

WORLD POWER SYSTEMS REVIEW

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15 April 2022

Japan's Greenhouse Gas Emissions Fall to Lowest on Record

Japan's greenhouse gas emissions fell to a record low in the financial year that ended March 2021, government figures showed on Friday, a result of slower industry activities amid the pandemic and wider use of renewable energy.

The 5.1 percent decline marks seven consecutive years of falls. Emissions for 2020-21 fell to the equivalent of 1.15 billion tonnes of carbon dioxide (CO₂) from 1.21 billion tonnes the previous year. The 2020-21 level was the lowest since 1990-91 when Japan began compiling data on greenhouse gas emissions, revised data from the environment ministry shows. Japan, the world's fifth-biggest carbon emitter, raised its climate goal in April 2021, pledging to trim emissions by 46 percent from 2013 levels by 2030 instead of its previous target of 26 percent. If this is achieved, 2030 emissions will be 0.76 billion tonnes.

The 2020-21 figure represents a reduction of 18.4 percent from 2013 levels. "Although emissions have decreased for seven straight years, we are still a long way from achieving carbon neutrality and can't be optimistic," Masayuki Koiwa, a director at the ministry, told reporters. "To achieve the 2030 target and our 2050 goal of carbon neutrality, we need to maximize the use of renewable energy," he said. The ministry would promote solar power in particular to meet the 2030 target because that method of generation could be applied quickly.

Japan's emissions surged after the 2011 nuclear disaster at Fukushima led to the closure of nuclear power plants and boosted reliance on fossil fuels, but have turned lower since a peak of 1.41 billion tonnes hit in the 2013-14 year. Ten reactors have been restarted, the most since the Fukushima incident, though only five are currently operating. Renewable energy accounted for 19.8 percent of electric power generation of one trillion kilowatt-hours in 2020-21, up 1.6 percentage points from the previous year. Nuclear energy fell 2.3 percentage points to 3.9 percent, while thermal power made up 76.3 percent, up 0.7 percentage points, industry ministry data showed.

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

18 April 2022

Capacity prices jump across MISO's central and northern regions, driven by supply shortfall

When MISO and the Organization of MISO States, a group representing state utility commissions, released their annual resource adequacy survey in June it appeared there was enough capacity across the grid operator's footprint to meet its needs for the capacity year that starts June 1, 2022.

However, the expected 3.4-GW to 13.9-GW surplus turned into a 1,230-MW shortfall in four zones in MISO's northern and central region, which requires about 101 GW of peak capacity, according to an April 15 presentation by the grid operator's staff. That shortfall triggered "cost of new entry" pricing across all seven zones in the region.

In part, the shortfall was driven by an increase in electricity use as the effects of the Covid-19 pandemic eased, according to Joundi.

Also, although nameplate generating capacity — the amount a power plant can produce at full output — increased in the region since the last auction, accredited capacity fell by 3.2 GW in MISO's north and central region as coal-fired power plants were replaced by wind and solar resources, which are accredited at 15% and 50% rates, respectively, Joundi said. A 100-MW wind farm, for example, counts as 15 MW in MISO's capacity auctions to reflect its overall output.

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Capacity in MISO's southern region cleared at \$2.88/MW-day, up from 1-cent/MW-day in last year's auction. There is a 2-GW surplus in the region, according to Joundi. "We need to see more capacity being built ... but from a reliability standpoint, the system will not be compromised," Joundi said. "But we should expect that as we enter this [capacity] year with less capacity in the north-central region that we are likely to see more usage of the emergency procedures." MISO's northern and central region is at heightened risk for controlled "load sheds," or planned blackouts, Joundi said.

MISO's market is flawed, according to Patton. "If we're going to say that reliability is an imperative, we need to fix this market because we can't expect the market to support reliability if we know that it's not designed to produce efficient economic signals," Patton said during the conference call. The demand side of MISO's market is "mismodeled," which leads to inefficient decisions by market participants, according to Patton. In the last four years, power plants totaling 4 GW to 5 GW retired, even though they appear "clearly economic," Patton said. "Our capacity market doesn't price capacity efficiently, so it sends out a clear economic signal to retire." Potomac Economics didn't find any signs power plant owners withheld capacity, so the auction result was driven by fundamentals, Patton said.

The capacity auction results will increase costs for utilities in the Midwest subregion that were short on capacity supplies for the upcoming planning year, David Sapper, Customized Energy Solutions director of market intelligence for MISO markets, said in an email Monday. In the wake of the auction, calls to change the auction demand curve could get strong cross-sector stakeholder support, according to Sapper. "The market monitor and many stakeholders have long supported moving to some sort of administrative sloped curve, while other stakeholders are interested in strengthening auction scarcity pricing or moving to a voluntary auction with traditional demand bids," Sapper said. It's unclear if stakeholders will support MISO paying to expand the transfer capability between its northern and southern regions to reduce the capacity price difference between the areas, he said.

MISO's capacity shortfall could grow, according to ICF analysts.

In 2023, ICF expects 8.7 GW of retirements and only 3 GW of new accredited capacity across MISO, analysts said Friday in an email. Utilities will likely try to limit their exposure to the auction price volatility by increasing self-supply and bilateral contracts, which would put upward pressure on bilateral contract prices, according to ICF. They said there is an increasing need to reform the MISO resource adequacy construct to provide proper economic signals. MISO could use a sloped demand curve to help set capacity prices instead of a vertical one, which would reduce the price volatility, according to the analysts. The vertical demand curve fails to capture the reliability value of excess capacity, which contributes to capacity prices that are too low to spur investments in new power plants, they said in a research note last week. Potomac Economics estimated that if a sloped demand curve had been used in the 2021 auction, the price would have been \$150/MW-day in MISO's north and central region compared with \$5/MW-day, the analysts noted. MISO's Resource Adequacy Subcommittee is scheduled to review the auction results at an April 20 meeting.

Utility Dive

<http://www.utilitydive.com>

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Gansu Green Power Travels Thousands of Miles to Yangtze Delta

15 GWh of green electricity from Gansu was recently transmitted to Zhejiang.

'This is Gansu's first cross-province and cross-region green power transaction,' said He Xiqing, Executive Director of Gansu Electric Power Trading Company. After the transaction was completed on the e-trading platform of Beijing Power Exchange Center,

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Gansu's green power went directly to Zhejiang through the Ningdong- Shaoxing ± 800 kV UHVDC transmission line.

Rich in wind and solar resources, the potential capacities of wind and solar power in Gansu are 560 GW and 9,500 GW respectively. Up to now, the installed capacity of new energy accounts for nearly half of the total, and the utilization rate of electricity from new energy has increased from 60.2% in 2016 to 96.83% today. In 2021, new energy generation in Gansu exceeded 40 TWh and the carbon dioxide emissions were reduced by about 40 million tons.

At the foot of the Qilian Mountains more than 60 kilometers north of urban Zhangye, Gansu province, wind turbines are rotating with the wind. This is the Pingshanhu Wind Farm. 'All the wind turbines are equipped with wind direction sensors and they will 'follow the wind' automatically', said Zhang Guangtai, head of the wind farm, 'the farm generates 1.50 MWh of electricity in one hour.' On the Gobi Desert in Jinchang City, the blue photovoltaic panels are in orderly array. A tracking system is installed to enable the panels changing the angle towards the sun, and to ensure that the sun shines directly on the photovoltaic panels. It has increased the generation by 20% to 30%. 'The clean energy industry is under rapid and large scale development,' said Ye Jun, Chairman of State Grid Gansu Electric Power. 'By building out-bound UHV transmission lines, the surplus electricity is delivered to central and eastern China.'

In June 2017, Gansu completed and put into operation the Jiuquan-Hunan ± 800 kV UHVDC Transmission Project, the first power line aimed at transmitting new energy power in China. At the Qilian Converter Station, the transmitting end, green electricity from the Hexi Corridor is boosted to 800 kV and then transmitted directly to Hunan. As of now, the Qilian Converter Station has transmitted a total of 94.8 TWh of electricity to Central China, accounting for about 50% of the out-bound electricity from the Gansu power grid, said Li Ningrui, Executive Vice President of EHV Company of State Grid Gansu Electric Power and head of the Qilian converter station.

'In 2022, we will fully implement State Grid's action plan for China's climate goals and vigorously promote the construction of a new energy supply and consumption system based on UHV transmission lines,' said Ye Jun. With the joint efforts of government authorities and enterprises, the Gansu-Shandong UHVDC Transmission Project is in the early stage of approval now. In addition, Gansu has signed agreements on electric power cooperation with Zhejiang and Shanghai, and Gansu-Shanghai and Gansu-Zhejiang UHV transmission projects are also being promoted. 'It is expected that by the end of the 14th Five-Year Plan, the annual out-bound electricity from Gansu will exceed 100 TWh,' Ye Jun added.

At Gansu Dispatching Center, all power generation data are shown in real time on the screen. 'With the new energy generation cluster control system, the total generation and output of each power plant can be controlled smartly,' said Yang Chunxiang, deputy director of the Dispatching Center of State Grid Gansu Electric Power.

The forecast of wind and solar power is indispensable to smart control. 'New energy power forecast is an important technical means to ensure the safe and stable operation of power systems and efficient consumption of new energy,' said Zheng Wei, Chief Expert of Reliability Management at State Grid Gansu Electric Power Research Institute. Based on the forecasted results, the dispatching center can balance the power demand and supply of the whole grid and optimize the operation plan of generating units to reserve space for and improve the consumption of new energy power generation.

In recent years, Gansu has built the world's largest combined wind and solar resources monitoring network composed of 44 real-time wind measuring towers, 18 automatic meteorological photometric stations, and 10 haze and dust monitors etc. 'The data on resources of all wind farms and photovoltaic power plants within the Hexi Corridor can

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be monitored in real time,' said Zheng Wei. In order to improve the accuracy of wind and solar power forecasting, State Grid carried out technical researches such as photovoltaic minute-level ultra-short-term forecasting. 'The yearly new energy power generation forecasted at the beginning of 2021 was 43.2 TWh while 43.8 TWh was actually completed, achieving an accuracy of nearly 99%.'

At the same time, power sources for peak regulation such as pumped storage, chemical energy storage, and thermal power for supporting new energy development are also under construction. 'The Yumen Changma Pumped Storage Power Plant is included in the national mid- and long-term plan for pumped storage, and the single largest electrochemical energy storage power plant in the world has been built and put into operation in Gansu,' said Yang Chunxiang. 'By combining energy storage and new energy power plants into virtual power plants for peak regulation, the peak regulation capacity of the power grid system can be further improved to enhance the stability and reliability of new energy.'

In an industrial park for new energy equipment manufacturing in Wuwei, a set of independently developed wind turbine blades of more than 80 meters in length are being loaded for delivery to Zhangye more than 200 kilometers away. 'The generation has been increased from the original 2 MW to 6 MW with this set of blades,' said Han Xudong, Director of General Management at Gansu Chongtong Chengfei New Materials Co., Ltd. For power generation companies, this means more power is generated at a lower cost. 'Today, the wind turbine blades produced in Wuwei have been sold to many provinces. In 2021, orders of 1,200 sets were delivered with a total value of CNY750 million.'

It benefits enterprises and increases the local people's income. 'The manufacturing of wind turbine blades is labor-intensive, a set of blades requires the close cooperation of more than 200 people,' said Han Xudong. It has provided more than 900 jobs for people from nearby villages and towns. With 3 months of training, they can get started with the job and each earns CNY4,500 on average per month. Li Yumei, a villager from Zhaizi Village, Fengle Town, Liangzhou District, Wuwei, joined the company as a worker in 2015 for the first process of blade manufacturing. 'The job is not strenuous and everyone can get started after training. Now I can earn more than CNY5,000 per month. The more skillful you are, the more you can earn.'

'Last year, our villagers were paid more than CNY100,000 in total for photovoltaic power generation,' said Wang Shouxu, deputy director of the villagers' committee of the Hongguang Xincun Village, Liuba Town, Yongchang County, Jinchang. Some of the income is used for the construction and maintenance of village-level public welfare undertakings and some to pay wages of public welfare jobs. Yongchang County was listed as a pilot county for promoting distributed photovoltaic power in Gansu Province in August 2021. The planned installation capacity is 0.27 GW and the benefited farmers are expected to increase their income by CNY1,000 per year.

According to the CPC Gansu Provincial Committee, Gansu will focus on the development of the clean energy industry and speed up the construction of the Hexi Corridor clean energy base so that the new energy industry will gradually become a main driver and a pillar of the local economy.

SGCC

www.sgcc.com

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Internet Cable to be Laid in Black Sea Connecting Georgia and Romania

Another large project in the Black Sea is in development. On the seabed, an electric cable connecting Georgia and Romania is being built on the seabed.

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A study will be conducted for the economic substantiation of high voltage transmission cable and fiber-optic internet cable, which will be commissioned by the state electricity system and financed by the World Bank.

If the project is implemented, it means that the 1,195-kilometer cable from Georgia will be connected to Romania. According to the World Bank, a preliminary assessment of the project has already been conducted, according to which the existence of such interconnection will have a positive impact on the energy system and economy of both Romania and the South Caucasus. Ucha Seturi, head of the Association of Small and Medium Telecom Operators, says the construction of a new fiber-optic cable connecting Romania will give Georgia a chance to become a digital hub in the region. According to him, given that Internet consumption is growing very fast in the world and in Georgia, the existence of additional Internet connection points, especially in Europe, is important.

"We have an internet connection with all neighboring countries. Our connection with Europe is in the direction of Poti - Varna. We also have accession to Russia in Lars, an accession to our occupant neighbor via Poti-Novorossiysk. We have accession with Azerbaijan and Armenia in 2-2 places, as well as with Turkey in Sarpi and Vale. In other words, we can say that the opportunities for accession have been used," said Ucha Seturi.

According to him, the US State Department also speaks about the importance of the Internet as a strategic object. Ucha, therefore, focuses on the diversification of resources. According to him, it is important to reduce the connections with Russia as much as possible, and the transit, which passed through the northern neighbor, to be transferred to Georgia. "We say that our geographical location allows us to conduct Internet traffic through Armenia and Azerbaijan, including to India and China," said Ucha Seturi.

According to him, the cable opens the possibility for the country to enter the largest companies, which are now represented in Turkey. "It has been so long since we have joined Europe and the giant operators represented in Istanbul have not been able to enter the region. It is good that they have not entered with our neighbors so far. Now there is hope that they will enter Georgia after the construction of the cable," said Ucha Seturi.

According to him, if there is financing, the construction of the cable is possible in 7-8 months, and the construction of the network under the Black Sea should not cost more than 70-80 million euros. Asked who should own and manage the cable - public or private, Seturi said it would be best if the cable was handed over to a private company.

Caucasus Business Week
<http://cbw.ge>

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National Grid Announces Historic Fossil-Free Plan, Launching Bold Clean Energy Vision for Massachusetts and New York

Today, National Grid has launched a path to a more affordable, reliable clean energy future that enables customer choice and combats the increasing threats of climate change. With National Grid's Clean Energy Vision: A fossil-free future for cleanly heating homes and businesses, the company has announced it will seek to eliminate fossil fuel from its gas networks, replacing it with renewable natural gas (RNG) and green hydrogen, while also maximizing energy efficiency and helping customers electrify their heat, if they so choose, in targeted areas.

National Grid acknowledges that Massachusetts and New York have ongoing public proceedings to help guide implementation of the critical plans needed to fight climate change. The company is actively participating in those proceedings and will continue to engage in the public feedback sessions for our states' climate action plans, highlighting the benefits of our fossil-free vision for all residents and businesses.

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Fighting climate change requires significant greenhouse gas emissions reductions across the board. National Grid is tackling those reductions across the power sector, the transportation sector and – with this vision – the building heat sector, which is responsible for nearly 40 percent of emissions in Massachusetts and New York. National Grid's fossil-free vision will not only achieve a net zero energy future, and achieve the climate goals of the states in which we operate, but it will also provide additional, affordable clean energy choices so no customer or community is left behind on our clean energy transition:

- **Affordable Pathway to Net Zero:** Avoids costly and premature equipment upgrades for homes and businesses
- **Adds Clean Energy Choices:** Customers can choose whether to fully electrify or continue using the gas network, which would be fueled by new, fossil-free energy
- **Protects Good Jobs:** Protects thousands of union jobs for uniquely skilled workers
- **Improves Reliability and Resiliency:** Provides added reliability and resiliency through diversification of clean energy sources
- **Cost-Efficient:** Utilizes existing infrastructure, making it more cost-efficient for customers, and continues to utilize our highly skilled workforce

National Grid is committed to bringing this fossil-free vision to life in partnership with policymakers, regulators, and our customers. The report details the critical policies and regulations necessary to help safely, reliably, and affordably achieve this shared net zero vision on behalf of customers, including adoption of a renewable heating portfolio standard.

National Grid's fossil-free and net zero vision creates a clear roadmap for decarbonization and addresses the hardest-to-tackle issues of how to cleanly, affordably, and reliably heat our homes and business in a cold northeast climate. The announcement comes on the heels of National Grid's successful award of an offshore wind lease in the New York Bight in its joint venture with RWE, and an announcement of HyGrid, one of the first green hydrogen projects for blending hydrogen into homes in the US.

Renewable natural gas (RNG) is an immediately available resource released into the atmosphere by decomposing materials at farms, landfills, wastewater, and other sources. RNG provides a double benefit as greenhouse gas can be captured before being released and therefore before it impacts our climate. We can then harness and purify it to flow through our existing infrastructure in place of natural gas, which is a fossil-fuel. This fossil-free energy is a double win in our fight against climate change.

National Grid continues to lead our nation in offshore wind development, and these assets can be used to develop hydrogen through the process of electrolysis. Because the only byproduct of this production process is water vapor, the hydrogen produced is carbon-free. Hydrogen is particularly valuable because it can be stored for future use when conditions are such that our wind or solar assets are not producing high levels of power. This is a fossil-free way to decarbonize multiple sectors including heat, power generation, and transportation.

PR Newswire

<http://www.prnewswire.com>

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New York approves transmission contracts to advance Clean Path NY, Champlain Hudson projects

In a "game changer for New York's transition away from fossil fuels," state regulators approved on Thursday a \$4.5B project by Canadian public utility Hydro-Quebec to supply hydropower to New York City, with construction expected to begin this summer and completion scheduled for 2025.

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New York's Public Service Commission approved the 339-mile Champlain Hudson Power Express transmission line, which will carry 1,250 MW of electricity from hydropower facilities in Canada - enough for more than 1M homes - as well as Clean Path NY, a project that includes more than 20 wind and solar farms and a second transmission line.

The two projects, the largest approved in New York state in 50 years, are expected to reduce NYC's reliance on electricity from fossil fuels by more than half by 2030.

New York's decision to greenlight the Clean Path NY and Champlain Hudson projects marks the state's largest investment in renewable energy and transmission in 50 years, according to the governor's office. Approval of the contracts is "a major step" toward New York's goal of producing 70% of its electricity from renewable resources by 2030, Gov. Kathy Hochul, D, said in a statement. The projects will be a boon to local economies and communities and will "start to reverse the systemic health disparities and poor air quality," New Bronx Chamber of Commerce President Lisa Sorin said in a statement. However, there are some concerns about how the increased demand for hydroelectric power will affect Indigenous communities located near dams.

Several First Nations leaders warned last year that the Champlain Hudson Power Express transmission line would "cause serious and, possibly, irreversible damage to the natural environment on which our communities depend and on which our culture is based." The Champlain Hudson project, which is being developed by H.Q. Energy Services, is already fully permitted and will enable New York City to purchase electricity from Hydro-Québec. Clean Path NY has yet to go through the PSC's permitting process. The project consists of a 175-mile transmission line connecting 3,800 MW of new solar and wind power in the state and the New York Power Authority's existing 1,160 MW Blenheim-Gilboa Pumped Storage Power Plant.

State leaders say the new transmission lines will be underground to "avoid, minimize, and mitigate environmental damages including impacts on sensitive species and habitats and be resilient in the face of extreme weather." Invenergy, energyRe and NYPA are all working together to develop the Clean Path NY project. In conjunction with the PSC's decision, the City of New York confirmed it will purchase a portion of the renewable energy attributes the two projects generate. And the New York State Office of General Services committed to contracting with the New York State Energy Research and Development Authority for Tier 4 renewable energy credits associated with the state's energy use in the city.

The PSC on Thursday also approved a road map submitted by NYSERDA and the state's Department of Public Service to expand the state's NY-Sun initiative. The program can be "a nation-leading blueprint for the development of distributed solar," Hochul said. The framework includes investing \$1.5 billion in ratepayer-funded incentives to extend the program, which officials say will spur approximately \$4.4 billion in private investment over the mid- to late 2020s. The expansion is expected to support 6,000 new solar jobs across New York. It includes wage requirements for projects from 1 MW to 5 MW, and it is designed to deliver up to 40% of the benefits to disadvantaged communities and low- and moderate-income residents.

Utility Dive

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FERC proposes expanded state role in effort to spur transmission development

State utility regulators would have a major role in regional transmission planning and determining how to share the costs of new transmission facilities under a Federal Energy Regulatory Commission proposal released Thursday.

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“States are going to be at the heart of the planning,” FERC Commissioner Mark Christie said during the agency’s monthly meeting Thursday. “States are going to get the opportunity to agree to the criteria, and they’re going to get the opportunity to agree to the cost allocation.”

The proposal requires a regional planning and cost allocation process, but doesn’t dictate specific outcomes, according to Christie. “We’re giving maximum flexibility to the states and the regional planning entities in working out these arrangements,” he said. Increased state involvement could lead to greater success in building transmission lines as well as heightened consumer protections, according to some FERC commissioners. “The proposal aims to facilitate states’ influence and buy-in to regional planning and cost allocation in a manner that respects their jurisdiction and their individual priorities,” FERC Commissioner Allison Clements said. “Because siting of any infrastructure is difficult and should minimize impacts, states’ early participation in the process may help to improve outcomes.” The proposal, approved on a 4-1 vote, aims to encourage long-range transmission planning according to FERC Chairman Richard Glick. “It’s also going to address our nation’s changing resource mix and the changing role of electricity in our society, and that’s clearly coming with electrification,” Glick said. FERC Commissioner James Danly voted against the proposal, saying he feared it was designed to encourage certain types of generating resources and socialize the costs of state and local policy choices. The proposal grew out of an advanced notice of proposed rulemaking, released in July, which sparked two rounds of comments from stakeholders last fall.

On the planning front, the proposal requires regional transmission planners to identify transmission needs using long-term scenarios that include the effects of extreme weather, said David Borden, with FERC’s Office of Energy Policy and Innovation. Planners would need to evaluate the benefits of regional transmission facilities over at least 20 years, starting when they are set to be operating, Borden said during the FERC meeting. They would also have to establish “transparent and not unduly discriminatory criteria” for approving potential transmission facilities that will have their costs allocated, Borden said. The FERC proposal offers a set of benefits that transmission planners can use in assessing the benefits of possible projects. Transmission planners would also have to more fully consider dynamic line ratings and advanced power flow control devices as part of their planning, according to Borden. The requirement could make existing transmission lines more efficient. Chaz Teplin, RMI principal for carbon-free electricity, praised the proposal’s requirement for long-term planning.

“This type of planning is much more likely to connect the regions of the U.S. with valuable, low cost wind and solar to our load centers,” Teplin said in an email Friday. “We are also happy to see that FERC is suggesting that grid planners include transmission’s diverse benefits when allocating costs, an important improvement over the narrow benefits definitions common today.”

State approval for cost allocation

State utility commissions would have to approve any cost allocation methods that are used to determine who pays for regional transmission projects, Borden said.

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Canadian university to be equipped with a stealthy solar façade/microgrid

Mitrex, based in Toronto, is a manufacturer of building-integrated photovoltaics (BIPV). One of the company’s BIPV products is a solar façade, essentially an exterior wall with productive photovoltaics stealthily integrated into a building.

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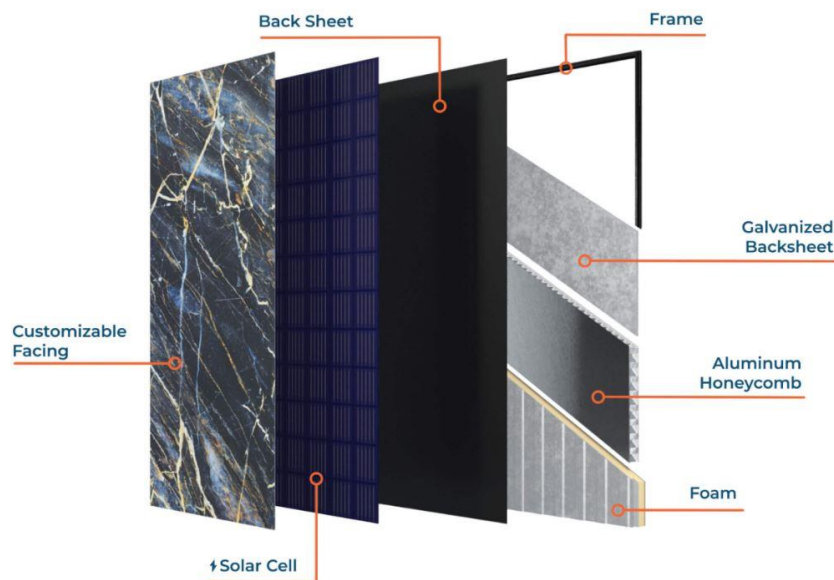
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Mitrex said it is now planning the tallest solar façade in North America, a 6,000 square foot BIPV system that will power a student residence building at St. Mary's University in Halifax, Nova Scotia. The decentralized energy source supplies local energy and is connected with the traditional grid to export excess production. It is also a microgrid, capable of functioning autonomously from the electric grid, and able to operate during power outages.

The microgrid application not only can be used for power resilience during outages but can also be intelligently operated to adapt to economic conditions, potentially providing the university with savings during times of high energy prices and peak demand. Mitrex will work with DSRA Architects, Dillon Consulting, BMR Structural Engineering, to install the project, with construction overseen by EllisDon Corporation and Markland Construction. Construction is expected to be complete in early 2023. Mitrex said the façade will consist of solar cladding, accented by vertical, semi-opaque solar glass integrated into the windows. The design of the cladding panels is planned to be a delicate combination of school colors with a subtle reveal of solar technology, said the company.

The BIPV maker integrates photovoltaics with a myriad of locations, including roofs, railings, façades, windows and more. "Mitrex aims for a future where every sun-touched surface generates energy with visually appealing solar products," said the company in a press release. "The building community needs to think of micro-grids as a must and not an option and rethink their contributions to carbon emissions on every level from carbon used to make the products to powering the structure post-construction," said Danial Hadizadeh, CEO of Mitrex.

Mitrex Solar Façade Layers



Today, construction operations and building materials fabrication cause as much as 40% of annual carbon emissions. Hadizadeh said that he believes BIPV will replace "outdated solutions" to improve the carbon footprint of buildings. The company provides a high level of transparency in the total carbon lifecycle of its products. Mitrex's solar façade panels come in a variety of colors and designs to match the buildings they are integrated with and have a variety of structural designs that can either let the BIPV lay vertical on the wall or be tilted for increased production.

pv-magazine
<http://www.pv-magazine.com>

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Long Ridge Energy Terminal and GE commission & demonstrate first advanced class hydrogen-burning power plant worldwide using GE HA gas turbine

GE and Long Ridge Energy Terminal Long Ridge, a subsidiary unit of Fortress Transportation and Infrastructure Investors LLC (FTAI) and an affiliate managed by GCM Grosvenor announced a successful first step to transition Long Ridge's power plant toward carbon-free hydrogen: following the start of commercial operation achieved in October 2021, the plant conducted a successful demonstration using a hydrogen-blended fuel in GE's HA gas turbine at Long Ridge's 485 MW combined-cycle power plant located in Hannibal, Ohio. The hydrogen blending test was completed on March 30, 2022 at the facility using hydrogen produced as by-product from a nearby industrial facility.

"Our Hannibal power plant is the first GE H-class plant worldwide in commercial operation to blend hydrogen successfully and we will continue to work with GE to lead the deployment of utility-scale hydrogen solutions and sustainable energy storage," said Bo Wholey, President of Long Ridge Energy Terminal. "We are focused on delivering low-carbon, reliable, and cost-effective energy to our customers including local data centers and technology companies. Data centers represent one of the many industries that can benefit from hydrogen-fueled power generation and – supported by GE's advanced gas turbine – we are committed to meeting these needs."

The plant is powered by a GE 7HA.02 gas turbine, which can burn between 15-20% hydrogen by volume in the gas stream initially and is expected to have the capability to utilize up to 100% hydrogen over time. For the demonstration, GE provided an integrated system – GE's H2 Integrated Fuel Blending System – to allow an initial blending of 5% hydrogen by volume and natural gas to demonstrate the capability. The blended fuel was injected to the combustion system of the gas turbine, and further upgrades will allow the power plant to utilize higher percentages of hydrogen subject to fuel availability and economics.

"Gas turbines—whether new or retrofitted—can help the power generation industry reduce its carbon emissions this decade by blending hydrogen with natural gas, and this first-of-its-kind demonstration in a H-Class "utility-scale" gas turbine is a major milestone for GE's and the industry's journey towards lower-carbon power generation," said Scott Strazik, CEO of GE's Global Energy Business Portfolio. "This milestone is built on a great legacy of hydrogen fuels experience across GE's non-HA gas turbine fleets where GE has more than 8 million operating hours burning hydrogen or similar low carbon fuels."

The facility plans to produce hydrogen onsite and is considering the use of below-ground salt formations for large-scale hydrogen storage. In this way, the plant will be able to support a balanced and diverse power generation portfolio in the future and leverage an overall energy storage capability ranging from accommodating seasonal fluctuations related to renewable power, to cost effective, dispatchable intermediate and baseload power.

NS Energy

<http://www.nsenergybusiness.com>

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Innovation for UK networks – ENA roadmap

The UK Energy Networks Association (ENA) has published its first integrated strategy for gas and electricity network innovation. The strategy, which is based on extensive industry consultation, is aimed to enable stakeholders to understand the key priorities for network innovation. It sets out the key principles and themes that will guide network innovation and enable the delivery of safe, resilient networks that facilitate the energy system transition and meet the evolving needs of energy consumers.

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The ENA comments that since the previous network strategy two years ago, the innovation landscape and industry priorities have changed dramatically, with funding streams and mechanisms changing, clearer working partnerships and heightened ambition around reaching net zero. The strategy is centred around three overarching network innovation objectives, which are the three consumer-facing outcome categories set by the regulator Ofgem that underpin all network innovation activity. These are to meet the needs of users, to maintain a safe and resilient network and to deliver an environmentally sustainable network.

The network innovation themes are:

- Data and digitalisation, with the development of new data services and the application of data science methods to harness the power of digitalisation to solve system operation and the wider stakeholder challenges. Near-term priorities including improving the standardisation and interoperability of network data and new approaches to developing and prioritising use cases for the future data-driven networks.
- Flexibility and market evolution, with development and testing of market-based solutions to increase the flexibility and efficiency of the energy system and accelerating adoption of low carbon solutions. Near-term priorities include simplifying flexibility market structures, eliminating barriers to entry for smaller market entrants and developing commercial arrangements for connecting and supplying green hydrogen.
- Net zero and the energy system transition. Near-term priorities include developing market solutions to enable the energy transition for all consumers, enabling the transition to low and zero carbon transport and heating for all users and supporting all consumers to engage in the energy transition.
- Optimised assets and practices, with the development and implementation of industry-leading techniques. Near-term priorities include reducing and mitigating future unplanned outages, exploring innovative methods to train and upskill the workforce and exploring how to future-proof assets and practices.
- Supporting consumers in vulnerable situations. Near-term priorities include exploring how to reduce the financial impact of net zero on consumers in vulnerable situations, understanding how network companies can support the fuel poor and improving network engagement with these consumers.
- Whole energy system transition, with the development of joined-up approaches across sectors and energy vectors. Near-term priorities include exploring data sharing opportunities between networks companies and with other service providers and joining up approaches to regional network planning and forecasting.

The strategy document notes that it is intentionally high level with its intention to inspire and excite the innovation community without being too prescriptive.

The ENA notes in the document that since 2009, the network companies have trialled and tested over 2,000 innovative ideas. Between 2020–2021, 95% of innovation projects included multiple network companies, with 88% involving working with third-party organizations.

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

25 April 2022

German-funded consortium to develop 'battery passport' for Europe

A German-funded consortium of carmakers and battery producers, including BMW, Umicore and BASF, is to develop a "battery passport" that traces the content and carbon footprint of batteries in Europe, Germany's economy ministry said on Monday. The consortium of 11 partners has received 8.2 million euros (\$8.78 million) of government

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funding to develop a common classification and standards for gathering and disclosing data on the batteries, which could soon become mandatory under European Union regulations.

A European Commission proposal due to be discussed later this year states that rechargeable electric vehicles, light transport and industrial batteries sold in Europe must disclose their carbon footprint from 2024 and comply with a CO2 emissions limit from 2027. They must also disclose the content of recycled raw materials in those batteries from 2027, followed by requirements to use a minimum share of recycled cobalt, lithium, nickel and lead from 2030.

The German consortium is the first project in Europe to attempt to design a digital product to meet these regulations, Germany's economy ministry said. Batteries could carry a QR code linking to an online database where EV owners, businesses or regulators could access information on the battery's composition. This digital tool should also make it easier to recycle raw materials inside batteries, the government statement said, which would cut dependence on foreign suppliers which control the vast majority of resources, like lithium and nickel, essential for battery production.

Reuters

<http://www.reuters.com>

26 April 2022

ENTSO-E welcomes Ukrenergo as Observer Member

Today, ENTSO-E is proud to announce that an Observer Membership Agreement has been signed between ENTSO-E and Ukrenergo, marking the beginning of a new chapter in the important relationship between Ukrenergo and all the European electricity TSO members of ENTSO-E.

The European TSOs have formed within ENTSO-E, a community united by a shared responsibility of keeping the lights on in Europe. This agreement with Ukrenergo is a significant step showing the commitment of the European TSOs to strengthening and developing technical cooperation in the security of Europe's interconnected power system.

At the signing of the Observer Membership Agreement, the ENTSO-E President Mr Hervé Laffaye remarked: "On behalf of all ENTSO-E Members, I would like to warmly welcome Ukrenergo into the European family of electricity TSOs. After a successful emergency synchronisation of our grids on 16 March 2022, this Agreement reinforces our strong solidarity with Ukrenergo which continues to operate and maintain Ukraine's transmission power system stability in the most difficult of circumstances. We look forward to opening a new and important chapter in the history of our Association with Ukrenergo as Observer Member."

Ukrenergo's CEO, Mr Volodymyr Kudrytskyi, stated: "We are very proud to become Observer Member of ENTSO-E. This is another important sign of the strong support we receive from our European TSO colleagues. As an Observer Member, we will work on establishing long-lasting and mutually beneficial cooperation with ENTSO-E. I would like to thank all ENTSO-E TSO Members for their great support and warm welcome".

ENTSO-E

<http://www.entsoe.eu>

26 April 2022

DOE Study Shows Maximizing Capabilities of Existing Transmission Lines through Grid-Enhancing Technologies (GETs) Can Reduce Transmission Investment and Increase Renewable Integration

The Office of Electricity has released Grid-Enhancing Technologies: A Case Study on Ratepayer Impact, a report focused on the impacts of integrating Grid Enhancing

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Technologies (GETs) onto existing transmission lines. GETs can defer or reduce the need for significant investment in new infrastructure projects and increase the use of renewables by maximizing the capacity of the current infrastructure. GETs include a family of technologies including dynamic line rating (DLR), power-flow control devices, and analytical tools. The report establishes an assessment methodology and outlines key findings from a case study that evaluates a near-future scenario (2025) in the New York Independent System Operator (NYISO) service area to understand how GETs could impact the region.

Despite NYISO's abundant wind energy resources, the area continues to incur high costs associated with congested transmission lines. The state's goal of providing 70 percent of electricity from renewable energy by 2030 will require a significant investment in transmission. Installing new lines, upgrading existing lines, and building a new substation for increased transmission capacity could result in energy cost savings of \$13.6 million over one year. However, these infrastructure investments, while important, can often take years.

To achieve some of these savings faster, DLR could be leveraged to calculate constraints based on real-time data and power-flow controllers (PFC) could balance overloaded lines and under-used corridors within the transmission network. These technologies would enable system operators to reduce transmission congestion. Blanketing the NYISO system with DLR could provide more accurate situational awareness and efficiency, potentially resulting in \$1.7 million in avoided curtailed energy value over the year. In addition, combining DLR PFC and a new substation to increase transmission efficiencies could result in the savings of energy valued at \$9.1 million.

The findings from these efforts support the Building a Better Grid Initiative that will catalyze the nationwide development of new and upgraded high-capacity electric transmission lines, making the United States' power grid more resilient to the impacts of climate change, increasing access to affordable and reliable clean energy, and creating good-paying American jobs. This initiative is critical to reaching President Biden's goal of 100 percent clean electricity by 2035 and a zero emissions economy by 2050.

[Energy.gov](http://www.energy.gov)

<http://www.energy.gov>

27 April 2022

Spain's Transmission Grid Planning to fast track renewable integration

The Spanish government has approved the 2021-2026 Electricity Transmission Grid Planning, which will guide the development of the electricity transmission networks. The aim of the planning is to bolster renewables within the country's power mix.

Actions included in the plan will size and prepare the transmission grid to integrate a higher share of renewable energy generation and make it available to consumers. With an investment of €7 million (\$7.5 million), the plan will provide the groundwork necessary to develop Spain's infrastructure. The aim is to allow Spain to enjoy high-quality electricity supply while decarbonising its energy model and fighting climate action. The planning includes making greater use of the existing transmission grid, avoiding environmentally sensitive areas and reducing actions with potentially negative effects on the territory.

The projects included in the planning will contribute to achieving significant efficiencies and savings for the system as a whole, currently estimated at more than €1.6 billion (\$1.7 billion) per year. Additionally, 13% of all renewable generation is expected to be connected by 2026, which will require new transmission substations.

This will be in line with the pace set by Spain's National Energy and Climate Plan (NECP). The plan comprises a total of 89 initiatives across the system, including integration of new renewables, development and reinforcement of national and the international interconnections with France, Morocco and Andorra, electrification of railways, enhanced

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support for the distribution networks, improvements in security of supply and the introduction of advanced technologies such as FACTS. Thanks to the development of this infrastructure, it is estimated that by 2026 renewable energy will reach a share of 67% in the national electricity generation mix.

CO₂e emissions are also predicted to be reduced by 66% compared to those recorded in 2019, provided that the full implementation of the Plan is carried out. Similarly, the projects included in the planning will contribute to achieving significant efficiencies and savings for the system by over €1.6 billion (\$1.7 billion). The drafting of the planning followed a rigorous strategic environmental assessment procedure to ensure it is sustainable and environmentally friendly.

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<http://www.smart-energy.com>