similarly, for the overland stretch, the route primarily follows existing roadways. In the context of the marine survey, which certified the suitability of the seabed to host the line, approximately 700 km² of the Adriatic Sea were inspected. This activity was carried out in two phases: during the first, geological, sedimentological, seismic, coastal-erosion, flora, fauna and ecosystem factors were assessed for authorisation purposes. During the second, bathymetric, morphological and geophysical surveys were performed in preparation for authorisation of the definitive plans.

Recognising its strategic importance, the Regulatory Authority for Energy, Networks and the Environment (ARERA) has, in fact, requested that operations begin two years earlier than the initial forecasts. The Adriatic Link will have a front-line role in development and integration of renewables, contributing to decarbonisation of the Italian energy system and, in line with the goals set out in the National Integrated Energy and Climate Plan (PNIEC), will further strengthen Terna's role as director and enabler of the ecological transition, as well as Italy's role as an electricity hub for Europe and the whole Mediterranean region.

The project is the result of a long process of consultation and dialogue with local areas. Since December 2020, more than 100 meetings have been held, also involving public consultation, with regional and municipal authorities, associations and citizens, giving the opportunity to present proposals, analyses and initiatives connected to the planned work.

Terna
http://www.terna.it/

1 February 2023

Russian Renewable Energy Market: Current Status and Development Prospects

The Russia Renewable Energy Development Association (RREDA) has released a new annual review of the renewable energy industry "Russian Renewable Energy Market: current status and development prospects". It covers the period from 2021 to the first half of 2022. The review is especially relevant in the context of the changing of a geopolitical situation in the world. The main topics of this issue:

- The prospects of the renewable energy industry in Russia and worldwide in terms of the current geopolitical situation and sanctions restrictions;
- The implemented and potential investment projects in the renewable energy sector in Russia in the wholesale and retail markets;
- The competitive selections of RES projects in 2021, its results, and analyzing the program of support for the renewable energy industry in Russia until 2035;
- Hydrogen energy
- The most important decisions and legislative changes in the field of climate policy and carbon regulation.

RREDA
http://rreda.ru/

1 February 2023

JFK Terminal deploys solar microgrid to mitigate potential grid outages

A solar microgrid under development at the New Terminal One at John F. Kennedy International Airport in New York City aims to bring clean energy and resilience to one of the country's busiest airports. With more than 13,000 solar panels and 7.6 MW of generating

capacity, the rooftop PV system would become the largest on any airport terminal in the US. The microgrid also is designed to feature 3.6 MW of fuel cells and 2 MW/4 MWh of battery energy storage. The microgrid is planned to consist of four "power islands," with each island functioning as a local, integrated energy system with sources of generation, storage, advanced automation, and control.

NTO – a consortium of labor, operating, and financial partners including Ferrovial, Carlyle, JLC Infrastructure, and Ullico – is building the privately financed all-international terminal at John F. Kennedy International Airport, in partnership with the Port Authority of New York and New Jersey.

Power Grid
http://www.power-grid.com/

1 February 2023

Maine regulators allow wind, utility project to move forward

Maine utility regulators on Tuesday gave final approval to a wind power project that would provide enough electricity for at least 450,000 New England homes along with construction of a new transmission corridor in northern Maine to get the electricity to the regional power grid.

The unanimous vote by the Maine Public Utilities Commission on two projects bearing a net cost of $1.8 billion comes after Massachusetts endorsed the proposal, becoming a partner on the 1,000-megawatt project and allowing the costs to be shared by a larger pool of ratepayers. Under the plan, Maine ratepayers would be responsible for 60%, or about $1 billion of the costs, officials said. The average ratepayer would pay an extra $1 per month over the first decade, officials said. "Developing renewable resources in northern Maine is a tremendous opportunity, and one that is critical to achieving decarbonization goals in Maine and New England. With support from both Maine and Massachusetts, I'm confident the selected projects are viable and give us the best chance to achieve a successful outcome," PUC Chair Phillip Bartlett said.

But commissioners still had reservations over the cost. They encouraged the participation of additional parties to further reduce costs for Maine ratepayers. Although Commissioner Patrick Scully supported the project, he suggested general revenue or bonds should be used to fund such projects to ease the impact on ratepayers. The northern Maine project is separate to a $1 billion proposal fully funded by Massachusetts ratepayers that calls for a proposed 145-mile (230-kilometer) transmission line in western Maine that would be a conduit for 1,200 megawatts of Canadian hydropower to reach the New England power grid.

Maine voters rebuked that project, called the New England Clean Energy Connect, and it remains mired in a legal battle. For the new proposal, state lawmakers directed Maine utility regulators to choose the projects to boost transmission capacity and renewable energy in Aroostook County. Last fall, the PUC chose LS Power Base for a 345-kilovolt transmission project and Longroad Energy's King Pine for a wind generation project. It calls for about 179 wind turbines west of Houlton. Together, the projects would benefit the state by lowering electricity rates, reducing dependence on fossil fuels and lowering carbon emissions, officials said. The project also allows far northern Maine to be connected to the New England regional grid for the first time. "Maine is in the midst of an energy crisis and the key to meaningful energy relief is in our own backyard," said Senate President Troy Jackson, who's from the northern Maine community of Allagash.

Dan Burgess, who leads the Governor's Energy Office, said the projects would "reduce our dependence on volatile fossil fuels and deliver significant new job and economic opportunities to communities in northern Maine." The project could produce 1,000

megawatts of power when the turbines are operating at peak efficiency — enough power for as many as 900,000 homes. Longroad Energy projects that the electricity will be adequate for 450,000 homes on average annual basis. The Natural Resources Council of Maine vehemently opposed the New England Clean Energy Connect but praised the northern Maine project because it supports home-grown wind power. “Infusing our electric grid with wind energy sourced from Aroostook County is an economic boost to local communities, a win for New England electricity consumers, and a promising example of regional collaboration on our energy future,” said Jack Shapiro, NRCM’s climate and clean energy director.

Renewable Energy World
http://www.renewableenergyworld.com/

2 February 2023

Renewables account for 92% of Brazil's power production in 2022

The Brazilian Power Trading Chamber (CCEE) announced on Wednesday that 92% of the country's 2022 electricity production came from renewable energy sources, the highest level in the past decade. Renewable energy plants have produced close to 62,000 MWa in 2022, according to a study carried out by CCEE. This is the result of more favourable hydro conditions and the expansion of wind and solar power capacity, it said.

With 1,400 average megawatts (MWa) produced, solar was the top producer with a 64.3% jump when compared to 2021 generation. In all, the country connected 88 new solar parks to the national grid in 2022. Hydropower plants (HPPs) came in second with a 17.1% increase, while wind and biomass power went up by 12.6% and 0.3%, respectively. More details are available in the table below.

Source	2022 output	Y/Y increase
Solar	1,400 MWa	64.3%
Hydro	48,000 MWa	17.1%
Wind	9,000 MWa	12.6%
Biomass	3,000 MWa	0.3%

Renewables Now
http://renewablesnow.com/

2 February 2023

Mochovce 3 supplies first electricity to grid

Branislav Strýček, Chairman and CEO of Slovak Power Plants, said: "Today represents a fundamental milestone for Slovenské elektrárne, the community of nuclear energy workers and the entire country. As of today, the third unit converts the thermal energy released in the reactor into electricity. This will help us fulfill the agreement with the government, in which Slovenské elektrárne undertook to supply cheap electricity for households at a price of EUR61.2077 euros (USD66.7) per megawatt hour, which represents an unprecedentedly low price of electricity for households within the EU. During the energy start-up process so far tests have been carried out at increasing power levels -

5%, 15% and 20% - of the reactor's nominal power. The company said: "After successfully preparing and carrying out the tests necessary for the start of the turbines, over the weekend, steam was brought into them for the first time, which gradually spun them up to the nominal speed - 3000 revolutions per minute." Tests were also completed on the generator itself, the block transformer and the 400kV line connecting the plant to the electricity system. "After completing this part of the power start-up, Slovenské elektrárne could proceed to the actual phasing of the first turbogenerator to the network at 20% of the nominal power of the reactor and the third unit ... began supplying the first electricity to the network."

The next stage of the launch process will be to test the block at levels from 35% to 100%, with the final step due to be the successful completion of a 144-hour trial run at full 471MWe output. Martin Mráz, director of Mochovce plant, said that in the coming weeks "the new unit will supply electricity to the grid with short-term planned shutdowns, according to the new unit commissioning schedule".

Construction of the first two 471 MWe VVER units at the four-unit Mochovce plant started in 1982. Work began on units 3 and 4 in 1986, but stalled in 1992. The first two reactors were completed and came into operation in 1998 and 1999, respectively, with a project to complete units 3 and 4 beginning ten years later. Unit 4's schedule has been to follow about one or two years behind unit 3. Each of the units will be able to provide 13% of Slovakia's electricity needs when operating at full capacity. The final design includes many upgrades to safety and security, including increased aircraft impact protection and emergency management measures based on lessons from the Fukushima accident which were incorporated during the project. The Slovak Nuclear Regulatory Authority issued the final authorization for commissioning of unit 3 of the Mochovce nuclear power plant in August. The service life of the new block is initially planned to be 60 years.

World Nuclear News
http://www.world-nuclear-news.org/

2 February 2023

Kobelco Power Kobe No. 2 fires up Unit 4 at Kobe power plant in Japan

Kobe Steel, through its wholly owned subsidiary Kobelco Power Kobe No. 2, has started the operation of Unit 4 at the Kobe Power Plant in Kobe, Japan to supply power to Kansai Electric Power. Kobelco Power Kobe No. 2 has completed all the necessary legal procedures and confirmed that Unit 4 meets the prescribed conditions, before the start of commercial operation.

The 650MW new power generation unit, together with Unit 3 at Kobe Power Plant, which started commercial operation in February last year, brings the combined capacity to 1.3GW. As part of the national energy policy, Japan has been promoting the transition to higher-efficiency thermal power plants. The policy aims to deliver a stable energy supply, economic efficiency, and environmental compliance with safety as a priority. Unit 3 and Unit 4 of Kobe Power Plant are located close to Kobe City and the surrounding Hanshin area has high electricity demand. The installation of an ultra-supercritical pressure power generation system is expected to contribute to the improvement of power supply efficiency. In addition, the advanced power generation technology will contribute to the development of the region through the stable supply of economically efficient electricity.

Kobelco Power said: “Kobelco Power Kobe No. 2 will fulfil its role as an urban power plant operator with due consideration for the local community, as required by the Environmental Conservation Agreement concluded with Kobe City pursuant to the Kobe City’s ordinance to protect the environment of Kobe citizens. “In the commissioning before the start of commercial operation, it was confirmed that the No. 4 unit satisfies the

requirements as provided in the agreement." In a separate development, Kobe Steel and Japanese power generator JERA have jointly started commercial operations at a natural gas-fired unit at Anegasaki thermal power station near Tokyo.

The new unit at Anegasaki thermal power station (Unit 1) is a combined cycle gas turbine (CCGT), with a 650MW generating capacity. JERA is building two additional new gas-powered units at the Anegasaki power station, which are expected to come online in April and August this year.

NS Energy
http://www.nsenergybusiness.com/

3 February 2023

Model aims to optimize black start grid restoration

A team of researchers at Sandia National Laboratories created a computer model aimed at helping grid operators quickly restore power to the electric grid after a blackout. According to the Sandia scientists, the model combines a restoration-optimisation model with a computer model of how grid operators would make decisions when they don't have complete knowledge of every generator and distribution line. Researchers say the model can help provide insight into how individual power generators, distribution substations and power lines would react during the process of restoring power.

The model also can simulate black starts that are triggered by disruptions such as a successful cyberattack. In terms of optimising restoring power, the model assesses the grid and its components to determine how to restore power as quickly as possible, said Bryan Arguello, a Sandia computer scientist. Arguello said an example of an optimal approach might be to start with generator 1 to power up substation A. Once substation A is energized, generators 2-4 can safely power up. These, in turn, will provide power to substations B, C and D, as well as some critical infrastructure such as a water purification plant or an area hospital. Once substation D is energized, power plants 5-8 can power up, and so on until power is restored to the entire grid.

Once the power-restoration schedule is developed, the algorithm compares it against physical limitations to determine if the schedule is feasible, Arguello said. This process is based off a similar model created by researchers at Lawrence Livermore National Laboratory and the University of California Berkeley. "The challenge here is bringing in just the right amount of information so that the model can make wise decisions, without bogging it down in too much detail," said Arguello.

The model can also accurately approximate alternating current power flow, according to the researchers, which they say is more complex than direct current. The model also offers a more accurate representation of the grid during severe disruptions such as black start conditions. The operator decision-making code plays an essential role in the overall model, researchers said. This algorithm takes the results from the optimisation code and enacts it on a third code, which they described as a "physics-based simulation of the grid and how it dynamically responds to the operator's actions."

The decision-making model is based on a model created by scientists at Carnegie Mellon University, but adapted for power restoration by coding in expert knowledge about the steps required to start a generator and then connect it to the nearest substation. This also includes safeguards so the cognitive model wouldn't freeze if the grid behaved unexpectedly, Sandia scientists said. The operator model interacts with the grid model through a simulated console and is limited to the knowledge presented by the console, rather than presuming the grid operator knows everything, which is typically assumed in power-restoration models.

Researchers said the operator model can assess whether the network model's behavior matches up with what it is expecting based on the results of the optimisation algorithm. The simulated console can also allow the team to swap in actual feeds of information from the grid for the network dynamic model, if a partner provides the information, they added.

"Black starts are really rare, extreme events, but when one happens it's really bad," said Systems Analyst Casey Doyle. "Even in partial blackouts, like what happened in Texas in 2021, people died because they didn't have power, they didn't have heat. If you have a complete blackout, it's likely that it would be caused by a hurricane or earthquake and operators are trying to restore power to whole communities. Delays in power restoration could cause even more damage or loss of life. It's hugely impactful to understand how to bring the power back as quickly as possible." The three-year project was funded by Sandia's Laboratory Directed Research and Development programme. The researchers are currently looking for sponsors to continue and expand the project.

Power-Grid International
http://www.power-grid.com/

3 February 2023

Copenhagen Infrastructure Partners and Amberside Energy announce a partnership to deliver solar and battery storage projects in the UK

Under the terms of the partnership, CIP's Flagship Funds will provide the capital for project development with the ambition of creating a portfolio of scale that, over time, will have projects in operation, in construction as well as under development. Subject to investment decisions at the time, CIP intends to provide the capital required for the construction of the projects in this portfolio. The projects are aligned with the UK's net zero targets and will make a significant contribution towards increasing energy independence in the UK, providing predictable and affordable power at a competitive cost and decarbonizing energy production.

"We look forward to a successful partnership with Amberside Energy for the development of a significant pipeline of clean-energy projects that will help accelerate the UK's energy transition to 'net zero' greenhouse gas emissions by 2050. UK solar and battery storage have become increasingly competitive in recent years and are now some of the most cost-efficient technologies, contributing to enhancing grid flexibility, resilience and increasing the overall security of supply. We look forward to working closely with AE's highly experienced team to deliver projects that in addition to clean power at competitive prices also generate investment, jobs, and socioeconomic benefits," says Radu Gruescu, Partner at CIP.

Local community engagement and maintaining industry-leading ESG standards will be core to the partnership's objectives, with the projects also expected to deliver local and regional socio-economic benefits. Amberside Energy will continue to lead origination and development activities for the solar and battery storage projects while CIP will contribute its expertise in procurement, structuring and financing renewable energy projects.

GlobeNewswire
http://www.globenewswire.com/

5 February 2023

Japan looks beyond territorial waters for wind power amid green push

Japan is planning to expand offshore wind power generation beyond its territorial waters and into its exclusive economic zone (EEZ) in a push to achieve carbon neutrality and ensure energy security. A panel of experts who looked into the feasibility of building

wind power facilities in the EEZ has recently concluded that such construction is possible as long as Japan backs it with domestic law. Based on that view, the government is planning to prepare necessary legislation or a legal revision, officials said, just as the country is set to update its marine strategy around May.

Resource-scarce Japan has relied heavily on thermal power but the rising global momentum toward decarbonization means it needs to secure more energy from alternative sources like renewables, which account for only a small portion of the nation's energy mix. Some European nations, including Britain, Belgium and the Netherlands, already have offshore wind farms in their EEZs. China and South Korea are also stepping up offshore wind power generation.

Wind electricity generation achieved the highest growth among renewable sources in 2021 but annual output capacity needs to increase to achieve carbon neutrality in 2050, according to the International Energy Agency, which noted that further cost reductions are required for offshore wind power. The ruling Liberal Democratic Party has been urging the government to come up with a strategy to make better use of the sea, which is critical for transport, resource development and national security.

Japan's biggest business lobby, Keidanren, has also stressed the need for the island nation, which has the world's sixth largest marine area, to boost its maritime competitiveness. The Japan Business Federation, as the body is formally known, singled out offshore wind power as a key area that requires support to build necessary supply chains and develop technology that will help curb costs. Japan already has offshore wind turbines fixed to the seabed within its territorial waters. In the EEZ extending up to 200 nautical miles, or around 370 kilometers, from the coastal baseline, where water is deeper, floating wind turbines are will be necessary.

The recent go-ahead by the government panel is a step forward in Japan's future installation of offshore wind turbines in the EEZ but experts say it will likely take years for them to become operational. By 2040, Japan is aiming to boost offshore wind power generation to 30 to 45 gigawatts, equivalent to roughly 45 nuclear reactors.

In the broader energy mix, the government aims for renewables to account for 36% to 38% in fiscal 2030, doubling from fiscal 2019. Japan will get around 20% each from nuclear power and coal. The offshore wind power push could become a sensitive issue when national security comes into the equation. The government will need to decide where in the EEZ to allow such equipment to be installed and consult with relevant parties.

Under the United Nations Convention on the Law of the Sea, the coastal state has "sovereign rights" when "exploring, exploiting, conserving and managing the natural resources" in the EEZ. The state can set safety zones around installations and structures like wind turbines but freedom of navigation should be ensured for all states. The law also calls for "due regard" to the rights of other states. "When it comes to 'due regard,' it's important to ensure the freedom of navigation for other states. Before that, what is more important is to decide what Japan intends to do," the report by the government panel said.

The Japan Times
http://www.japantimes.co.jp/

6 February 2023

One of Southeast Asia's largest energy storage systems comes online

Sembcorp Industries (Sembcorp) and Singapore's Energy Market Authority (EMA) have officially opened what is being touted as Southeast Asia's largest energy storage system. The Sembcorp energy storage system (ESS) spans two hectares of land in the Banyan and Sakra region on Jurong Island, southwest of the main island of Singapore. Commissioned in only six months, the utility-scale ESS has a maximum storage capacity of

285MWh that can meet the electricity needs of around approximately 24,000 households for one day in a single discharge. Its rapid response time helps mitigate the intermittency caused by increasing amounts of solar power in Singapore. It can also provide reserves to the power grid, which frees up power generation plants to generate more electricity to meet demand when needed. The Sembcorp ESS is an integrated system comprising more than 800 large-scale lithium iron phosphate battery units.

It uses a Supervisory Control and Data Acquisition (SCADA) platform by Envision which offers monitoring and control of the ESS from the site level down to each battery unit and auxiliary equipment. Live monitoring through the use of intelligent sensors, security cameras and dashboards tracks operational performance. A decentralised temperature control system by Huawei was deployed to maintain the batteries' temperature difference within a narrow range. This increases the battery lifespan and ensures a stable power output, according to Sembcorp.

China Energy Engineering Group Shanxi Electric Power Engineering Co., Ltd. (SEPEC) oversaw the engineering, procurement, construction, infrastructure works, installation and commissioning of the Sembcorp ESS. The Energy Market Authority (EMA), a statutory board under the Singapore Ministry of Trade and Industry, is taking proactive steps to encourage the deployment of energy storage systems across the island. Various statutory papers have been published to provide clarity on the deployment of ESS in Singapore and the current regulatory framework.

The EMA and SP PowerAssets (SPPA) are also collaborating on a regulatory sandbox to test SPPA's ability to use ESS to smooth out electricity supply during times of high electricity usage in residential areas.

Smart Energy
http://www.smart-energy.com/

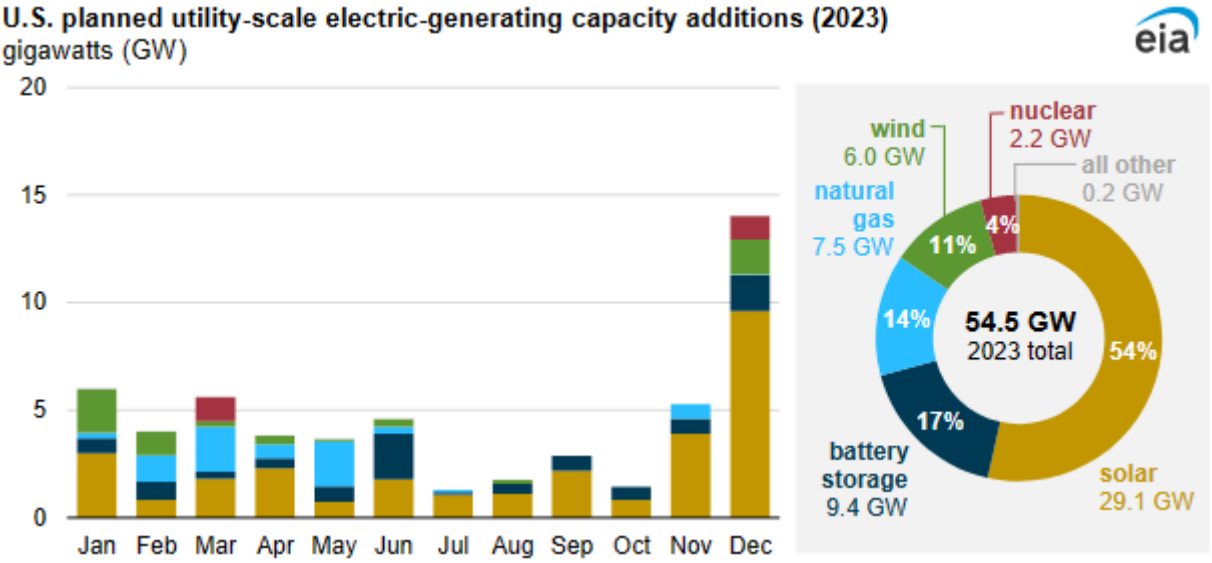
6 February 2023

EIA: More than half of new U.S. electric-generating capacity in 2023 will be solar

Developers plan to add 54.5 gigawatts (GW) of new utility-scale electric-generating capacity to the U.S. power grid in 2023, according to our Preliminary Monthly Electric Generator Inventory. More than half of this capacity will be solar power (54%), followed by battery storage (17%).

Solar. U.S. utility-scale solar capacity has been rising rapidly since 2010. Despite its upward trend over the past decade, additions of utility-scale solar capacity declined by 23% in 2022 compared with 2021. This drop in solar capacity additions was the result of supply chain disruptions and other pandemic-related challenges. We expect that some of those delayed 2022 projects will begin operating in 2023, when developers plan to install 29.1 GW of solar power in the United States. If all of this capacity comes online as planned, 2023 will have the most new utility-scale solar capacity added in a single year, more than doubling the current record (13.4 GW in 2021). In 2023, the most new solar capacity, by far, will be in Texas (7.7 GW) and California (4.2 GW), together accounting for 41% of planned new solar capacity.

Battery storage. U.S. battery storage capacity has grown rapidly over the past couple of years. In 2023, U.S. battery capacity will likely more than double. Developers have reported plans to add 9.4 GW of battery storage to the existing 8.8 GW of battery storage capacity. Battery storage systems are increasingly installed with wind and solar power projects. Wind and solar are intermittent sources of generation; they only produce electricity when the wind is blowing or the sun is shining. Batteries can store excess electricity from wind and solar generators for later use. In 2023, we expect 71% of the new battery storage capacity will be in California and Texas, states with significant solar and wind capacity.



Natural gas. Developers plan to build 7.5 GW of new natural-gas fired capacity in 2023, 83% of which is from combined-cycle plants. The two largest natural gas plants expected to come online in 2023 are the 1,836MW Guernsey Power Station in Ohio and the 1,214 MW CPV Three Rivers Energy Center in Illinois.

Wind. In 2023, developers plan to add 6.0 GW of utility-scale wind capacity. Annual U.S. wind capacity additions have begun to slow, following record additions of more than 14 GW in both 2020 and 2021. The most wind capacity will be added in Texas in 2023, at 2.0 GW. The only offshore wind capacity expected to come online this year is a 130.0 MW offshore windfarm in New York called South Fork Wind.

Nuclear. Two new nuclear reactors at the Vogtle nuclear power plant in Georgia are scheduled to come online in 2023, several years later than originally planned. The reactors, with a combined 2.2 GW of capacity, are the first new nuclear units built in the United States in more than 30 years.

EIA
http://www.eia.gov/

8 February 2023

IEA: Electricity Market Report 2023

This year's report offers a deep analysis of recent policies, trends and market developments, including forecasts through 2025 for electricity demand, supply and CO2 emissions – with a detailed study of the evolving generation mix. It contains a comprehensive analysis of developments in Europe, which faced a variety of energy crises in 2022. The Asia Pacific region also receives special focus, with its fast-growing electricity demand and accelerating clean energy deployment.

Renewables are set to dominate the growth of the world's electricity supply over the next three years as together with nuclear power they meet the vast majority of the increase in global demand through to 2025, making significant rises in the power sector's carbon emissions unlikely, according to a new IEA report. After slowing slightly last year to 2% amid the turmoil of the global energy crisis and exceptional weather conditions in some regions, the growth in world electricity demand is expected to accelerate to an average of 3% over the next three years, the IEA's Electricity Market Report 2023 finds. Emerging and developing economies in Asia are the driving forces behind this faster pace, which is a step up from average growth of 2.4% during the years before the pandemic.

More than 70% of the increase in global electricity demand over the next three years is expected to come from China, India and Southeast Asia, although considerable

uncertainties remain over trends in China as its economy emerges from strict Covid restrictions. China's share of global electricity consumption is currently forecast to rise to a new record of one-third by 2025, up from one-quarter in 2015. At the same time, advanced economies are seeking to expand electricity use to displace fossil fuels in sectors such as transport, heating and industry.

"The world's growing demand for electricity is set to accelerate, adding more than double Japan's current electricity consumption over the next three years," said IEA Executive Director Fatih Birol. "The good news is that renewables and nuclear power are growing quickly enough to meet almost all this additional appetite, suggesting we are close to a tipping point for power sector emissions. Governments now need to enable low-emissions sources to grow even faster and drive down emissions so that the world can ensure secure electricity supplies while reaching climate goals."

While natural gas-fired power generation in the European Union is forecast to fall in the coming years, based on current trends, significant growth in the Middle East is set to partly offset this decrease. Sharp spikes in natural gas prices amid the energy crisis have in turn fuelled soaring electricity prices in some markets, particularly in Europe, prompting debate in policy circles over reforms to power market design.

Meanwhile, expected declines in coal-fired generation in Europe and the Americas are likely to be matched by a rise in the Asia-Pacific region, despite increases in nuclear power deployment and restarts of plants in some countries such as Japan. This means that after reaching an all-time high in 2022, carbon dioxide (CO2) emissions from global power generation are set to remain around the same level through 2025.

The strong growth of renewables means their share of the global power generation mix is forecast to rise from 29% in 2022 to 35% in 2025, with the shares of coal- and gas-fired generation falling. As a result, the CO2 intensity of global power generation will continue to decrease in the coming years. Europe bucked this global trend last year, however. The CO2 intensity of Europe's power generation increased as a result of higher use of coal and gas amid steep drops in output from both hydropower, due to drought, and nuclear power, due to plant closures and maintenance. This setback will be temporary, though, as Europe's power generation emissions are expected to decrease on average by about 10% a year through 2025.

Electricity demand trends varied widely by region in 2022. India's electricity consumption rose strongly, while China's growth was more subdued due to its zero-Covid policy weighing heavily on economic activity. The United States recorded a robust increase in demand, driven by economic activity and higher residential use amid hotter summer weather and a colder-than-normal winter.

Demand in the European Union contracted due to unusually mild winter weather and a decline in electricity consumption in the industrial sector, which significantly scaled back production because of high energy prices and supply disruptions caused by Russia's invasion of Ukraine. The 3.5% decrease in EU demand was its second largest percentage decline since the global financial crisis in 2009, with the largest being the exceptional contraction due to the Covid shock in 2020

The new IEA report notes that electricity demand and supply worldwide are becoming increasingly weather dependent, with extreme conditions a recurring theme in 2022. In addition to the drought in Europe, there were heatwaves in India, resulting in the country's highest ever peak in power demand. Similarly, central and eastern regions of China were hit by heatwaves and drought, which caused demand for air conditioning to surge amid reduced hydropower generation in Sichuan province. The United States also saw severe winter storms in December, triggering massive power outages.

These highlight the need for faster decarbonisation and accelerated deployment of clean energy technologies, the report says. At the same time, as the clean energy transition gathers pace, the impact of weather events on electricity demand will intensify due to the increased electrification of heating, while the share of weather-dependent renewables will continue to grow in the generation mix. In such a world, increasing the flexibility of power systems while ensuring security of supply and resilience of networks will be crucial.

IEA
http://www.iea.org/

8 February 2023

Norway resumes license processing for a 1.4 GW interconnector with the UK

The Norwegian Ministry of Petroleum and Energy has announced that it will resume the application license processing for the development of the 1.4 GW. NorthConnect interconnection project between Norway and the United Kingdom, after the processing was put on hold in 2020. The NorthConnect link is a subsea, 650 km, high-voltage direct current (HVDC) power interconnection project that would link Peterhead in Scotland (UK) to Simadalen in southern Norway. The project is developed by NorthConnect Limited, a joint venture between the Scandinavian companies Lyse, Agder Energi, Hafslund E-Co and Vattenfall.

In March 2020, the Norwegian Ministry of Petroleum and Energy had informed NorthConnect that there was no sufficient basis for deciding in the case of the NorthConnect link and the license processing was put on hold. With the restart of the project, the ministry has sent a letter to NorthConnect and requested that any new information or other input that may be relevant for processing the case be sent by the end of February 2023.

EE Online
http://electricenergyonline.com/

9 February 2023

South Africa invokes disaster law to tackle energy crisis

South African President Cyril Ramaphosa on Thursday declared a national "state of disaster" over his country's crippling power shortages, saying they posed an existential threat to the economy and social fabric. The electricity crunch has been years in the making, a product of delays in building new coal-fired power stations, corruption in coal-supply contracts, criminal sabotage and failures to ease up regulation to enable private providers to swiftly bring renewable energy on tap.

"The crisis has progressively evolved to affect every part of society. We must act to lessen the impact of the crisis on farmers, on small businesses, on our water infrastructure and our transport network." State electricity utility Eskom is implementing the worst rolling blackouts on record, leaving households in the dark, disrupting manufacturing and hurting businesses of all sizes. The power cuts are expected to reduce economic growth in Africa's most industrialized nation to just 0.3% this year. Declaring a national state of disaster gives the government additional powers to respond to a crisis, including by permitting emergency procurement procedures with fewer bureaucratic delays and less oversight. The legislation was used to enable health authorities to respond more swiftly to the COVID-19 pandemic, but some analysts doubt it will help the government expand power supply much quicker.

Eskom said it would study the details of the declaration before commenting. Brighton Hlupego, a street trader outside Cape Town City Hall where Ramaphosa delivered his speech, said the biggest problems facing South Africans were poverty, unemployment and electricity. The biggest opposition party, the Democratic Alliance, said it would challenge the "state of disaster" declaration in court, alleging Ramaphosa's party issued nonsensical

regulations and abused procurement processes during the pandemic. Ramaphosa also said on Thursday that the government was working on a mechanism for targeted basic income support for the most vulnerable, within fiscal constraints. He started his speech about 45 minutes late after opposition lawmakers, mainly from the far-left Economic Freedom Fighters party, disrupted proceedings and tried to barge onto the stage.

Reuters
http://www.reuters.com/

10 February 2023

Envision unveils giant 10MW onshore turbine

Envision Energy has unveiled a new EN-220/10MW onshore wind turbine. The unit is designed for China's northern Sanbei regions, according to Chinese state media. The new 10MW machines have a unit capacity and rotor diameter that rank top in the world, added local reports. The turbines will increase power generation by eight percent compared to the company's previous EN-171/6.7MW model.

The Sanbei regions will be at the forefront of China's new energy drive, state media continued, with authorities planning a speed up of construction of solar and wind power generation facilities in arid regions such as the Gobi Desert in a bid to boost renewable energy.

Renew.biz
http://renews.biz/

14 February 2023

Major power outage hits Cuba

Cuba's Ministry of Energy and Mines confirmed on social media Monday that the power outage that left half the island without electricity was due to "a fire in a sugar cane plantation," it was reported. A "failure" in high voltage lines left the center and eastern parts of the island without electricity. According to state-owned Unión Eléctrica (UNE), 7 of Cuba's 15 provinces have been without power since past noon: from central Ciego de Avila to eastern Camagüey, Las Tunas, Granma, Holguín, Santiago de Cuba, and Guantánamo.

Energy and Mines Minister Vicente de la O Levy also explained that work was being done to "reestablish the system" and said it would "take between 4 and 5 hours". It was one of the largest power outages since Sept. 27, when no electricity was generated after Hurricane Ian hit the island's western part, leaving the entire country in a blackout. Since then, blackouts have decreased noticeably, especially since the second half of December, and have remained at lower levels in the first weeks of 2023, with blackouts below 10% during peak demand hours, EFE reported.

Last year, blackouts were daily and lasted for up to 12 hours a day in some regions with almost 40% of the country affected at times, mainly due to aging terrestrial thermoelectric plants over 40 years old with little to no maintenance, in addition to a lack of fuel, which was all worsened by the country's economic crisis amid tightening US economic sanctions and the Covid-19 pandemic.

Blackouts scare away tourists and also generate social discontent. In this scenario, an explosion caused by "a gas leak" in a central Havana hotel left one person injured on Monday, just 10 months after 47 people died in another hotel blast in Havana. "The cause of the incident was a gas leak," authorities reported about Monday's incident at the Caribbean hotel on Paseo del Prado, a major avenue in the Cuban capital.

Merco Press
http://mercopress.com/