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June 2021

June 2021 Newsletter

Individual Highlights:

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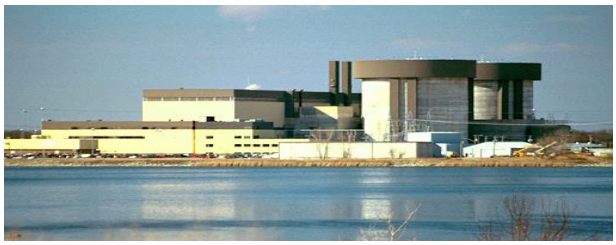
DAD is a son's first hero ….
and a daughter's first love!

Independent Third Party Agrees Subsidies are Needed for Nuclear



"A research and consulting firm, Synapse Energy Economics, hired by the Illinois governor to scrutinize the financial fitness of Exelon's Byron and Dresden nuclear plants approves of limited state subsidies for these facilities. Our analysis demonstrates that Byron and Dresden do face real risk of becoming uneconomic in the near term, the report states. This has implications for Illinois's policy goals because the plants generate carbon free electricity that is currently undervalued or even ignored within current wholesale electricity markets. During the recent winter storm Uri, all six of Illinois' nuclear plants operated at nearly 100% output throughout that storm week, producing enough power to heat 11 million homes and businesses."

A research and consulting firm, Synapse Energy Economics (***Massachusetts -based company***) was contracted by the Illinois Environmental Protection Agency to look into Exelon's claim that it would be forced to close Byron and Dresden in the fall of 2021 because of "market rules that favor polluting power plants over carbon-free nuclear energy."

Their analysis found that limited state subsidies for these facilities is needed for their continued operation. "Our analysis demonstrates that Byron and Dresden do face real risk of becoming uneconomic in the near term," the report states. "This has implications for Illinois's policy goals because the plants generate carbon free electricity that is currently undervalued or even ignored within current wholesale electricity markets."

The state's financial aid suggested by Synapse, however, is substantially less than is currently being provided to Exelon's Clinton and Quad Cities facilities through the state's zero-emission credit program. The ZEC program, created in 2016, secured $235 million annually over 10 years for those two economically troubled facilities. In Synapse's view, Illinois can limit payments for Bryon and Dresden to five years at a cost of roughly $150 million per year at the most.

The report adds that Exelon must be "transparent with its finances to ensure that state support is provided only when required to support the economic operation of the plants."

Exelon's response was the following: "Over the last few months, we have opened up our books and shared all of our financial records with economic analysts. Their conclusions confirm what we have been saying, that without urgent action we are going to lose vital zero-carbon energy sources that provide billions of dollars of economic value to Illinois families and businesses as well as thousands of jobs. We are still reviewing the materials and have questions about the underlying assumptions and price projections. Exelon is committed to working with policymakers and all stakeholders to provide affordable, reliable and clean energy to Illinois families and businesses."

You might recall the recent winter where winter storm Uri took its toll on Texas and the Mid-west. However, all six of its Illinois nuclear plants (***Braidwood, Byron, Clinton, Dresden, LaSalle, and Quad Cities***) operated at nearly 100% output throughout the week of storm Uri, producing enough power to heat 11 million homes and businesses.

"We are dedicated to delivering carbon-free, reliable energy for our customers when they need it most," said Dave Rhoades, Exelon Generation's chief nuclear officer. "We're grateful to our 4,500 Illinois full-time essential workers for accomplishing that goal while managing frigid temperatures and working safely during the pandemic. Our resiliency and commitment to operational excellence ensures reliability, especially during these extreme conditions."

Exelon emphasized that winter resiliency and reliability requires year-long planning and maintenance. "Exelon Generation workers spend months ensuring that backup generators and supplemental equipment is ready for inclement weather," the utility said. "Last fall, operators and maintenance personnel inspected freeze protection systems, tested electrical equipment, and properly aligned plant systems to prepare all Exelon Generation facilities for sub-zero temperatures, icy conditions, and heavy snowfall."

Advisory Board Recommendation Spurs Hope for Sick SRS Workers

"After 14 years of inaction, NIOSH said a formal recommendation from the federal advisory board to the secretary of Health and Human Services is being prepared. The secretary will review this report and recommendation and make a final decision. The secretary's decision will be submitted to Congress and the Department of Labor detailing the final decision. If approved, it will potentially help thousands of sick nuclear workers / subcontractors and their families that worked at the Savannah River Site."

After 14 years of inaction, a federal health advisory board (***Advisory Board on Radiation and Worker Health***) has taken steps, that if they are approved by the Department of Health & Human Services, will potentially help thousands of sick nuclear workers / subcontractors and their families pay medical bills and debts associated with the illnesses they contracted after working at the Savannah River Site (***SRS***).

If they worked at SRS for at least 250 days from 1973 -1990 they would no longer be required to go through the "dose reconstruction process" – this process required, the worker to reconstruction his/her timeline for each dose receive so that a determination could be made on whether their specific radiation exposure had actually caused their cancer. Instead, these workers with cancer and their families will become automatically eligible for benefits without trying to match illnesses to the dose or doses of their radiation. And, If the worker died of cancer, his or her family would also be eligible to apply for these benefits.

The National Institute for Occupational Safety and Health (***NIOSH***) had offered multiple proposals for estimating a person's radiation dose, but they never proved accurate. Several health consultants, who have followed the process for years, said the government should not have continued to take such a hard line when it became apparent it was not possible for NIOSH to determine their dose(s) accurately.

Local construction workers are among the ailing nuclear workers or subcontractors who stand to gain compensation, which in some cases could provide them and their families with as much as $400,000, say attorneys who argued in favor of easing restrictions on compensation for illnesses.

It is not yet known, how many workers and families would be eligible for compensation under the new rules, but a federal meeting transcript shows at least 37,000 construction employees may have worked at the Savannah River Site from the 1950s through the early 2000s.

Although not yet approved, the panel's action is a major milestone in a 14-year-long effort to gain compensation for suffering SRS workers and their families. Those familiar with the process, predict the board's recommendation will gain federal approval because the government has rarely turned down advisory board recommendations similar to the one made for SRS subcontractors.

NIOSH said a formal recommendation from the committee to the secretary of Health and Human Services is being prepared. The secretary will review this report and recommendation from the committee and make a final decision. The secretary will then submit the final decision to Congress and send a report to the Department of Labor detailing the final decision.

Some workers have waited years before getting compensation, while others were denied compensation because they could not show through medical records that their illnesses were mostly caused by work at SRS.

In 2000, the federal government launched a program to compensate people who got cancer and other illnesses from working at federal nuclear weapons complexes during the Cold War. Although, this program has been successful, the "dose reconstruction process" was still required, creating a real problem for many of these workers.

Governor DeWine Repeals HB6 – FirstEnergy Refunds $26 Million

"Do you remember HB 6? It required Ohio residential customers to pay a monthly surcharge of 85¢ and industrial plants would pay up to $2,400/month – beginning the 1st quarter of 2021. This money was to be distributed to FirstEnergy Solutions', which at that time was owner of two Ohio nuclear plants, various Ohio solar projects, and the Ohio Valley Electric Corporation. Ohio Governor, Mike DeWine, signed a bill repealing HB 6 and FirstEnergy announced they will refund $26 million to their customers, from the surcharge revenues they had collected."

On the same day that Ohio Governor, Mike DeWine (***pictured above***) signed a bill repealing the nuclear bailout and other provisions associated with House Bill 6 (***HB 6***), FirstEnergy announced they will refund $26 million to their customers from the surcharge revenues they had collected.

You may recall that HB 6 required Ohio residential customers to pay a monthly surcharge of 85¢, industrial plants would pay up to $2,400/month – beginning the 1st quarter of 2021. This money was to be distributed to FirstEnergy Solutions', which at that time was owner of two Ohio nuclear plants (***Davis-Besse and Perry***), various Ohio solar projects, and the Ohio Valley Electric Corporation (***OVEC***).

Repeal of HB 6 eliminates these surcharges and First Energy said in a release that it is "committed to engaging in a holistic and transparent manner" as part of a months-long review undertaken after the arrests in July of then - Ohio House Speaker Larry Householder and four others alleged to have been involved in a bribery scheme to ensure passage of House Bill 6.

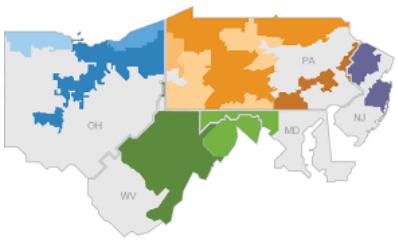
FirstEnergy stopped collecting the surcharge revenues in February to settle a lawsuit with Republican Ohio Attorney General David Yost.

Federal prosecutors claim "Team Householder" used money secretly funneled from FirstEnergy to win passage of House Bill 6, which provided $1 billion to rescue two nuclear plants operated at that time by a FirstEnergy subsidiary, and stop a proposed referendum aimed at repealing the bill. Householder has pleaded "not guilty" and remains a state representative.

The Office of Ohio Consumers' Counsel, which represents the interests of residential electricity customers, had asked the Public Utilities Commission of Ohio to order FirstEnergy to "remedy what would be a miscarriage or perversion of justice" if the company would be allowed to keep the revenue guarantee money.

"Ohio should not allow FirstEnergy to walk away from House Bill 6 with even a penny of consumers' money," Consumers' Counsel Bruce Weston said in a statement. "It is good to see FirstEnergy's announcement today that it will refund these House Bill 6 surcharges to consumers, even if it took legislation and the potential for PUCO action to help FirstEnergy see the light."

In 2019, then- FirstEnergy CEO Chuck Jones, told investors that after passage of the energy bill, the rate guarantee made a portion of the company "recession proof." However, CEO Jones was one of the top executives that were fired after last summer's arrests of "Team Householder".



FirstEnergy's Generation Network

GE Renewable Energy Lands their Largest Onshore Wind Project

"GE Renewable Energy will provide wind turbines for the North Central Wind Energy Project. Three separate wind farms make up this project in north-central Oklahoma. It is being developed and built by the energy firm, Invenergy, for subsidiaries of American Electric Power – PSO & SWEPCO. A typical 2-3 MW wind turbine cost $2-4 Million and will last ~20 years with proper maintenance - operation and maintenance cost typically runs $42 - $48K per year – as they generally require preventative maintenance checkups two or three times a year."

GE Renewable Energy has landed the "largest combined onshore wind project" in its history.

They will provide wind turbines for the 1.48-GW North Central Wind Energy Project - three wind farms located in north-central Oklahoma.

This project is being developed and built by energy firm, Invenergy, for American Electric Power (***AEP***) subsidiaries Public Service Co. of Oklahoma (***PSO***) and Southwestern Electric Power Co. (***SWEPCO***).

These three facilities will require 531 wind turbines to deliver the 1,485 MW total capacity, and the project includes the Traverse Wind Energy Center (***999 MW***), the Maverick Wind Energy Center (***287MW***), and the Sundance Wind Energy Center (***199 MW***).

The Traverse Wind Energy Center will be the largest wind farm in the country when it goes online as scheduled between December 2021 and April 2022.

The Maverick Wind Energy Center is slated for completion in December 2021, but the Sundance Wind Energy Center is scheduled for operation, early this year.

All three projects, when completed, will be jointly owned by PSO and SWEPCO, with PSO at 45.5% and SWEPCO at 54.5%, at an expected cost of approximately $2 billion.

According to AEP, PSO needed and received approval from its Oklahoma regulators. SWEPCO, however needed approval from two regulators, Arkansas and Louisiana. In addition, SWEPCO needed to acquire a fixed-cost turnkey agreement and the Arkansas Public Service Commission, and the Louisiana Public Service Commission had to approve the flex-up option, agreeing to acquire the Texas portion, which the Public Utilities Commission of Texas had denied.

Invenergy

Invenergy also pointed out that in light of the COVID pandemic, global supply chains were and continue to be disrupted, and therefore it was critical that they work with trusted partners, like GE, to develop and build these North Central Wind Energy Facilities.

During the development of this project AEP received a welcomed change from the Internal Revenue Service's (***IRS***). Due to the COVID pandemic the IRS decided to extend the "Continuity Safe Harbor" deadline for one year. Therefore, if construction began in 2018 it would qualify for the "Continuity Safe Harbor" production tax credit (***PTC***).

According to AEP, this extension resulted in the Sundance Wind Energy Center qualifying for 100% of the federal PTC, and the other two facilities qualifying for 80% of the federal PTC.

The American Clean Power Association (***ACPA***) – previously known, until January, as the American Wind Energy Association - reported that the North Central Wind project will be GE's 2nd onshore wind project in the Western Hemisphere that is greater than 1 GW, demonstrating the increased demand for clean, renewable wind energy.

No specific data on the cost was available but the typical wind turbine that is 2-3 MW's will cost $2-4 Million and last approximately 20 years with proper maintenance. Operation and maintenance (***O&M***) cost typically runs an additional $42,000 to $48,000 per year – wind turbines generally require preventative maintenance checkups two or three times a year.

Did You Know?

"That NASA Systems Engineer, Kim Steadman, became interested in engineering at an early age through her love for science fiction books, T.V. shows, and movies, including Star Trek and Star Wars, but initially wanted to become an astronaut. A graduate from Georgia Tech - BS & MS in Aerospace Engineering she began her career at NASA in the Jet Propulsion Laboratory (JPL) and has worked on various missions, including Cassini (Saturn exploration), Opportunity, and Curiosity."

Coal-fired generation ~20%, Natural gas 35%, Nuclear 20%, Renewables 19%

*That based on the January & February statistics from the EIA (**Energy Information Administration**) coal-fired and natural gas-fired generation dominated the domestic energy mix for 2021?* ***Coal-fired generation was ~47 million MW-hrs higher than the first two months of 2020, but its contribution has decreased from its historic position of 35% to slightly above 20% while natural gas remains at the top of the generation mix, providing 35%, nuclear is still holding at 20%, and renewables - wind, solar, & hydro – increased to 19%.***

Southern Power acquired its 15th wind power project - Glass Sands – their 5th in Oklahoma.

*That Oklahoma is now the nation's 2nd leading wind energy producer with more than 3,000 MW installed, and more is planned (**see page 5**)?* ***Southern Power, a subsidiary of Atlanta-based Southern Company, has acquired its 15th wind power project. This one is located in Murray County, Oklahoma – Glass Sands Wind Farm - their 5th wind farm in Oklahoma.*** *Southern Power's wind facility portfolio is 2,533 MW of wind generation and makes up part of the company's 4,928-MW renewable fleet, which consists of 43 solar and wind facilities that are operating or under construction.*

The Orbital 02, the world's most powerful tidal generator, will sit off the Orkney Islands. Its two turbines will provide enough power for 2000 homes in the U.K. Each turbine has a 64-foot rotor, that can rotate a full 360° allowing these turbines to continue operation when the tide changes its direction.

That the ***world's most powerful tidal generator - Obital 02*** *- is almost complete? It was designed and built by Orbital Marine Power, and* ***it is on its way to the Orkney Islands – just off the northeast coast of Scotland.*** *Once operational, connected via the European Marine Energy Center,* ***the two turbines will deliver ~2 MW (megawatts) of electricity - enough to power 2,000 homes in the UK every year.*** *Patterned from their previous generation of large tidal turbines the SR2000 it somewhat resembles a starship. The entire rig is built from steel, yet it only draws 9.8 feet of water.* ***Each of the two turbines has a 64-foot diameter rotor, that can rotate a full 360-degrees allowing the turbine to generate power without the entire structure changing direction when the tide changes direction – allowing adjustment for different tidal directions without the need to yaw the entire structure.***

6 million miles of transmission & distribution lines.

That the nation's complex electricity system consists of 56% power plants, 9% transmission system, and 35% distribution system. ***This system relies on over 600,000 miles of transmission lines to carry the electricity from our power plants and dams to our communities, with another 5.5 million miles of local distribution lines bringing that power into our homes, workplaces, hospitals, churches, schools, etc.***

To Replace the Electric Grid Will Cost $5 Trillion! Are YOU Ready?

"The nation's grid consists of 56% power plants, 9% transmission system, and 35% distribution system. It is currently valued at $1.5 to $2 trillion, but to replace it would cost ~$5 trillion and it is way overdue for an upgrade. It is divided into three main systems - Western Grid, Eastern Grid, and ERCOT. There are only 7 high-voltage DC interconnections between the Western and Eastern Grids with a combined capacity, for all 7 of them, at only 1,320 MW's. ERCOT has 4 interconnections – 3 with the Eastern Grid (2 DC ties and 1 AC tie), and 1 DC tie with a VFT or variable frequency transformer with Mexico.

The U.S. electric grid has been called "one of the greatest engineering achievements of the 20th century" – it is an amazing machine consisting of different integrated systems.

The nation's grid consists of 56% power plants, 9% transmission system, and 35% distribution system. It is currently valued at $1.5 to $2 trillion, but to replace it would cost ~$5 trillion.

This major infrastructure system is way overdue for an upgrade, and infrastructure is an issue that both democrats and republicans say they support, but the "devil is in the details".

Our power grid is divided into three main systems; Western Interconnection, Eastern Interconnection, and ERCOT (***Electric Reliability Council of Texas***).

These three systems operate, almost independent of each other, with very little transfer of electricity between them, but within their interconnection, power is traded between the utilities when it is needed – like during plant outages or shutdowns.

However, if power is needed from one interconnection to another, we have a considerable problem. There are only 7 high-voltage direct current (***HVDC***) interconnections or interties between the Western and Eastern Interconnections, and all were commissioned between 1977 and 2005, with most of them added in the mid-1980s. Each interconnection only has a capacity of ~200 MW, with a combined capacity, of all seven, at only 1,320 MW.

Texas or the ERCOT Interconnection has 4 interties – 3 with the Eastern Interconnection and 1 with Mexico. The Eastern connection is through two DC ties and one AC tie (***located in Dayton, Texas that has been used only once in its history – after Hurricane "Ike" in September 2008***). They also have one DC tie with Mexico via a VFT (***Variable-Frequency Transformer***) on a non-NERC (***North American Electric Reliability Corporation***) system.

Since the majority of these HVDC interties have been in operation for more than 35 years, one way to improve the electric grid would be to expand the interconnectedness of the system by upgrading this equipment, as some of it is still using vacuum tubes. It is a good place to start as it would avoid the most difficult aspects of improving our grid network – the obstacles of permits and right-of-way. Although the capacity gained is not game-changing, it could almost double the present capacity, which is certainly worthwhile.

Another area that could be upgraded without obtaining permits and 'right-of-way' is existing substations. There are many opportunities to enhance the existing substations. Since they serve as a "collection point" for renewables, upgrading them to allow greater power transfer would be another way to upgrade the system.

EPRI (***Electric Power Research Institute***), the National Renewable Energy Laboratory, and other organizations expect our wind and solar capacity to grow from 200 to 800 -1,000 GW (***gigawatts***) by 2030 - requiring additional transmission lines. And it can take 10 years to plan, build, and place into service a new transmission line. The biggest obstacle is 'right-of-way' access but once that is obtained, the builders have to install the towers, run the wires, test the system, link the controls to the ISO or grid control centers, and provide training for the ISO or grid operators – in fact, a decade is sometimes a short timeframe for building a new transmission line.

Naysayers might counter - that greater interconnectedness will not make that big a difference – using the Texas blackouts as an example – as ERCOT lost 46 GW during storm "Uri"– that capacity could never be provided through our interties. However, what could be provided might be lifesaving, and having greater flexibility is never a bad thing.

Manchin Urges the President to Support Our Nuclear Fleet

West Virginia's Senator Joe Manchin, chairman of the Senate Energy and Natural Resources Committee, recently sent a letter to President Joe Biden urging him to support the continued operation of our civil nuclear fleet and to prevent further plant closures. He said that preventing the closure of our existing nuclear power plants is critical to achieving emission reduction goals while ensuring a reliable electrical grid.

While his committee examined the latest developments in the nuclear energy sector, Manchin noted the importance of maintaining the United States' position as a global leader in nuclear energy. "Without new construction or the preservation of the existing nuclear fleet in the U.S., achieving a sustainable energy system will be more challenging and expensive," he said.

Senator Manchin and Senator Lisa Murkowski (***pictured right***) championed the Energy Act of 2020. It was the first modernization of U.S. energy policies in over a decade and provided investments in advanced nuclear technologies - emphasizing research, design, and development programs that will continue to modernize the existing nuclear fleet, train the next generation of professionals, and develop advanced nuclear technologies to reduce emissions in the industrial and transportation sectors.

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