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November 2021

November 2021 Newsletter

Individual Highlights:

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OVER 40 YEARS IN BUSINESS

2020 BEST of the Upstate Greenville News

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- ***Jackie Pate, Administration***
- ***Sid Crouch, Chief Technical Consultant***
- ***Ken Schaaf, NRC Exam Developer***
- ***Pat McHale, Consultant***

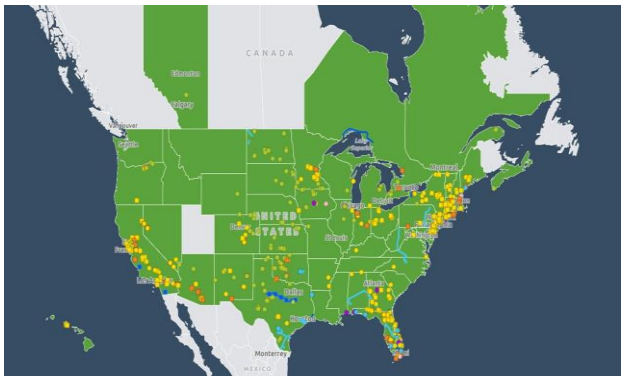
It has been another tough year for many of us, but in this season of thankfulness, we are GRATEFUL!

Yes…WE are grateful for YOU, our employees.

Gratefulness is one of life's greatest necessities. It is a state of mind which allows peace and tranquility, within us. So, let US channel our thoughts and be grateful for all those who have helped us achieve today, yesterday, and hopefully tomorrow.

We thank you for all your contributions. Your zeal to achieve excellence by doing your best, every time – the first time. This is what makes all the difference, and WE are so GRATEFUL!

NextEra's Plans Rebuffed by Duke Energy but Interest Still Prevails



"NextEra Energy recently made a takeover approach to purchase Duke Energy, but Duke rebuffed it, but their interest still prevails. NextEra certainly has the market value to make it happen - about $139 billion – and they are the largest public utility company in the U.S. NextEra owns Florida Power & Light, which has more than 5 million customers in Florida, and Gulf Power, which has 470,000 customers in eight counties in northwest Florida. They are now largest rate-regulated electric utility in the U.S. – climbing from 30th in 2001 to number one. However, should this ever happen, NextEra would have to satisfy an array of government officials in a highly regulated industry."

Did you know that NextEra Energy recently made a takeover approach to purchase Duke Energy, but Duke Energy rebuffed it?

However, should such a deal happen – it would be a very BIG deal.

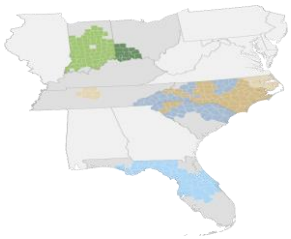
Duke Energy has a market value of roughly $61 billion and acquisition of Duke Energy by NextEra Energy would be the largest utility deal ever and the biggest merger so far this year.

To do this would require NextEra to overcome any resistance from Duke and its executives, and hostile deals in the utility industry are very rare. In addition, such a deal would have to pass muster with an array of government officials in a highly regulated industry.

However, NextEra has the market value to make it happen - about $139 billion – and they are the largest public utility company in the U.S. (***resources map above***). NextEra owns Florida Power & Light Co., which has more than 5 million customers in Florida, and it is the biggest rate-regulated electric utility in the U.S. – based on retail electricity produced. NextEra also owns Gulf Power Co., which serves more than 470,000 customers in eight counties in northwest Florida. Utility investors see Florida as a particularly desirable market given the constant need for air conditioning and a growing population.

NextEra also owns a clean-energy business that, along with its affiliates, is the world's largest generator of renewable wind and solar energy. They also provide emissions-free electricity at nuclear plants located in Florida, New Hampshire, Iowa, and Wisconsin.

Duke, on the other hand, provides electricity to roughly 7.7 million retail customers in six states (***pictured below***), including the Carolinas, some Midwestern states and Florida, and distributes natural gas to more than 1.6 million customers in Ohio, Kentucky, Tennessee, and the Carolinas.



Duke also has a commercial business with power-generation assets in North America including a formidable renewables portfolio and provide carbon emission-free electricity at 6 nuclear plants across the Carolinas – Brunswick, Catawba, Harris, McGuire, Oconee, and Robinson.

NextEra has been an active acquirer of smaller assets in recent years and have shown an interest in larger deals, before their approach at Duke Energy. Just recently announcing their acquisition of GridLiance (***GridLiance Holdco, LP & GridLiance GP, LLC***), an independent transmission company for $660 million, including the assumption of debt.

NextEra is a renewable energy giant – they use tax subsidies to help finance their wind and solar projects around the country and thus far have avoided debt. It then sells the renewables output to utilities, many of which must procure power from green sources in order to meet their state mandates. This has propelled NextEra from being the 30th largest U.S. power company in 2001 to the largest today.

NextEra, however, have had their share of challenges and failures; for example - regulatory pushback and the phasing out of certain tax credits, Texas regulators rejecting their bid for ONCOR (***transmission company***) in 2017, and Hawaii regulators rejecting their bid for the state's largest utility in 2016.

Electrical Sector Sees Flaws in Clean Electricity Performance Plan

"The Clean Electricity Performance Program (CEPP) is receiving resistance from many unlikely organizations, such as FERC, TVA, several public power utilities, and industry groups - including the American Public Power Association and the National Rural Electric Cooperative Association. Many of these companies purchase power from utilities and do not produce their own power. Therefore, they would be on the hook for meeting a 4% annual increase in clean energy, something they cannot do – resulting in penalties they and their customers would have to pay."

Some experts within the electrical sector see flows within the Clean Electricity Performance Program (***CEPP***), part of the Reconciliation Package that is the centerpiece for President Biden's climate change plans. It is receiving resistance from unlikely organizations, FERC (***Federal Energy Regulatory Commission***) and TVA.

A member of the FERC, James Danly, warned that this electricity plan was like dropping an "H-bomb" into the energy market and it would "saddle" the utilities.

The Tennessee Valley Public Power Association (***TVPPA***) warned in a letter to House and Senate leaders that the CEPP would leave them with the obligation to add new clean power but withhold from TVA "the very tools it would make available to all other utilities in the nation in order to finance these resources."

Doug Peters of TVPPA raised concerns, that 150 local electric companies that purchase power from TVA, would be on the hook to meet the 4% annual increase in clean energy. This is something they cannot do. because most of them do not generate their own electricity. Therefore, they would be charged penalties that they and their customers would have to pay. Without changes made to the CEPP, 10 million customers in the Southeast "will be at a significant disadvantage".

CEPP's broad-brush approach currently exempts TVA and other wholesale providers from complying because they don't directly deliver power to homes and businesses. That puts the local electric companies at the mercy of their wholesale providers. including penalties, they would have to pay if they don't meet the annual clean energy growth target of 4%.

Investor-owned utilities have shareholders to help foot the bill, even if the costs can't be passed along to the customers, but the public power companies, including municipalities and cooperatives, don't have that option. And several public power utilities and industry groups including the American Public Power Association and the National Rural Electric Cooperative Association have raised this issue with the CEPP.

However, some grid reliability experts believe the CEPP would protect grid reliability while speeding up decarbonization. "We believe the electric power industry and the regulatory frameworks in which they operate are well-prepared to implement the CEPP while maintaining the high levels of reliability that are critical for our human, societal, and economic well-being," they said in a letter.

Some electricity leaders have also spoken out in favor of the CEPP, such as Ralph Izzo, president, and CEO of Public Service Enterprise Group (***PSEG***).

Energy Secretary Jennifer Granholm, called it the "long pole in the tent" for President Biden's efforts to tackle climate change. "It is more than just renewables, it is also nuclear, making sure we have clean, dispatchable baseload power."

However, the nuclear electric sector is not in total agreement. Although the CEPP does count nuclear as a clean fuel, one pro-nuclear group - Breakthrough Institute - say it could make it more expensive to close down Diablo Canyon (***California nuclear plant***). Shuttering the state's largest nuclear power facility, could cost an additional $500 million to $1.5 billion in penalties and potential federal payments.

Meghan Hammond, an associate with the Pillsbury Winthrop Shaw Pittman law firm, sees the CEPP valuing nuclear as clean energy - the same as any other clean energy. She noted that utilities that already use nuclear power would be able to factor that into their certified clean electricity percentage, giving them a motivator to keep nuclear power running.

In addition, analysts say it could boost future nuclear development as well by sending a message to the investment community.

NRC Extends Policy –- No Heavy Water to China General Nuclear

"In the interest of national security, the NRC has extended a policy consistent with the Atomic Energy Act of 1954, as amended."

Citing national security interests, the Nuclear Regulatory Commission (***NRC***) has issued an order suspending the general license authority to export radioactive material and deuterium (***heavy water***) to China General Nuclear (***CGN***) and its subsidiaries or related entities. Notice of this order was published in the October 1 *Federal Register*.

The NRC issued the following statement: "The executive branch has determined that suspending general license authority under 10 CFR Part 110 for exports to CGN, CGN subsidiaries, and related entities is necessary to further the national security interests of the United States and to enhance the United States common defense and security consistent with the Atomic Energy Act of 1954, as amended."

In 2016, the U.S. indicted CGN and a Taiwan-born naturalized U.S. citizen, as well as his corporation, for "conspiring to unlawfully engage and participate ... in the development and production of special nuclear material" in China without proper legal authorization.

And in 2018, the Trump administration issued a similar order, banning civil nuclear exports from the United States to China. That policy was instituted as a means to prevent China from illegally diverting U.S. nuclear technology for military or other unauthorized purposes, and the current order extends this policy.

Gas-Fired Power Plants Needed at OPPD for Grid Balance & Backup

"Omaha Public Power District plans to have two gas-fired power plants - Standing Bear Lake & Turtle Creek - totaling 600 MW in capacity, to be up and running by 2023"

Omaha Public Power District (***OPPD***) has awarded the engineering, procurement, and construction (***EPC***) contract for two new gas-fired power stations – Standing Bear Lake & Turtle Creek - to support its future solar energy goals. The Nebraska municipal utility plans both gas-fired power plants, totaling 600 MW in capacity, to be up and running by 2023.

Design work is underway and major construction expected to begin on both projects in the first quarter of 2022, according to Zachry Group – Zachry Group has been selected to lead the projects.

Standing Bear Lake Station will be a 150-MW facility in Douglas County, while the 450-MW Turtle Creek will be located in Sarpy County.

Both projects are part of OPPD's "Power with Purpose" initiative first outlined in 2019 - centered around the 400 to 600 MW solar installations, that would need gas-fired capacity for backup and balancing.

Standing Bear Lake will use reciprocating engines to provide quick response capabilities, while Turtle Creek is planned as a simple cycle turbine power plant.

At Standing Bear Lake, the nine Wartsila multi-fuel reciprocating engines can be adapted to run on hydrogen blends. And at Turtle Creek, their Siemens gas turbines can be adapted to run on a 30% hydrogen mix, which Siemens claims will lower their carbon emissions.

Energy Crisis – Is the Future Higher Prices or Rolling Blackouts?

"It's no longer business as usual. Energy market experts are warning that the runaway natural gas prices are likely to ratchet up the demand for crude oil due to the switch from natural gas-to-oil and exacerbate the current oil supplies that are already in a supply deficit. The green transformation has stymied oil and natural gas production and without their increased production, markets prices will have to reach a level where they trigger demand destruction."

Have you noticed how natural gas prices have surged to the highest levels since 2014?

Now natural gas prices are affecting crude oil as well, as utilities and consumers look for cheaper fuel. In fact, we have seen power producers do an about face - switching from natural gas to oil, especially in Europe where natural gas prices increased to a value equivalent to $240/barrel of oil, making the $100/barrel oil look cheap in comparison.

Although this began several months ago, in Europe, it has spread across the globe.

European leaders, in an effort to force movement to more renewables decided to increase their carbon tax by 140%.

This instead, due to the unreliability of renewables and their high cost, resulted in the utilities and consumers moving to natural gas. But with the combination of supply shortages and lower-than-expected power generation from renewables the utilities had to resort back to coal and natural gas to maintain the baseload requirements needed for the electrical grid. This in turn has put a real monkey wrench in zero carbon emission plans by 2030.

Today, energy market experts are warning that runaway natural gas prices are likely to ratchet up the demand for crude oil, as utilities have made a switch from natural gas-to-oil. This will exacerbate the current oil supplies that are already in a supply deficit.

Oil prices have vaulted to multi-year highs after OPEC opted against increasing output above the levels they are already providing, and the current administration green movement has discouraged any positive movement in the U.S. oil and natural gas production. It's no longer business as usual. The big difference this time, is the focus on ESG.

ESG is defined as Environmental, Social, and Governance. This criterion is used to determine a company's position and impact on things like climate change, carbon emissions, water use, conservation, anti-corruption, diversity within its workforce, human rights, and community development.

The green transformation has stymied oil and natural gas production and without their increased production, markets prices will have to reach a level where they trigger demand destruction.

Analyst, such as JP Morgan, believe oil could see $150/barrel by the end of 2022, while others say it could go higher - $180/barrel – this could result in gasoline prices at $4 to $5 / gallon. We are already seeing these prices in New York and California.

All of this will ultimately affect electricity prices, as well. As the U.S. has moved toward the goal of zero carbon emissions, utilities have steadily retired their fossil fuel plants (***coal, oil, and natural gas***). And in many of these states the nuclear plants have also been retired. In fact, 18 nuclear plants have been retired since 1990. This loss of baseload power plants has resulted in a reliance on natural gas-fired power plants or renewables for baseload. But, renewables are not reliable without backup, and without natural gas-fired plants as a backup, then battery energy storage system (***BESS***) must be the answer. However, no utility to date, has installed enough BESS to backup all their renewables. So, if you live in one of these states or areas - it is either higher prices or rolling blackouts.

Did You Know?

"That Catherine Stempien (pictured below), president of Duke Energy Florida, is implementing Duke Energy's Clean Energy Connection (CEC) Program. She says this program will deliver what our customers want — affordable clean energy options, as well as a measurable way for our customers to share in reducing carbon emissions. Duke Energy Florida plans to invest $1 billion in utility-owned solar power plants, now that Florida PSC has given its approval. "

*That **Nuclear Energy is a major driver of the U.S. economy, contributing $60 billion annually and supporting more than 100,000 direct jobs?***

Mossy Branch Battery Facility near Columbus, GA will be a 65-MW / 260-MW-hour facility

*That **Georgia Power is going to build and operate the first standalone battery energy storage system (BESS) on the state's transmission grid? By standalone – it will not be paired with solar or wind—and will connect to and charge directly from the electric transmission grid.** Wartsilla will provide the projects engineering, procurement, and construction services already approved by the Georgia Public Service Commission. The **Mossy Branch Battery Facility will be a 65-MW / 260-MW-hour grid-charging battery energy storage system located in Talbot County near Columbus, Ga. It will connect into the Georgia Integrated Transmission System and will be part of a larger future 80-MW BESS portfolio** already approved in Georgia Power's 2019 integrated resource plan.*

California's carbon-free movement has suffered a major setback – 15% of their grid capacity is fossil-fueled backup generators

*That **California, in their attempt to eliminate carbon emissions within its power sector, had to recently make a turn around and allow new gas-fired generation to make up for weather impacts on their grid this summer?** This change has resulted in a growth of diesel-fueled generators as businesses and residents are in desperate need of reliable, dependable source of electricity. Two air quality districts, the South Coast and Bay Area, collectively are home to more than 23,000 backup generators (**20,000 are diesel-fueled**). **Combined these diesel-fueled and natural gas-fueled backup generators account for 12.2 GW or ~15% of California's electricity capacity.** Many businesses and mission critical services, such as hospitals and military bases, are bolstering their backup plans with microgrids made up of solar and storage combinations, with a large part of them including a backup generator, fired by natural gas or diesel, to deploy when circumstances require it. **So, the move to carbon free has suffered a major setback in California**.*

NextEra on target to reduce CO_2 emissions

*That **NextEra Energy Inc.** is the largest energy company in the United States? They are on target **to reduce CO_2 emissions 65% by the end of this year and bring online 4,300 MW of wind energy by the end of 2022.** NextEra has >14,000 MW of wind capacity already, and their subsidiary - Florida Power & Light (**FPL**) - already has >930 MW of utility scale solar with plans to **add an additional 12 new plants over the next year**.*

Japan has only 10 reactors with restart APPROVAL

*That **before the Fukushima accident, Japan was generating 30% of its electricity from nuclear power with plans to achieve 40% by 2017.** Today, they import ~90% of their energy requirements and Akira Amari, secretary-general of the Liberal Democratic Party (**LDP**) believes nuclear is needed to reach their carbon emission goals by 2030. **Japan has 33 nuclear power reactors classified as operable but only 10 have received clearance from their regulator to restart. Two reactors were restarted in August and October 2015 and 16 reactors are currently in the restart approval process.***

Another G2 GMD – Is a "Carrington Event" in Our Immediate Future?

"Blasts of charged particles from our sun

, are called coronal mass ejections, or solar storms. These storms can pack explosive energy. In 1989, such a storm caused the entire Canadian province of Quebec to go dark when a Canadian hydroelectric plant went off-line – which also affected ~100 US electrical utilities, connected by grid to the hydro-plant. In addition, GPS signals were lost for 10 minutes, with auroras seen as far south as Cuba - all it took, was a geoelectric surge of about 2 volts / kilometer."

You may have missed it, but we recently received another G2 Geomagnetic Storm that the National Weather Service classified as moderately strong.

A G2 storm can affect satellites in orbit, cause disruptions in the power grid, but this one also provided a magnificent aurora that was so powerful that it was visible as far south as New York and as far across the United States as Wisconsin and Washington state (***pictured above***).

However, as you know from previous articles we have presented about these storms, these coronal mass ejections can pack explosive energy, equal to thousands or even millions of nuclear bombs.

Scientists have warned that we are overdue for one of these blasts to result in the induction of electrical currents throughout the planet – called a GMD (***geomagnetic disturbance***).

We first learned about "geomagnetic storms" on September 1, 1859, when solar astronomer, Richard Carrington, witnessed sunspots that suddenly and briefly flashed brightly before they disappeared. Just before dawn, the very next day, auroras erupted over most of the Earth, as far south as the Caribbean and Hawaii, while the southern lights were seen as far north as Chile.

This event, named the "Carrington Event" not only produced a visible light show in areas where they had never appeared, it also caused electrical shock to telegraph operators, shooting sparks out of pylons, and causing paper fires.

Today, such an event could grind our technological infrastructure to a halt by overloading, disrupting, or knocking-out some of our modern technologies, like satellites and cellphones. A very real threat to our electrical infrastructure and power grid due to grounding and digitalization of equipment and components.

Since our electrical grids are grounded, they are susceptible to electrical currents induced from these storms, deep inside the Earth. Although the voltage is relatively low - just one or two volts - our power transmission lines extend for miles, and some of these lines are hundreds of miles long, so this voltage can add up and become significant. Just how significant is dependent on the size of the storm and the specific geology of an area or region. In the U.S. we are most vulnerable in the Midwest and Northeast.

In addition, the resultant voltage is more like direct current, which can result in transformer coil heat up - frying the coils – resulting in a loss of that specific transformer. And, when power transformers go down, the damage is rarely isolated, disruptions can ripple across the power grids and cause a major catastrophe.

Luckily, most geomagnetic storms are smaller in strength than the "Carrington Event". These smaller storms occur more often - every 100 years or so - five times more frequently than a 500-year storm like the "Carrington Event".

NASA says we have a 10% chance of a GMD event - similar to the "Carrington Event" – this decade. We just barely missed one in July 2012.

Today, should a "Carrington Event" occur, it is estimated, that it would inflict $2 trillion worth of damage and a recovery effort that could drag out for months or years – affecting the world.

GTTSi Employee – Mr. L.D. Holland

Meet GTTSi employee - Mr. L.D. Holland - Human Performance Management Consultant with over 42 years of experience within the electrical utility industry, including transmission & distribution, as well as the nuclear electrical generation side of the industry. Working on the generation side of the business he served as an I&C Technician, I&C Supervisor, ISS Plant Systems Instructor, Classroom & Simulator Instructor (***Operations and I&C***), and an INPO E&A and Training Accreditation Auditor.

L.D. is certified in Total Quality Management, PII Human Error Reduction, as well as an INPO Human Performance Fundamentals Instructor and Facilitator. He has done extensive research on various human performance issues and provided lectures on how leaders can adequately address the demographic challenges we face, in the workplace today – with traditionalists, baby-boomers, generation X'ers, and millennials. In addition to these qualifications and experiences, Mr. Holland is a pilot, pilot instructor, motorcycle & bicycle enthusiast, FATHER, and HUSBAND. L.D. recently rode with three of his teammates from Duke Energy across the Silver Comet Trail – 201 miles over three days (***L.D. is far right***).

Today, with over 20 years of service with GTTSi, we thank YOU for your contribution to our success and we are so proud to recognize YOU as one of our valued employees!

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COMPANY OR PERSON's NAME
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