



**May 2022
Newsletter**



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Decision Time for Michigan - Zero Emissions or Shutdown Palisades



“The BIG question for Governor Gretchen Whitmer – Achieve Zero Carbon Emissions by 2050 or Shutdown Palisades? If Palisades is shutdown the state will lose 5.8 million annual megawatt hours of zero carbon-emission electricity. That is equivalent to all of Michigan’s wind power capabilities, which took them 13 years to build, at a cost of more than \$5 billion. And only produces power 36% of the time – not very reliable – wouldn’t you agree? Doing this will eliminate ~15% of their zero carbon emissions. How can they make up this loss of power and zero-carbon emissions? The simple answer is ... they can’t! Maybe public sentiment can change the tide, because once these nuclear plants are shutdown, it is almost impossible to bring them back.”

Michigan is about to find out how devastating it is to lose the equivalent of all their wind-power capacity in the middle of a global energy crisis. Why, might you ask?

Because they plan to eliminate 5.8 million annual megawatt hours of zero carbon-emission by allowing the planned shutdown of the Palisades Nuclear Generating Station on Lake Michigan. This loss of power is equal to all of Michigan’s wind industry’s capabilities, which took them 13 years to build, at a cost of more than \$5 billion.

Michigan will be relying on their wind and solar generation to pick up the slack, but they only produce energy 36% of the time for wind, and only 17% of the time for solar.

This raises a very BIG question for Governor Gretchen Whitmer – How can she take the state to zero emissions by 2050? Simply answered – she cannot reach zero emissions without nuclear. Without nuclear energy, Michigan will see no appreciable reduction in their carbon emissions.

Few are asking this very question, and she is not alone; other states find themselves in similar circumstances.

This 811 MW nuclear power plant is planned for shutdown in May – almost 10 years ahead of its license expiration date.

Palisades has provided

resilient, reliable, zero carbon-emission electricity since 1973 with 6.8 million megawatt hours of energy per year. Far above what the 1,400-megawatt hours that wind turbines can provide. In fact, Palisades generated 7 million megawatt hours in 2021.

Other states are retiring nuclear plants without a viable replacement - like Illinois, which struggled late last year to delay the impending closure of Byron and Dresden plants, and California plans to shutdown by 2025.

These moves make little sense if the TRUE GOAL is to reduce greenhouse emissions. Just like wind and solar, nuclear produces none of the emissions associated with climate change: no nitrous oxide, sulfur oxide, or carbon dioxide.

Unlike wind and solar, nuclear receives a small taxpayer subsidy, while solar and wind is much greater. If all subsidies disappeared, nuclear would survive - wind and solar would not. These subsidies are currently scheduled to subside by the end of this year.

Nuclear provides 26% of Michigan’s electricity and if we consider only “green” energy, then nuclear’s contribution is even more significant – as Michigan has two other nuclear power plants - Fermi, & DC Cook. All three plants together provide 82% of the state’s zero carbon-

emissions electricity. Only 18% comes from wind, solar and incidental renewables, which can’t make up the energy loss that will occur with the shutdown of Palisades.

To replace a single nuclear plant with wind power requires an area of ~800 square miles (**75% of Rhode Island**). Although Michigan is a good-sized state, it’s already approaching its capacity to accommodate wind turbine development.

However, new nuclear capacity is unlikely due to a tangle of energy subsidies that have distorted the electricity market - where the lowest-price energy bids set the market price, regardless of whether that energy can actually be delivered. Because of these guaranteed subsidy streams, wind and solar producers can lowball bids, even though they know they will be unable to deliver the energy needed. Nuclear plants then have to leave the market because their owners can’t afford to continue producing at slim or negative margins. Uninterrupted, this trend can only end with your lights going out.

Hope public sentiment can change the tide, because once these nuclear plants are shutdown, it is almost impossible to bring them back.

Power Companies Stand to Lose Talent in the “War for Green Jobs”



“The convergence of renewables, power, and technology around clean smart grids means that skills are increasingly transferrable between these three sectors. The cross-sector war for green energy talent means that this is now an employee’s market and employees are increasingly empowered to pick employers based on their personal values, ESG, as well as their promotional opportunities. Engineering is the top transferrable skill”

A report by workforce solutions provider Airswift and Energy Jobline found that renewables is the first choice for utility workers looking to change jobs. In fact, they found that 86% of power workers would consider leaving their current job for another energy industry job within the next three years.

Janette Marx, Chief Executive Officer at Airswift, says ... The convergence of renewables, power, and technology around clean smart grids means that skills are increasingly transferrable between these three sectors. The cross-sector war for green energy talent means that this is now an employee’s market and employees are increasingly empowered to pick employers based on their personal values as well as promotional opportunities. Yet the role of clean power and smart grid innovations in decarbonizing economies means the sector is perfectly poised to capture an innovative, belief-driven generation.

After a survey of 10,000 energy professionals and hiring managers of 144 different nationalities and

spread across 161 countries, the following was determined:

- 86% of professionals would consider relocating for work, but only 25% receive relocation support.
- 42% of professionals reported a pay increase over the past year.
- 55% of those open to switching sectors would move to renewables and 38% would leave the energy industry for technology.
- 44% of those surveyed believed that advances in engineering technologies ranks as the most important opportunity facing the sector over the next 3 years.
- Hiring managers say that Engineering is the top transferrable technical skill desired and 61% of those surveyed possess this background and experience.
- Power firms received the lowest average rating for environmental performance in the energy industry.
- 29% of power professionals say their organization has not adapted to the clean energy transition, indicating that failure to decarbonize our grids now poses a major risk to talent retention.
- The energy transition is listed as the 2nd greatest challenge facing the energy sector after COVID-19
- 45% say their employers have adapted to the energy transition, with 88% welcoming the change, indicating that transitioning to clean power boosts employee satisfaction and retention.
- Three-quarters are considering leaving energy over the next three years with most drawn to the technology industry.
- Europe remains the most attractive destination for international transfers at 33%, reflecting the region’s world-leading role in the global energy transition.
- 86% of those surveyed say ESG is a factor in whether they will stay or leave an organization.

(Environmental, Social, and Corporate Governance abbreviated as ESG is an approach to evaluating the extent to which a corporation works on behalf of social goals that go beyond the role of a corporation to maximize profits on behalf of the corporation's shareholders.)



Supreme Court Rules - 2020 Clean Water Act Still in Effect !



“The Clean Water Act (CWA) raises concerns once again. The Supreme Court has ruled the 2020 CWA will remain in effect, until final disposition.”

The Supreme Court in a 5-4 split have temporarily revived the 2020 Clean Water Act (CWA) based on a lower court order (U.S. District Court for the Northern District of California), which had vacated and remanded the Certification Rule back to the EPA without first

addressing the merits of the rule. The Supreme Court’s stay of the Certification Rule will remain in effect pending final disposition of the case.

Prior to the 2020 CWA, Section 401 ruled that a federal agency could not issue a license or permit to conduct any activity that could result in any discharge into navigable waters unless the affected state or tribe certified that the discharge was complied with the Clean Water Act and state law, or waived certification.

After much debate over what constituted navigable waters, complaints from

the fossil fuel industry that state officials had used the permitting process to stop new energy projects, and complaints from Republicans in Congress the Trump administration curtailed that review power and made this revision to Section 401 to fast-track energy projects such as oil and natural gas pipelines.

The Biden administration said it intends to rewrite the rule and that work on the revision has already begun. However, they do not expect a final rule until the spring of 2023. Until then, the 2020 CWA rule will remain in effect.

Enforcement of the CSAPR to Begin in 2023 – Estimated Cost \$1.3B



“The EPA proposes to begin enforcement of the CSAPR to include electric generating units across 25 states and the emission standards for certain industrial sources across 23 states. The cost - estimated at \$1.3B but the benefit at \$9.3B.”

Beginning in 2023 the EPA (*Environmental Protection Agency*) proposes to enforce the Cross-State Air Pollution Rule (CSAPR) NOX Ozone Season Group 3 Trading Program requirements to include electric generating units in 25 states. The EPA said, this will help states fully resolve their “good neighbor” obligations for the 2015 Ozone National Ambient Air Quality Standards (NAAQS) ... Alabama, Arkansas, California, Delaware,

Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming would be the states affected.

Beginning in 2026, the EPA proposes to enforce emissions standards for certain industrial sources in 23 states that have a “significant impact” on downwind air quality ... Alabama, Arkansas, California, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Tennessee, Texas, Utah, West

Virginia, Wisconsin, and Wyoming would be the states affected.

The cost of achieving these reductions would be roughly \$1.3 billion (*in today’s dollars*), EPA said, and offer at least \$9.3 billion in benefits. They project it would prevent around 1,000 premature deaths and avoid more than 2,000 hospital and emergency room visits, 1.3 million cases of asthma symptoms, and 470,000 school absence days. It said reducing ozone levels also would improve visibility in national and state parks and increase protection for sensitive ecosystems, coastal waters, estuaries, and forests.

Japan Buys Stake in NuScale – Fluor Still Majority Owner



“In April, JNI (Japan NuScale Innovation) and Japan Bank for International Corp (JBIC) bought \$110 million in NuScale Power equity from Fluor Corp. But Fluor remains majority owner and will continue to provide NuScale with engineering, procurement, project management, and construction of its energy projects. NuScale’s design does not rely on powered water pumps or circulatory equipment. The company claims it can shut down and continue cooling itself indefinitely during most accidents.”

The idea for NuScale began in 2000, based on research funded by the US Department of Energy (DOE) and conducted by Oregon State University (OSU), Idaho National Laboratory (INL), and a few other colleges. But their research grant ended in 2003, so a group of scientists at OSU decided to continue and built a test lab at one-third the actual scale.

In 2007, they exchanged some patents, they had developed along the way, for a small equity in the company and NuScale was founded.

NuScale began seeking NRC (Nuclear Regulatory Commission) certification in February 2008.

By 2011, NuScale had raised \$35 million in financing and had 100 employees. In October, Fluor Corp. acquired a majority interest in the company for \$3.5 million and promised another \$30 million in working capital, and in a separate agreement Fluor gained rights to construct NuScale-based power plants.

In March 2012, NuScale signed an agreement with the Department of Energy (DOE), allowing NuScale and two partners to build and operate a NuScale-based nuclear power plant at the SRS (Savannah River Site). In April 2012, Energy Northwest said it didn't have any immediate plans to construct a nuclear power plant but

identified NuScale as the best available option. In December 2012, co-founder, and CEO Paul G. Lorenzini was succeeded by the current CEO John Hopkins.

In July 2013, NuScale announced an effort to study and demonstrate NuScale reactors in the Western United States, called Program WIN (Western Initiative for Nuclear), with plans to build their first NuScale-based power plant in the western United States by 2024. In December 2013, NuScale won up to \$226 million in "cost-sharing" funding to share the expense of pursuing government approval, through the SMR Licensing Technical Support program.

This was followed by an agreement in May 2014, for up to \$217 million in funding over a five-year period, whereby the DOE would match private funding. In November 2014, NuScale announced it was building an SMR plant in Idaho. The plant is for the Carbon Free Power Project with Utah Associated Municipal Power Systems (UAMPS).

In January 2017, they submitted their NuScale design to the NRC.

In January 2018, the NRC agreed that the NuScale SMR does not need back-up power.

In August 2020, the NRC issued a final safety evaluation report for NuScale's small modular

reactor design, certifying the design as having met the NRC's safety requirements. NuScale became the first SMR to receive NRC approval for its design.

In 2021, NuScale received investments from JGC Corp. and IHI Corp., together forming JNI (Japan NuScale Innovation) making JNI the 2nd largest investor (~9 percent). In November 2021, NuScale announced its intent to build with Nuclearelectrica its first SMR outside the US, in Romania, as early as 2028. In December 2021, NuScale Power and Spring Valley Acquisition Corp. reached a merger agreement with an estimated enterprise value of \$1.9 billion. NuScale would receive up to \$413 million of gross cash proceeds, including a \$181 million private investment. Following this merger, Fluor Corp. was projected to be a 60% owner of the company.

In February 2022, NuScale signed a contract with KGHM to construct their SMR in Poland by 2029. In April, JNI and Japan Bank for International Corp. (JBIC) bought \$110 million in NuScale Power equity from Fluor Corp. But Fluor remained majority owner and will continue to provide NuScale with engineering, procurement, project management, and construction of its energy projects.

Did You Know ?



“Meet Peggy Keane, Vice President of Construction and Business Services for PSEG. She said construction was always in her blood. After studying engineering in college, she began her career with Proctor & Gamble, building equipment and processes for their products. Later she worked with General Foods in a similar capacity, had her own company, before joining PSEG. Beginning at PSEG in their Gas Operations, her talents led her to Project Management where she managed the FEMA-funded storm hardening program that ran from 2014 until 2020. That success led to her appointment as Vice President where she leads the Projects and Construction Team.”



GE gas turbines power Edra Energy’s combined cycle plant in Malaysia

That **GE 9HA.02 gas turbines are now powering Edra Energy’s combined cycle plant in Alor Gajah, Malacca, Malaysia?** It is the largest combined cycle power plant in Malaysia – adding **more than 2.2 GW** of electricity to their grid, **representing ~10% of their electricity demand.** The new plant includes three generating blocks capable of generating over 745 MW per block. Each block includes a GE 9HA.02 gas turbine, a STF-D650 steam turbine, a W88 generator and a Heat Recovery Steam Generator (HRSG).

U.S. and other nations will increase liquified natural gas (LNG) exports to Europe by 15 billion cubic meters this year

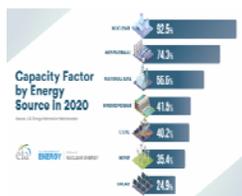


That the **United States and the European Union announced a new partnership to reduce Europe’s reliance on Russian energy - the start of a years-long initiative to further isolate Moscow after its invasion of the Ukraine?** Under this plan, the **U.S. and other nations will increase liquified natural gas (LNG) exports to Europe by 15 billion cubic meters this year,** with even larger shipments planned for the future. Most U.S. shipments of LNG are already going to Europe, according to the Center for Liquefied Natural Gas. Getting more liquefied natural gas to Europe could be difficult, even though the U.S. has been dramatically increasing its exports in recent years. **Many of our export facilities are operating at full capacity, and most new terminals are still in the planning stages. Although much of the U.S. LNG is already contracted out to buyers, there are limited opportunities to shift some of its destination.**



West Virginia battery plant in 2022 - Secretary Granholm announced \$5M training initiative for battery workers

That energy startup **SPARKZ is partnering with the United Mine Workers of America (UMWA) to recruit and train dislocated miners to be the first production workers at the electric battery factory to be built in West Virginia in 2022?** Energy Secretary Jennifer Mulhern Granholm and Interior Secretary Deb Haaland joined WV Senator, Joe Manchin, and UMWA representatives at Marshall University to discuss workforce development opportunities, where **Granholm announced a \$5 million training initiative - the first in the nation to focus on battery workers.** These funds will be split among five U.S. sites, one of which will be in West Virginia. **Secretary Granholm said these steps are necessary to ensure that the U.S. is “energy independent” and not relying on countries like China for our supplies.**



U.S. solar capacity is now over 120 GW’s

That **U.S. installed solar capacity is greater than 120 GW’s (gigawatts),** 19.2 GW’s were installed in 2020 and 23.6 GW’s in 2021. **This is enough capacity to power 23.3 million homes if this power was available 24/7, but it is not.** On average, Solar’s capacity factor is only 25%, Wind is ~35%, but Nuclear is >90% and has maintained a 90% capacity factor for over a decade. **Renewables will need energy storage to improve their capacity factors, but this is a long way off and very expensive.** The average cost for a home battery energy storage system is \$6,000 and the average cost for the solar electric system is \$18,500. If your average electricity bill is like mine – about \$140/month – it will take you 14.5 years to break even.

No More Shutdowns – Keep Our Nuclear Plants Operating !



“Many believe the climate crisis has exploded ahead of schedule, not as a distant warning but in the result of actual fires, floods, and rise of the global sea-level. But our nuclear plants have proven they are solid climate benefactors, faithfully churning out resilient, reliable electricity without combusting carbon fuels, even during extreme weather events. Sentiment is turning ... and the nation’s nuclear fleet is starting to receive the attention it so rightly deserves – providing reliable, resilient, zero-carbon emission electricity, with both climate and pocketbook benefits.”

Sentiment is turning ... after 43 years of safe reliable electricity production, since Three Mile Island, the nation’s nuclear plants have ridden out the post–Three Mile Island cancellations and post-Fukushima shutdowns. During this time, we have gone from 106 operating reactors to only 93 but those remaining are starting to receive the attention they so rightly deserve – providing reliable, resilient, zero-carbon emission electricity over 95% of the time - operating under the radar, during extreme weather conditions, with their climate and pocketbook benefits taken for granted.

Electricity rates in many areas are soaring but not due to nuclear plants operating. For example, let’s look at New York City where rates have been rising, long before Russia’s assault on the Ukraine. The rates are being blamed on the cost of natural gas, but do you remember when New York shutdown one of its nuclear stations, Indian Point. This caused Con-Edison to rely on natural gas and other fossil-fuel plants to replace that loss of power, resulting in increased costs due to spiraling natural gas prices.

Although wind and solar costs have been falling, their pace in producing power has fallen way short of expectations, belying all the promises made by “safe energy”

advocates who helped engineer Indian Point’s closure.

The emission goals set by various state legislatures are bearing down upon us. To meet them we need every green-energy addition to replace the equivalent fossil fuel generators, but instead – just as in the loss of Indian Point - more reliance has been placed on fossil fuel generators, so the net result has been an increase in carbon emissions. Recently, “greenies” have boasted about the increase in leases for ocean wind farms off Long Island and New Jersey. But to make up for Indian Point’s energy output will require about half or more of the hoped-for 7,000 megawatts of offshore wind, badly undermining the legislative commitment to rid the New York grid of carbon emissions by 2040.

In California, we have a similar dilemma, Diablo Canyon’s two reactors have provided 2,200 megawatts of resilient, reliable zero-carbon emissions for decades. Shutting them down by 2025 will require much more renewable capacity (~ 7,000 megawatts) due to their capacity factor which is much less than the 95% that Diablo Canyon provides. Thus, once again, a LOSS in the reduction of carbon emissions – instead, they will INCREASE until these 2,200 megawatts are fully replaced by some other

zero-carbon emission sources, and that is far away. 50% of California’s electricity still comes from fossil-fuel sources, although it is 12% less than it was in 2015. The reduction in carbon emissions is attributed to the increase in solar, amounting to more than 15 billion kWh annually. However, shutting down Diablo Canyon takes away 17 billion kWh annually of carbon-free emissions. Therefore, the net result is once again an INCREASE in carbon emissions.

Many believe the climate crisis has exploded, way ahead of schedule - not as a distant warning but in the result of actual fires, floods, and rise of the global sea-level. But our operating nuclear plants have proved they are solid climate benefactors, faithfully churning out resilient, reliable electricity without combusting carbon fuels, even during extreme weather events.

No one can deny that letting existing reactors like Diablo Canyon remain in service keeps fossil fuels in the ground and their carbon emissions out of our atmosphere. Let’s keep them operating as we transition to a renewable future, if this approach is not realized - carbon-emissions will INCREASE and “rolling blackouts and brownouts” will become the NORM.



GTTSi Job Board Update

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- **ITAAC Engineer (all disciplines needed)**
- **Quality Engineer**
- **Quality Control Inspector (Mechanical or Electrical I&C Level II or III)**
- **Cost Estimator**
- **Substation Engineering Lead**
- **Systems Analyst**
- **Business Analyst, Associate**
- **Concerns / Compliance Coordinator**
- **Project Engineer**

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