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January 2020

January 2020 Newsletter

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Happy New Year 2020 - A NEW DECADE – A NEW BEGINNING

Let us START the new year with a renewed spirit of accomplishment – through FAITH we can accomplish all things. Let us be willing to go the extra mile and provide benefit to those around us. Let us be considerate of others, accept our short-coming or failure – ever ready to bounce back with a new resolve!

FirstEnergy Solutions Becomes Harbor Energy – After Bankruptcy !

"When FirstEnergy Solutions Corporation (FES) bankruptcy proceedings are completed they will become a new company, Energy Harbor. They will employ ~2,800 people with 150 located at their headquarters in downtown Akron, OH. FES owns and operates two Ohio nuclear stations - Davis-Besse and Perry - Energy Harbor will not only include them but also plants outside of Ohio, Beaver Valley Nuclear Power Station in Shippingport, PA, and coal-fired plants W.H. Sammis in Stratton, OH, and Pleasants in Willow Island, WV."

FirstEnergy Solutions Corporation (FES) has been in bankruptcy since March 2018. The bankruptcy proceedings should be completed by the end of the year. All along, they have announced that after bankruptcy they planned to emerge as an independent and unregulated generation company.

In accordance with these intentions, they have announced that after bankruptcy, they will become Energy Harbor Corporation. The new company will employ ~2,800 people, with 150 located at their headquarters in downtown Akron, OH.

Energy Harbor Corporation will include two Ohio nuclear stations, Davis-Besse, near Akron (*pictured above*) and Perry, near Cleveland, along with coal-fired station W.H. Sammis in Stratton, OH and several plants outside of Ohio - Beaver Valley Nuclear Station in Shippingport, PA, and coal-fired plant Pleasants in Willow Island, WV.

John Judge, FES CEO said, "The company will be a financially secure, independent power producer and a fully integrated retail energy provider with a competitive suite of products for its growing customer base. We will emerge well positioned for long-term value creation and competitiveness in a low-carbon future."

As you may know, Ohio lawmakers passed HB-6 (House Bill 6), a subsidy bill that will dramatically help continue the operation of these two Ohio nuclear plants. HB-6 requires Ohio residential customers to pay a monthly surcharge of 85¢, with industrial plants paying up to $2,400/month – beginning the 1st quarter of 2021. This money will be distributed to FirstEnergy Solutions' two Ohio nuclear plants, various Ohio solar projects, and the Ohio Valley Electric Corporation (OVEC).

However, this bill has several opponents; the natural gas and renewable energy industries along with the "Ohioans Against Corporate Bailouts". Together they pushed for a statewide referendum to put HB-6 to a vote, but they missed a signature deadline - coming up ~46,000 signatures. So, they have sued for additional time to obtain these signatures.

A federal judge ruled on the extension - denying them more time, but then he asked the Ohio Supreme Court to review five questions related to the referendum process. Therefore, the final decision is still on hold.

The NRC just recently approved license transfer of Beaver Valley, Davis-Besse, and Perry to Energy Harbor Nuclear Generation LLC. This was requested by FirstEnergy Solutions with the stipulation that it would take effect after Chapter 11 proceedings for FirstEnergy Solution were completed.

"The NRC staff's review of the license transfer application concluded that Energy Harbor Nuclear Generation LLC is financially qualified to own Beaver Valley, Davis-Besse, and Perry, and that Energy Harbor Nuclear Corporation is financially and technically qualified to operate the plants," NRC said in a statement.

The NRC went on to add, this should have no impact on the scheduled permanent shutdown of Beaver Valley Units 1&2, in 2021, as the plants' existing decommissioning funds will be transferred to new company.

FirstEnergy

Artificial Intelligence – Here to Stay and the Future for "Smart Grid"

Did you know artificial intelligence is already part of your life?

When you see a recommendation for a product or a movie you might like to watch, artificial intelligence (AI) is behind this matchmaking.

"Intelligent robotic process automation will emerge as business critical, as companies will require the high automation level necessary to become intelligent enterprises for the future. Although it is currently touted as a great asset for repetitive and laborious tasks, like payroll processing, it often brings a high price tag, threat of job disruption and the potential for misalignment of machine goals versus human goals. But people like Elon Musk and Stephen Hawking say to proceed with caution. "

Whenever you give Siri or Alexa a command, AI is providing the language processing – it not only deciphers but generates speech back to you. It's everywhere and most likely being used by your utility, but if it's not, it will be soon!

To understand it, we need to look back to 1956 when a team of researchers and scholars, from Dartmouth, Harvard, IBM and Bell Labs, teamed up at Dartmouth College to get it all started. They believed that a "truly intelligent machine" would be able to carry out activities described as self-improvement.

Merriam-Webster defines AI as "a branch of computer science dealing with the simulation of intelligent behavior,"

Now, 50 years later, AI is touted as a great asset for repetitive and laborious tasks, like payroll processing; it doesn't tire and won't complain about late-night shifts. When put to the right use, machines make fewer errors than people. But, along with the feared robot take-overs, AI often brings a high price tag, threat of job disruption and the potential for misalignment of machine goals versus human goals.

Ultimately, proponents want it to simulate intelligent behavior, but to accomplish this, processes such as, reasoning, learning and self-correction must be developed, and they are still in the making.

Narrow artificial intelligence is AI designed to do ONLY one thing – thus the name. It draws on pattern recognition based on its ability to correlate data, such as, weather forecasting, recommending other items to an online shopper or a movie watcher It can only do the one thing – if designed to predict the weather it could not recommend a TV show, for example.

Artificial general intelligence (called AGI) would ultimately be able to perform any intellectual task a human being can do, but just as a human learns to walk - through trial and error - an AGI machine will have to learn through the process of attempting various tasks. When this occurs, the goal of self-improvement will be reached, however, it will likely be another two decades before artificial intelligence reaches this level of sophistication.

Artificial superintelligence (called ASI) would ultimately surpass human reasoning, intellect, and cognition, and is what makes people like Elon Musk and Stephen Hawking say to proceed with caution, as it could potentially pose an existential threat to humanity if the machines develop an independent streak.

Machine learning (ML) is a subset of AI. It enables a machine to utilize algorithms and statistical models to identify patterns, make inferences, and make decisions or predictions without specific prior programming for these tasks – the beginning of self-improvement.

Neural network is a loosely modeled version of the human brain and explained as - each connection, like the synapses in a biological brain, transmits a signal from one artificial neuron to another - the artificial neuron receiving the signal, processes it, and then signals additional artificial neurons connected to it, to perform the appropriate task. We currently see artificial neural networks being used with self-driving cars, earthquake predictions, image (face) recognition and more.

Artificial intelligence is currently used to help the utilities plan operations and investments more efficiently and effectively. It's utilization with the "smart grid" is critical for operations in the future. We plan to provide additional articles on AI in 2020 so "stay tuned".

NextEra & Entergy Extend Solar PPA Collaboration in Arkansas

"Once completed, the 825-acre Chicot Solar Energy Center near Lake Village, will be the largest solar power facility in Arkansas."

Construction has begun on Chicot Solar Energy Center in Arkansas. Florida-based NextEra Energy Resources will build and operate the site, while Entergy Arkansas will buy the power under a 20-year power purchase agreement.

Once completed, the 825-acre Chicot Solar Energy Center near Lake Village, will be the largest solar power facility in Arkansas – superseding Stuttgart Solar Energy Center, which came online last year.

"Entergy Arkansas is already the largest solar provider in the state, and this project allows us to increase what we can provide for our customers," said Laura Landreaux, president and CEO of Entergy Arkansas. "Large-scale, universal solar allows us to provide the benefits of renewable energy to all of our 700,000 customers at an economic price."

Chicot will feature approximately 350,000 photovoltaic solar panels with a capacity to generate 100 megawatts of electricity, or enough to power more than 18,000 homes.

According to Chief Operating Officer Paul Hinnenkamp, Entergy's long-term plan is to add as much 3-4 GW of renewable energy resources to their generation mix over the next 11 years.

Southern Power Acquires Skookumchuck Wind Project in WA

"The 136-MW Skookumchuck Wind Facility, made-up of 38 wind turbines, is Southern Power's first wind acquisition in Washington State."

Southern Power, the wholesale energy wing of Southern Company has acquired its 12th utility-scale wind project in Washington. It is the first wind acquisition for Southern in Washington State - the 136-MW Skookumchuck Wind Facility from RES (Renewable Energy Systems) is located in Lewis and Thurston counties.

"This project is a great addition to our renewable portfolio," said Southern Power President Bill Grantham. "We continue to strive to develop clean, safe, reliable and affordable wholesale energy resources for the benefit of our customers."

Construction is underway, and it is scheduled for commercial operation in the first quarter of 2020.

With the addition of Skookumchuck Southern Power's wind portfolio will grow to more than 1,960 MW of wind generation.

Southern Power's wind facilities are part of their renewable fleet, which is up to 3,190-MW – 40 solar and wind facilities either currently operating or under construction.

Once operational, the renewable energy credits generated by the facility will be sold under a 20-year power purchase agreement with Puget Sound Energy, which will utilize the resource to meet the electricity demand of their Green Direct product customers.

Southern Power

Site Use Permit Granted for Oklo Inc. - Aurora Advanced Reactor

"Aurora is an advanced fission reactor design developed to power communities with affordable, reliable, clean power. The sloped roof serves to support the solar panels, which also serve as a canvas for local art. Solar panels are included as part of the Aurora design to illustrate how an advanced fission reactor and renewables can work together in a high reliability, clean energy microgrid."

In February 2016, the DOE (Department of Energy) issued a site use permit to Utah Associated Municipal Power Systems for NuScale Power's small modular reactor (SMR) design, which they planned to own and operate on a site at the Idaho National Laboratory (INL).

Since that time, building on lessons learned from the permitting experience for the NuScale SMR, INL established a more streamlined process for obtaining a site use permit.

Since then, Congress has passed several bills that would promote U.S. advanced nuclear technology, and recently the DOE announced they have granted another site use permit for Oklo Inc., developer of a compact fast reactor, to build their 1.5-megawatt Aurora nuclear reactor design at the INL.

Oklo Inc., a California-based company, is the first company to complete the new site use permit application process, which the Energy Department's Idaho Operations Office established about two years ago. The project is still subject to environmental analysis by the Nuclear Regulatory Commission (NRC) under the National Environmental Policy Act.

The site use permit comes after Oklo entered into a memorandum of understanding in 2017 with the Energy Department - that Edward McGinnis, then principal deputy assistant secretary of the Office of Nuclear Energy, told members of the House Energy and Commerce subcommittee in May 2018.

This site use permit is viewed as a critical milestone on the pathway for Oklo's Aurora plant design, as they intend to submit a license application to the NRC within the next few months, following pre-application talks.

Oklo describes Aurora as an "advanced fission clean energy plant design developed to power communities with affordable, reliable, clean power." The Aurora "powerhouse" includes a "fission battery" which uses metallic fuel. It can produce about 1.5-megawatt of electrical power and can also produce usable heat, the company says.

"The Aurora is built on years of technology research, development, and demonstration done at the US national labs and universities, and work done by Oklo to make the Aurora possible," Oklo CEO Jacob DeWitte said. "While heat and electrons are the product, the Aurora powerhouse is the main point for community interaction. We spent years thinking about how it could look, how it would function, and how it would become a point of pride in a community."

The company claims Aurora offers "many unique and beneficial attributes" including the ability to produce power for decades without needing to refuel, its small size, the placement of the fuel underground, the ability to operate without needing cooling water, the demonstrated natural shutdown behavior of the fuel, and the use of a fission spectrum which can recycle fuel and ultimately convert nuclear waste to clean energy.

The Aurora powerhouse's sloped roof serves as the support for solar photovoltaic panels, which "also serve as a canvas for local art which will be developed in tandem with the communities that choose the Aurora as part of their low-carbon microgrid," the company says. "Oklo has been intentional to include solar panels as part of the Aurora powerhouse to illustrate how advanced fission and renewables can work together in a high reliability, clean energy microgrid."

Did You Know?

"That Dominion Energy, one of the nation's largest energy producers, partnering with Vanguard Renewables is launching a $200 million effort to convert methane from cow manure into natural gas. They estimate the project will reduce emissions equivalent to taking ~100,000 cars off the road for a year. The partnership will develop and operate conversion facilities at dairy farms across the U.S. - Georgia, Nevada, Colorado, New Mexico, and Utah. Dominion has a similar partnership with Smithfield Foods - converting methane from hog farms into natural gas."

	That the ***Nuclear Regulatory Commission (NRC) received a grade of "D minus" for IT (information technology) modernization*** on the most recent biannual Federal Information Technology Acquisition Reform Act scorecard, which rated federal agencies' IT management. They did also note that the NRC has shown improvement!
 ***Making energy from poultry waste***	That ***Duke Energy and a consortium of other utilities are securing poultry waste renewable energy certificates (RECs) from*** a $32 million Pitt County facility that recently started operation. The ***Carolina Poultry Power facility in Farmville is making energy from poultry waste*** to generate 2 MW of power and 75,000 tons of steam per hour – using more than 230 tons of turkey waste a day. Carolina Poultry Power is 100% owned and operated by the Power Resource Group.
 ***Lordstown Motors to make Electric Pickup***	That ***GM and South Korea's LG Chem*** are ***teaming up to invest with Lordstown Motors Corporation to build*** a battery-production line and an electric motor-manufacturing line inside the former General Motors Lordstown complex in Ohio. An ***all-electric pickup*** is planned, and the money will be used to retool the 6 million square foot plant for production. When completed it will be one of the world's largest battery facilities.
House approved funding for Plutonium Pits	That the ***House of Representatives has approved the fiscal year 2020 National Defense Authorization Act, a $738 billion defense policy bill that includes support for producing 80 plutonium pits per year by 2030, mostly at the Savannah River Site in South Carolina.*** The bill still needs Senate approval. However, Dan Brouillette, our newly confirmed ***Secretary of Energy, said*** during his nomination hearing that he would remove the cache of defense plutonium from Nevada that was dispatched from South Carolina last year.
 ***Arizona utility regulators question APS chief executive over billing mistakes and political spending***	That ***Arizona utility regulators question the new Arizona Public Service (APS) chief executive Jeff Guldner over billing mistakes and political spending. An online tool that was supposed to tell customers their cheapest power plan - instead steered about 12,000 people to higher-cost options.*** APS has taken the faulty tool offline, promised to fix it, and said it will issue refunds to the affected customers. ***Prior to this mishap***, ***Commissioners had lit into Guldner and other top APS executives, saying they schemed to control electricity regulation through lobbying and millions in political spending, growing wealthier while some of their customers struggled to pay their bills***. A much-criticized rate increase was granted in 2017 that increased bills greater than the 4.5% advertised, and the company is once again seeking a rate increase.

Don't be Fooled - Battery Energy Storage – It Is Not Cheap !

"Do you know what you currently pay for a kilowatt-hour (kWh) of electricty? Battery energy storage is on the rise – but it is not cheap! Battery prices, which were above $1,100 per kWh in 2010, have fallen 87% in real terms to $156/kWh in 2019. By 2023, the average price is expected to be close to $100/kWh. Since you own the battery, you need to consider all the costs involved, which includes maintenance and disposal costs – and overall it will cost you well over $0.40 per kWh. My latest bill was $147.29 including taxes, etc. for 1031 kWh – about $0.14 per kWh."

Battery Energy Storage is on the rise, but it is not cheap. Batteries for a Battery Energy Storage System (BESS) were above $1,100 per kilowatt-hour (kWh) in 2010, but they have dramatically fallen since then - down 87% to $156/kWh in 2019. It is expected that by 2023 the average price will be close to $100/kWh. This may sound pretty cheap, but if you look at it over the life of the battery (*about 2-3 years or 300-500 charge cycles*) and add to it, cost for maintenance and disposal of the batteries - this battery storage capability will cost you well over $0.40 per kWh.

Do you know what you currently pay for a kWh from your electric utility? My latest bill was $147.29 including taxes, etc. for 1031 kWh – about $0.14 per kWh.

Despite the costs. battery energy storage is still increasing; residential energy storage has steadily grown since the slump experienced - late last year - due to supply challenges. More growth is projected, especially from California due to the power safety shutdowns they have experienced due to fires, over the past few years. Although the commercial sector has seen two straight months of pull back, the wild card in all of this is the utility sector – their peaks historically set the records.

Front of the meter is a term used by the electrical industry - it is the electricity, including the system needed to deliver it to your electric meter – hence the term "front of the meter". If we look at battery energy storage from a state-wide and "front of the meter" deployment, Massachusetts is the clear leader. Their SMART program deployed 58 megawatt-hour (MWh) in the last quarter of 2019. Vermont and Arkansas tied for second at 24 MWh each.

California and Hawaii led the residential and commercial energy storage markets with roughly similar volumes, but when you consider the size of California's energy spectrum, it's obvious that Hawaii is making serious moves in battery energy storage – which makes sense based on their physical location and their plans to become energy independent with zero carbon-emissions.

However, the BIG story is going forward, although battery energy storage has been growing as fast as factories can be built - from 2019 into 2020, the market is expected to triple, and from 2020 into 2021 it is projected to more than double, and by the end of 2024, they predict another doubling will occur.

According to economic analyst, the battery energy storage system (BESS) market will continue to grow. They estimate it will reach $2 billion by 2020, $4.2 billion by 2021, and $5.4 billion by 2024. This will result in increased costs for electricity, whether you have your own system, or you are utility supplied. If you decide to go on your own, you should consider maintenance – batteries require it, trickle charge along with test discharge and programed recharge if you want these batteries to provide power when your solar or wind is unavailable.

Dan Brouillette – Confirmed as U.S. Secretary of Energy

Dan Brouillette, a former lobbyist for the Ford Motor Company, sailed through his Senate confirmation vote as Secretary of Energy with a 70 to 15 in favor of his confirmation.

He promised to fight for the Department of Energy's (DOE) budget, although the administration has proposed cutting some agency programs by more than half and eliminating some key research and development programs like the Advanced Research Projects Agency-Energy. The bulk of the DOE budget goes to nuclear weapons research, development, maintenance, and cleanup.

Mr. Brouillette also walked a fine line on climate change. He described global warming as "something we need to work on" but questioned the scientific consensus that climate change poses a serious threat. He promoted statistics that showed how American emissions have fallen 13% since 2005 but showed concern that the reduction in our greenhouse gases was being nullified by rising emissions from China. He went on to criticize the Paris Agreement, which is in-line with the current administration – as they intend to abandon it next November.

Since 2017, he has been Mr. Perry's second-in-command at the Department of Energy. During this timeframe he has helped to promote the administration's policy of "energy dominance" - expansion of oil and gas drilling to bolster U.S. fossil fuel exports. "I'm proud to have been a small part of the incredible success we have seen in American energy," Mr. Brouillette told lawmakers at his Senate confirmation hearing.

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