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Contention One is Renewables

The renewable market is thriving

DiGangi 25 (Diana DiGangi: Reporter for Utility Dive. 1/21/25, "2025 Renewable Energy Outlook: Full speed ahead as second Trump administration begins", Utility Dive, https://www.utilitydive.com/news/2025-outlook-renewable-energy-inflation-reduction-act-trump-administration/737234/ //. DOA: 3/25/25)JDE

The renewables industry begins 2025 with the Inflation Reduction Act continuing to spur record investment, and spiking load growth providing new opportunities for deployment. At the same time, interconnection queues across the country remain clogged, siting, permitting, financial and other challenges continue, and industry critic Donald Trump just began his second term as president. "It's an interesting moment, because there is this really rapid change, and yet we're stuck in some really key ways," said Heather O'Neill, president and CEO of Advanced Energy United. "The interconnection queue is one really clear example where, yes, there's some progress — FERC's putting out reform measures — and yet we're not unleashing the full promise and the economic opportunity and activity that we could." **After decades of flat load growth, U.S. electricity demand could rise 128 GW over the next five years, according to a report last month from Grid Strategies**. At the same time, the number of new transmission interconnection requests has risen by 300% to 500% over the last decade, with 2.5 TW of clean energy and storage capacity currently waiting to connect to the grid, said an October report from the Department of Energy. However, O'Neill said, the "**the macro trends are incredibly positive … We are in the middle of an energy transformation**." She attributed some of her optimism to the scale of investment and growth that the industry has been seeing. **The energy storage sector is especially dynamic right** now, O'Neill said: "A few years ago, [there was] very little in the way of storage capacity showing up, but with so much innovation in the technology, the cost curves are coming down. When we think about how to manage load, storage plays a key role in that." Global energy storage installations boomed 76% in 2024 and are projected to continue that streak in 2025, according to a November report from BloombergNEF, but BNEF noted that growth may be impacted by "uncertainties stemming from the new Trump administration." **Trump has spoken out against electric vehicles and said he will "rescind all unspent funds under the misnamed Inflation Reduction Act."** Congress is expected to try to claw back EV tax credits from the IRA, which could impact the battery industry. Trump has also said he would end offshore wind "on day one" and embraced oil and gas generation, but **vowed last month to expedite federal permits and environmental reviews for construction projects that represent an investment of $1 billion or more — a move that could benefit clean energy.** Felisa Sanchez, a partner with law firm K&L Gates' maritime and finance practice groups, said that **Trump's goal to end offshore wind may come into conflict with his goal of boosting the U.S. economy and its domestic manufacturing. "It's hard to say 'we're going to end offshore wind' when you're also impacting a vast supply chain that has already been going for the last few years that has been implemented** — when ports have been developed, and vessels have started to either be under construction or have come out of the yard ready to work in offshore wind," she said. **The need to meet load growth on the electric side is not going away. And any administration – Republican, independent, Democratic – foremost in their mind is going to be a strong resilient economy. That's going to be dependent upon a best-in-class electric distribution grid.** Paul DeCotis Senior partner and head of East Coast energy and utilities at West Monroe John Northington, a government affairs advisor and a member of K&L Gates' public policy and law practice group, said he anticipates that the **offshore wind industry may adapt to the new administration by shifting away from "'steel in water is good for the environment' as the main message." "Maybe for the next four years, it's that steel in water is good for jobs, it's money, it's good for America,**" he said. "Talking about the business benefits, rather than environmental benefits, could be a change in trend for some of these companies." When speaking to Utility Dive in December, Northington said he was also hopeful about the bipartisan Energy Permitting Reform Act of 2024, sponsored by Sen. Joe Manchin, I-W.Va., and Sen. John Barrasso, R-Wyo. — but the bill was not included in the continuing resolution passed later that month, "taking permitting off the table for this Congress," said Manchin, who retired in early January. New demands on the grid Regardless of how Trump's second term shapes the U.S. generation mix, his administration will be dealing with an anticipated 3% annual average load growth over the next five years — a level which hasn't been seen since the 1980s, according

to a December report from Grid Strategies. "The need to meet load growth on the electric side is not going away. And any administration — Republican, independent, Democratic — foremost in their mind is going to be a strong resilient economy," said Paul DeCotis, a senior partner and head of East Coast energy and utilities at West Monroe. "That's going to be dependent upon a best-in-class electric distribution grid." Surging load growth is driven largely by data center demand, which a December report from Lawrence Berkeley National Laboratory found has tripled over the past decade and is projected to double or triple again by 2028. The increase in demand is also the result of industry electrification and growth in domestic manufacturing. That growth "means continued capital investment in the [energy] industry, regardless of the administration," DeCotis said. **"I don't think any administration is going to want to come in and all of a sudden see brownouts and blackouts and not enough capacity to meet demand, or have to stall demand and the job growth that goes with it, because they can't meet energy needs**." O'Neill said she believes that **states will also continue to drive the clean energy transition forward, as they're where "energy policies happen …. where the investments become real**." State governors and commissioners "want manufacturing in their state," she said. "They want data centers in their state. The siting reform conversation is one that I think is not a partisan conversation. It's: how do we help unlock some of this desired economic activity? For us, the siting and building issues will be something that we're going to work on in the states, regardless of the landscape in D.C." **The projects that are being facilitated through [the IRA] are not isolated in blue states.** For example, we're doing projects all over the country and seeing projects work in states like Ohio and Pennsylvania that didn't used to work. Dan Smith Vice president of markets at DSD Renewables In addition to states and utilities, companies like Microsoft, Amazon and Meta are also helping to drive the demand for clean energy — investing billions in renewable energy deployment in addition to seeking nuclear and natural gas generation to handle load from their data centers. Molly Jerrard, head of demand response at Enel North America, said she expects that in 2025, "significant load growth .... will challenge our grid's flexibility and put the reliability of local systems to the test." "**Combine this with aging infrastructure, congestion, and the uptick in climate-driven grid stress, utilities and grid operators will need to put a bigger focus on adoption of demand response programs and distributed energy resources to address these challenges and increase grid stability**," Jerrard said. However, she said, "inconsistent data access standards" from utilities continue to limit the scalability of virtual power plants, a potent demand response solution. O'Neill is excited about VPPs, she said, as she sees "a ton of innovation" flowing into the sector and expanding the ways that VPPs can offer grid flexibility. "We're seeing virtual power plants across different regions of the country — whether it's coastal or Texas — where you've got utilities and commissions really putting virtual power plants to the test," she said. "They're managing the load, they're shaving peak loads, and they don't have to build as much [generation]."

Trump will not decrease renewables

Chu and Hurst 25 (Daniel Chu, CFA: Portfolio Manager at ClearBridge Investments. Shane Hurst, CFA: Portfolio Manager at ClearBridge Investments. 2/28/25, "Renewables under Trump: Likely better than expected", Franklin Templeton, https://www.franklinresources.com/articles/2025/clearbridge-investments/renewables-under-trump-likely-better-than-expected // DOA: 3/25/25)JDE

Key takeaways: **While the new Trump administration creates elevated risk as it shifts clean energy policy, our view is that any changes to the Inflation Reduction Act (IRA)**—which we expect to be **less than the market anticipates—will ultimately have a muted impact** on the short- and long-term renewables outlook. Given Republican support for the IRA**, the slim majority in Congress will make it difficult for Trump to enact meaningful cuts. Demand for renewable energy will continue to be strong regardless of policy changes due to factors such as artificial intelligence (AI)**, as we think the market overlooks the changing electricity demand for renewable energy. Muted impact on short- and long-term renewables outlook It has been an active first few weeks in office for US President Donald Trump, and true to expectations, policy uncertainty remains high. Infrastructure investors have been watching closely as, while there are some expected policy tailwinds, concern has grown over potential headwinds from the new administration, particularly for renewable energy utilities. **While we acknowledge elevated risk and volatility as Trump shifts clean energy policy, our view is that any changes to the IRA—which we expect to be less than the market anticipates—will ultimately have a muted impact on the short- and long-term renewables outloo**k. As such, we remain comfortable with our existing contracted renewables exposure. Onshore wind and solar, for example, are particularly leveraged to **production tax credit (PTC) and investment tax credit (ITC) subsidies**. The funding package under the IRA extends across multiple technologies and applications, with onshore wind and solar tax credits being only a portion of the total package. **While there have been significant headlines about Trump rolling back subsidies, there has been no substantial commentary regarding the potential**

elimination of the PTCs and ITCs. So far, Trump's focus has been on **curtailing subsidies outside of the PTC and ITCs, such as electric vehicles (EV) tax credits** and, more recently, reviewing loans from the Department of Energy. We believe this is important signaling regarding the priorities of the Trump administration. Offshore wind is the only area in contracted renewables we believe is at significant risk. This is a clear distinction from onshore wind and solar, as the administration has halted the issuance of any new offshore wind leases following Trump's pre-election comments opposing it (which requires more extensive federal government involvement). Tax credits may moderate to historical norms, yet remain growth-friendly Do we think Trump will leave the PTC and ITC credits alone? These credits could be rolled back somewhat, as the new administration looks for sources of funds to extend the Tax Cuts and Jobs Act of 2017 and other policy priorities. However, **we think the cuts will be moderate and not impact the long-term outlook for key renewable players.** The duration of the PTC and ITC subsidies may be reduced from their current 10+ year duration to something shorter, such as five years. Recall that PTC and ITCs existed prior to the IRA; a moderation back to older norms is a reasonable assumption. However, we think it still represents an attractive backdrop to incentivize investments. Onshore wind and solar projects (with the PTC and ITC framework) worked perfectly well under Trump in his first term, and we think it will be the same in his second term. In addition, **removal of the PTC and ITC provisions would need to be approved by Congress (Trump cannot do this under executive order), where many Republican members are key beneficiaries of these tax credits to their states. In fact, last year 18 House Republicans signed a letter of support for the IRA, highlighting some of the general economic benefits and jobs to many Republican states.** Given this, the slim majority in Congress will make it difficult for Trump to enact meaningful cuts to the IRA. It is worth noting that **one of the largest renewable energy companies in the world, has expressed confidence in its ability to continue to meet development targets even under a more draconian scenario.** As risk around IRA repeal has been discussed extensively over the last 18 months, companies have been able to adjust accordingly. **Lastly, demand for renewable energy will continue to be strong regardless of policy outcomes. We believe the market overlooks the growing demand for electricity from renewable sources** (Exhibits 1 and 2), much of which is being driven by the increasing electricity needs of the large language models driving AI adoption. Even in a scenario where 50% of electricity demand is met through natural gas and nuclear power, renewables growth will need to accelerate meaningfully; by some estimates, we would see renewables' compound annual growth rate almost doubling.

Substantial investment in nuclear energy would trade off with renewables

Hockenos 22 (Paul Hockenos is a Berlin-based journalist and author of Berlin Calling: A Story of Anarchy, Music, the Wall and the Birth of the New Berlin, 11/24/22, "Why Nuclear Power and Renewables Don't Mix" Energy Transition, https://energytransition.org/2022/11/why-nuclear-power-and-renewables-dont-mix/#:~:text=%E2%80%9CNuclear%20is%20inherently%20inflexible%2C%20and,of%20nuclear%20actively%20hinders%20both.%E2%80%9D, DOA: 3/26/25) ST

But **Couture**, a Canadian national who has lived and worked in Berlin for over a decade, **takes issue with the contention that nuclear segues well with clean energy**, even the smaller SMRs. "**Nuclear power and variable renewables like solar and wind are like oil and water**. **They don't mix,** at least not well," he says. Even the SMRs that the IAEA touts, says Couture, do not ramp up and down easily. "**Nuclear is** inherently **inflexible**, and **to accommodate** the **variability** of **wind and solar output**, what **we** ultimately **need** is both **flexible** sources of **supply, and** greater flexibility of **demand**. **The presence of nuclear actively hinders both."** Couture explains **that they compete against each other rather than working together**. **Nuclear**, he argues, "**wants to operate as much as possible**, while **solar and wind want to be dispatched all the time, for the simple reason that they have a near-zero marginal cost and outprice everything else** on the market. **Put those two together and you have the following situation: as soon as you reach modest levels of variable renewables in the mix**, one of two things starts happening: **either solar and wind start pushing out the nuclear, or nuclear starts pushing out the solar and wind. Like oil and water**," he says. And **Couture is not alone in his analysis**. A University of **Sussex Business School study**

concludes that **nuclear and renewable energy programs do not tend to co-exist well** together **in low-carbon energy systems but instead crowd each other out and limit effectiveness.**

Lovins 22 (Amory Bloch Lovins is an American writer, physicist, and former chairman/chief scientist of the Rocky Mountain Institute. He has written on energy policy and related areas for four decades. April 12, 2022 "Nuclear energy should not be part of the global solution to climate change" Utility Drive, https://www.utilitydive.com/news/nuclear-energy-should-not-be-part-of-the-global-solution-to-climate-change/620392/, DOA: 4/2/25) LLO

The "best analysis" behind the opinion piece's assertion that renewables plus nuclear "can create the most cost-effective carbon-free energy system" adds nuclear only if it's very cheap (assuming learning curves not observed for modern reactors, let alone for types of reactors that do not exist). It also assumes that renewables and storage are far costlier than BNEF's empirical data show (unable to follow observed learning curves), and excludes most grid-flexibility resources. Diverse peer-reviewed studies without such artificial constraints — 56 of which were published by April 2021, then many more, e.g., here, here, here and here — better match empirical market choices and need no nuclear power to minimize cost or carbon. Competing climate solutions In over 24,000 actual market projects, **new unsubsidized renewables make electricity 5–13 times cheaper than nuclear newbuild** according to BNEF; merchant bank Lazard analysis finds 3–8 times. Per dollar, renewables therefore provide 3–13 times more kWh and can displace 3–13 times more fossil-fueled generation. Still-cheaper efficiency is even more climate-effective. As my 2019 nuclear-and-climate analysis and its summaries here and here noted, **grid integration costs matter too when comparing electrical resources — but not much. They'd need to be about 2–12 times renewables' levelized cost of energy (LCOE) for nuclear to rival renewables, but the opposite is true.** Solar and windpower integration costs are at worst comparable to their LCOE. In the U.K., these grid integration costs are modest, and U.S. utilities find they're manyfold below renewables' LCOE even at 85% wind share, so adding them into the comparison can't flip the outcome as the opinion piece claims. BNEF finds that even a flat load is now most cheaply by variable renewables, plus backup that's also carbon-free if it's demand-side, renewable, or storage. **That's why the International Energy Agency forecasts renewables to provide at least 95% of the world's new capacity, or around 305 GW/year, through 2026.** Moreover**, including grid integration (or similarly small grid expansion) costs would probably increase nuclear's cost disadvantage, because big thermal plants typically incur severalfold higher integration costs than wind or solar farms**, consistent with longstanding Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory findings. **That's because those renewables' outages are far smaller, slower, shorter and more predictable — often more predictable than demand itself. Renewables largely avoid big thermal plants' high intermittency (forced-outage) costs for reserve margin, spinning reserve and cycling.** Those costs too must be counted and compared. **Adding "complementary" nuclear power doesn't help but harms variable renewables. Its cycling limitations and high capital cost require maximum runtime, but nearly-zero-operating-cost renewables idle reactors by dispatching whenever available.** Reactors can't have both a high and a low capacity factor — pick one. Moreover, **cycling reactors spoils their economics via lifetime, maintenance and efficiency penalties, and spreading high fixed costs over less output. The same holds true for proposed (but often rejected long ago) Small Modular Reactors, which bring greater economic and use-case challenges, novel safety** and proliferation issues that are now making the Department of Energy undercut the mission of the Department of Defense, and lesser carbon savings achieved later. **Thus nuclear newbuild, already grossly uncompetitive when renewables generate a minor share, gets more so as they grow.** It's also slower, so it cut global 2010–20 carbon emissions fivefold less than renewables did. As President Emmanuel Macron of France just said, "We need to massively develop renewable energies because it is the only way to meet our immediate electricity needs, since it takes 15 years to build a nuclear reactor." **Most existing reactors cost more just to operate than replacing them with similarly carbon-free efficiency and renewables.** The opinion piece urges compounding that misallocation with billions more in subsidies to keep uneconomic reactors running and save carbon. **But letting them exit the market instead would open up demand and grid capacity for cheaper carbon-free competitors to contest, saving more carbon starting a year or two later as efficiency and renewables overtake and reverse transient gas substitution. Duct-taping new nuclear subsidies to more-popular renewables diverts more capital to less climate-effective nuclear projects**, saving less carbon. And **nuclear phaseouts work. In 2010–20, Japan, despite suppressing windpower, replaced with renewables and efficiency its entire lost 30%-nuclear**

output, displacing the 21 zombie reactors sidelined for the past 10–14 years. Germany (30% nuclear in 2000) meanwhile offset its nuclear closures with renewables and efficiency while slashing coal generation 64% and lignite 37%. It now plans to triple its pace of renewable expansion to get off fossil fuels even faster — and achieve even quicker efficiency gains to displace Russian gas "at Tesla speed." Balancing a renewably powered grid Decarbonization without "firm" generators looks "extremely costly" only if most grid-flexibility solutions are excluded. At least ten carbon-free methods (the International Renewable Energy Agency found 30) — not just the costliest one, giant batteries — can keep grids reliable as they become renewable. In rough order of increasing cost, they are: Electric end-use efficiency (or negawatts) could quadruple in the U.S. by 2050, costing a tenth today's average retail price. Lower energy intensity provided 77% of global 2014–16 decarbonization, cut 1975–2021 U.S. primary energy use 60%, and can do far more, especially with integrative design and rethinking supposedly "harder-to-abate" sectors. Not comparing or competing efficiency overbuys supply and complicates grid balancing. Flexible demand that shifts certain loads' timing without inconveniencing customers can exceed the demonstrated residential peak load savings. For example, eight kinds of "flexiwatts" could eliminate the Texas grid's steep evening load ramp as people come home and turn stuff on just as solar power fades — and could also cut nonrenewable capacity 24% and daily summer load range about 42%, make renewables 26% more valuable, and pay back in about five months. Competing such load-shaving and -shifting building-efficiency retrofits against electricity storage can eliminate most long-duration storage needs (small anyhow) in four key U.S. regions, cutting investment by at least an order of magnitude. More-accurate forecasting already makes East Danish windpower dispatchable in day-ahead hourly markets, just as offshore windpower is stabilizing the German grid. Renewable diversification by type and location captures valuable complementarity; just combining anticorrelated sites can double U.S. windbelt productivity. **Dispatchable renewables — virtually all renewables except photovoltaics and wind (subject to #3) — and industrial cogeneration can directly balance PV and wind variations.** Storing heat or coolth, even in existing buildings' fabric, is a vast, low-cost grid-balancer, as NREL found. Behind-the-meter batteries (often cost-effective even in 2014) will soon be joined by terawatts of profitable storage opportunities in parked bidirectionally charging electric vehicles. Just EVs plus ice-storage air conditioning could enable 100% renewable power for ERCOT in 2050, with excellent economics and no bulk storage. Pumped storage worldwide totaled 158 GW in 2019 with another 53 GW under construction and 226 GW under consideration, plus compressed air, gravity, and other emergent non-chemical methods. Readily storable power-to-X "green molecules" (hydrogen or ammonia) can run fuel cells or existing gas plants in any desired quantity, and have reportedly reached $2.7/kgH2 in China. **Grid-scale battery storage added 5.2 GW in 2020**, rivaling gross nuclear build, then far outpaced it, with 358 GW / 1 TWh to be added by 2030. It's blackstartable, can stabilize grids better than rotating machines (as renewables can too), and has profitably run a GW-scale 96%-renewable grid (or smaller at 100%) for nearly a week.

Renewable industry would be harmed immediately

Haywood et al 23 (Luke Haywood is head of climate and energy at the European Environmental Bureau (EEB) in Brussels and guest researcher at the Mercator Research Centre on Global Commons and Climate Change and at the German Institute for Economic Research (DIW Berlin), institutions where he previously held postdoc positions. He holds a PhD from the Paris School of Economics and is particularly interested in the distributional consequences of climate policies, including questions of just transition. The EEB is part of the civil-society-led consortium modeling an energy scenario compatible with 1.5 degrees, the Paris-Agreement Compatible (PAC) scenario. Marion Leroutier is a post-doctoral researcher at the Stockholm School of Economics (SSE), based at Misum, a multidisciplinary research center on sustainability and also affiliated with SSE's Department of Economics. She will join ENSAE and CREST as a tenure-track assistant professor in September 2024. In the 2023/2024 academic year, she will be a postdoctoral fellow at the Institute for Fiscal Studies (IFS). She is an applied environmental economist focusing on two major environmental issues, ambient air pollution and climate change. Robert Pietzcker is a senior scientist at the Potsdam Institute for Climate Impact Research (PIK) with a background in physics and economics. He leads the National Energy Transitions Team (together with Falko Ueckerdt) in the Energy Systems group of Research Department 3 – Transformation Pathways. His work focuses on analyzing the energy transition in the EU and Germany and providing insights on the climate policies needed to achieve greenhouse gas neutrality. August 2023, "Why investing in new nuclear plants is bad for the climate", Joule, https://www.sciencedirect.com/science/article/pii/S2542435123002817 // DOA: 3/3/25)JDE

Building new nuclear takes time we do not have The business case and economics may be poor, but in light of the very real threat of climate catastrophe, should we not invest in all alternatives to fossil fuels? **The problem is that building nuclear plants is slow and delivery is uncertain.** Even the International Atomic Energy Agency and Nuclear Energy Agency—organizations promoting the use of nuclear energy—**assume construction times of around one decade**,13 whereas **renewables can come online in**

a fraction of that time. Given lags in planning and regulatory approval, any new nuclear plants would come online too late to help decarbonize our economies on time. **However, even this time frame appears optimistic: all recent nuclear new-builds in Organisation for Economic Cooperation and Development (OECD) countries have been seriously delayed—Olkiluoto took 16 years instead of five, while Flamanville is over 11 years behind schedule.** The 5th and 6th EPR plants offer a similarly bleak picture: plans to build Hinkley Point C were first announced in 2008, with an aim of going online in the early 2020s. Grid connection is now planned for 2026. For Sizewell C, community consultation began in 2012, the planning application was submitted in 2020, and the reactor is expected to become operational in 2032**. Given these time horizons, delays, and associated cost overruns, investments in nuclear power appear to be very dangerous bets in light of the need to quickly reduce EU power sector emissions by 2030** and to close to zero before 2040 in line with climate objectives. Finally, Granger et al.16 investigate various SMR technologies and fail to see how any could make a "significant contribution to greenhouse gas mitigation by the middle of this century." Conclusion: **In solving the climate crisis, new nuclear is a costly and dangerous distraction With ample time, it may be possible to build nuclear power to the highest safety standards and remain economical even taking into account costs of storing nuclear waste for thousands of years. However, building nuclear plants takes many years of planning and construction and is costly, while the climate crisis demands urgency and requires such large investments that cost efficiency is of key importance**. Relying on nuclear new-builds to achieve the EU climate targets is virtually impossible: even under very optimistic assumptions, new nuclear in France will only start providing low-emission electricity in 2035—too late for the much faster reductions of power sector emissions required by the EU climate targets. And what would happen if there is further delay, as was the case for all recent nuclear constructions in OECD countries? **In a decarbonizing world, delays in nuclear constructions translate to increased emissions. If governments and economic actors believe that nuclear power will come online at a certain date, they will not make alternative plans, and without alternative plans, the current carbon-intensive electricity system will remain in place—rendering climate targets unachievable.**

Nuclear energy won't be implemented quickly enough

Sovacool and Cooper 8 (Benjamin K. Sovacool is a Research Fellow in the Energy Governance Program at the Centre on Asia and Globalization, part of the Lee Kuan Yew School of Public Policy at the National University of Singapore. He is also an Adjunct Assistant Professor at the Virginia Polytechnic Institute & State University. Christopher Cooper is Principal Partner for Oomph Consulting, LLC, and the former Executive Director of the Network for New Energy Choices. 2008, "Nuclear Nonsense: Why Nuclear Power is No Answer to Climate Change and the W Change and the World's Post-Kyoto Energy Challenges gy Challenges", William & Mary Environmental Law and Policy Review, https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1040&context=wmelpr, DOA: 3/2/24) RWC

Nuclear power plants have long construction lead times and meet with a plethora of uncertainties during the construction process, making planning and financing difficult, especially when the balance of supply and demand for electricity can change rapidly within a short period of time. Long construction times become significant because costs mount quickly during construction delays. Halting construction of a nuclear power plant for two years, for example, adds about fifteen percent to the final cost of electricity.'48 **The nuclear demonstration plant at Shippingport, Pennsylvania, for instance, was budgeted at forty-eight million dollars in the early 1950s, but ended up costing eighty-four million dollars by the time it was completed on December 2, 1957,** and that excludes government subsidies and R&D costs.'49 In the 1970s and 1980s excessively high forecasts of growth in demand for electricity led to overbuilding of generating plants and massive electric system cost over-runs in many states. One infamous example was in Washington State, where the Washington Public Power System ("WPPS") began a construction program for as many as seven new nuclear power plants in the early 1970s.50 WPPS believed that regional electricity requirements "would grow by 5.2

percent each year" well into the 1990s and started building nuclear power plants to meet their projections." **At the same time, the massive backlog of nuclear power plant orders after the 1973 oil crisis caused a severe shortage of skilled nuclear engineers and architects; sixty-nine plants were ordered in 1973 and 1974**.152 "[**Problems of plant design, poor craftsmanship, and labor strikes caused even longer delays; five-year construction estimates lengthened to tenor twelve-year periods."**'53 One WPPS project started in 1970 was not finished until 1984,"M and the WPPS annual report in 1981 projected that $23.7 billion was needed to complete one of its plants after $5 billion had already been expended,' 5 all the while electricity growth dropped significantly below original projections.'56 By the mid-1980s, WPPS faced financial disaster and all but one of the plants was cancelled, leading to the country's largest municipal bond default.5 7 The entire experience came to be called the "WHOOPS" fiasco, as a play on the WPPS acronym, and is an enduring lesson of the risk associated with investing in large power plants. Consumers across the Northwest are still paying for WHOOPS in their monthly electricity bills. 5 "While WHOOPS is perhaps the most spectacular example, ... similar 'boom and bust' cycles in nuclear power plant construction and cost-overruns occurred in many states during... [the 1980s], and directly produced the high electricity rates... [that spurred] the 'electric restructuring' movement of the mid-1990s." 59 "[B]etween 1972 and 1984, . . . more than $20 billion in construction payments flowed into 115 nuclear power plants that were subsequently abandoned by their sponsors.""8 The Shoreham Nuclear Power Plant adjacent to the Wading River in East Shoreham, New York cost ratepayers $6 billion, but was closed by protests in 1989 before the plant could generate a single kWh of electricity. 6' **Indeed, an assessment recently undertaken by the Congressional Budget Office of the actual construction costs for seventy five of the existing nuclear power plants in the United States documented that they exceeded anticipated costs by more than 300 percent.** The quoted cost for these plants by the industry was $2312 per installed kW-totaling $89.1 billion, but the real cost was an astronomical $7294 per installed kW--exceeding $283.8 billion.162 The estimated and actual costs of the seventy-five U.S. nuclear plants can be found in Appendix Table A. Across the border in Canada, delays and cost overruns on nuclear power plants accounted for 15 billion of the nearly 20 billion Canadian dollars of "stranded debt" created by Ontario Hydro.16 3 The risk of construction cost overruns is not relegated to the past. **Modern nuclear plants are the most expensive and capital intensive structures ever built and they are the lynchpin of an industry that is already the most capital intensive in the entire U.S. economy.**"M Luis Echdvarri, head of the Nuclear Energy Agency ("NEA"), reports that initial construction of a new nuclear reactor consumes close to 60% of the project's total investment, compared to about 40% for coal and 15% for natural gas power plants. 65 Even assuming the low-end of industry averages, new reactors would cost around $2000 per installed kW-meaning a 4 GW plant will cost $8 billion to build." The price tag for building 190 reactors in the U.S. at this rate would exceed $380 billion.

Renewables are key to sustaining the grid

Climate Nexus 17 (Climate Nexus is a non-profit journalism and climate communication organization. The organization is primarily focused on the role of the United States in Climate Change. May 31, 2017, “Integrating Reliable Renewable Energy into the U.S. Electrical Grid” Climate Nexus, https://climatenexus.org/climate-issues/energy/integrating-reliable-renewable-energy-u-s-electrical-grid/?utm_source=chatgpt.com, DOA: 3/28/25) LLO

In 2016, renewable energy accounted for over half of all new generating capacity for the third consecutive year. This rapid expansion of wind and solar capacity throughout the U.S. electrical grid has contributed many benefits to our electricity system. These include a more secure and reliable grid, cost savings for consumers and health, economic and environmental gains. The growth of renewables contributed to a reduction in power sector carbon emissions — in 2015 emissions reached their lowest point since 1993. All renewable sources combined provide about 15 percent of U.S. electricity, though that percentage varies from state to state. **The falling cost of gas and renewables has made it harder for coal and nuclear power to compete on price.** The growth of renewable energy enables grid operators to draw power from a more diverse range of sources. Throughout history, operators worked with the inherent variability and uncertainty of all power sources, as well as fluctuation in demand to maintain reliable electricity for customers. While the output of renewable energy varies with the changing conditions of wind and sun, balancing the changes in supply and demand does not present an entirely new challenge. **Renewables are helping to drive technological advances that are modernizing the grid while increasing its security and lowering costs. Government studies show that renewables give grid operators new tools to maintain reliability, and their widespread distribution can balance out daily intermittency.** The National Renewable Energy Laboratory (NREL) estimates that renewables could supply up to four-fifths (p. iii) of total U.S. power generation by 2050 while balancing supply and demand. California, Texas and Iowa are currently demonstrating the benefits that

renewables provide to the grid, through a combination of widespread deployment, innovative regulation and cutting-edge technology. Maintaining Grid Reliability **Today's power grid is heavily reliant on aging infrastructure which "makes it susceptible to a wide variety of threats including** severe weather and other natural disasters, **direct physical attack or cyberattack, and accidents associated with the age of the grid or human error**" (p. 1), according to the CNA Military Advisory Board. For example, **extreme weather can present major challenges to maintaining grid reliability with traditional coal and nuclear plants. The January 2014 polar vortex brought such frigid temperatures to the eastern and southern U.S. that some coal plants shut down** because they could not access frozen coal stockpiles (p. 3). Although gas usage rose and prices spiked due to higher demand, **grid operators were able to maintain power supply with strong wind power output and temporary reductions to consumer electricity use, demonstrating that a more diverse grid increases resilience to a wide array of potential disturbances.**

If the power grid goes down the military loses readiness and increases likelihood of an attack

CNA 09 (The Center for Naval Analyses is a federally-funded nonprofit research and analysis organization based in Arlington County, Virginia. May 2009, "Powering America's Defense: Energy and the Risks to National Security" CNA (Center for Naval Analyses), https://www.cna.org/archive/CNA_Files/pdf/mab_2-final.pdf , DOA: 3/28/25) LLO

As the resiliency of the grid continues to decline, it increases the potential for an expanded and/ or longer duration outage from natural events as well as deliberate attack. The DSB noted that the military's backup power is inadequately sized for its missions and military bases cannot easily store sufficient fuel supplies to cope with a lengthy or widespread outage. An extended outage could jeopardize ongoing missions in far-flung battle spaces for a variety of reasons: • **The American military's logistics chains operate a just-in-time delivery system** familiar to many global businesses. **If an aircraft breaks down in Iraq, parts may be immediately shipped from a supply depot in the U.S. If the depot loses power, personnel there may not fill the order for days, increasing the risk to the troops in harm's way.** • **Data collected in combat zones are often analyzed at data centers in the U.S. In many cases, the information helps battlefield commanders plan their next moves. If the data centers lose power, the next military move can be delayed, or taken without essential information. • The loss of electrical power affects refineries, ports, repair depots, and other commercial or military centers that help assure the readiness of American armed forces. When power is lost for lengthy periods, vulnerability to attack increases.** President Obama, Congress, and major utilities, among others, are discussing an upgrade of the national electrical grid for a variety of reasons. We add our voice to this discussion with a singular perspective: **we see that our national security is directly linked to the security and reliability of our system of energy production and delivery.**

A wide range of actors would attack

Ribeiro 25 (Anna Ribeiro Industrial Cyber News Editor. Anna Ribeiro is a freelance journalist with over 14 years of experience in the areas of security, data storage, virtualization and IoT. March 26, 2025, "ODNI 2025 Threat Assessment notes threats from Russia, China, Iran, North Korea targeting critical infrastructure, telecom" Industrial Cyber, https://industrialcyber.co/reports/odni-2025-threat-assessment-notes-threats-from-russia-china-iran-north-korea-targeting-critical-infrastructure-telecom/, DOA: 4/2/25) LLO

The Office of the Director of National Intelligence (ODNI) identified in its 2025 Annual Threat Assessment of the U.S. intelligence community that Russia, China, Iran and North Korea, individually and collectively, are challenging U.S. interests in the world by attacking or threatening others in their regions, with asymmetric and conventional hard power tactics and promoting alternative systems to compete with the U.S., primarily in trade, finance, and security. The 2025 Threat Assessment report highlights that **a wide range of foreign actors are targeting U.S.** health and safety, **critical infrastructure**, industries, wealth, and government. **It emphasizes that state adversaries and their proxies are also trying to weaken and displace U.S. economic and military power in their regions and across the globe.** The ODNI said in its report that a range of cyber and intelligence actors target wealth, critical infrastructure, telecom, and media. **Nonstate groups are often enabled, both directly and indirectly, by state actors, such as China and India, as sources of precursors and equipment for drug traffickers. "State adversaries have weapons that can strike U.S. territory or disable vital U.S. systems in space for coercive aims or actual war. These threats reinforce each other, creating a vastly more complex and dangerous security environment." It added that both state and nonstate actors pose multiple immediate threats to the Homeland and U.S. national interests. "Terrorist and transnational criminal organizations are directly threatening our citizens.** Cartels are largely responsible for the more than 52,000 U.S. deaths from synthetic opioids in the 12 months ending in October 2024 and helped facilitate the nearly three million illegal migrant arrivals in 2024, straining resources and putting U.S. communities at risk." The ODNI 2025 Threat Assessment report detailed financially motivated cyber criminals continue to prey on inadequately defended U.S. targets, such as healthcare systems and municipal governments, that could have a broad impact on the U.S. populace and economy. Others have conducted attacks on critical infrastructure, disrupting utility company business networks or manipulating poorly secured control systems. In mid-2024, ransomware actors attacked the largest payment processor for U.S. healthcare transactions, hampering prescriptions and causing extended delays in accessing electronic health records, patient communications, and medication ordering systems and forcing some ambulances to divert patients to other hospitals. Also, U.S. water infrastructure has become a more common target. Last October, criminal actors conducted cyber attacks against both large and small water utilities in the U.S., possibly inspired by attacks against water infrastructure by Russian hacktivists and Iranian cyber actors in 2023 that had little effect but drew substantial publicity. The ODNI noted that the **PRC remains the most active and persistent cyber threat to the U.S. government, private sector, and critical infrastructure networks. "The PRC's campaign to preposition access on critical infrastructure for attacks during crisis or conflict**, tracked publicly as Volt Typhoon, and its more recently identified compromise of U.S. telecommunications infrastructure, also referred to as Salt Typhoon, demonstrates the growing breadth and depth of the PRC's capabilities to compromise U.S. infrastructure." **It added that if Beijing believed that a major conflict with Washington was imminent, it could consider aggressive cyber operations against U.S. critical infrastructure and military assets. Such strikes would be designed to deter U.S. military action by impeding U.S. decision-making, inducing societal panic, and interfering with the deployment of U.S. forces.** The ODNI 2025 Threat Assessment report mentioned that China is using an aggressive, whole-of-government approach, combined with state direction of the private sector, to become a global S&T superpower, surpass the United States, promote self-reliance, and achieve further economic, political, and military gain. Beijing has prioritized technology sectors such as advanced power and energy, AI, biotechnology, quantum information science, and semiconductors, further challenging U.S. efforts to protect critical technologies by tailoring restrictions narrowly to address national security concerns. "China is accelerating its S&T progress through a range of licit and illicit means, to include investments, intellectual property acquisition and theft, cyber operations, talent recruitment, international collaborations, and sanctions evasion," the 2025 Threat Assessment report observed. "Some forecasts indicate China's technology sectors will account for as much as 23 percent of its gross domestic product by 2026, more than doubling since 2018. In addition to private funding, the PRC government is investing hundreds of billions of dollars in priority technologies, such as AI, microelectronics, and biotechnologies, in pursuit of its self-reliance goals." It also recognized that China almost certainly has a multifaceted, national-level strategy designed to displace the United States as the world's most influential AI power by 2030. China is experiencing a boom in generative AI with the rapid emergence of a large number of PRC-developed models and is broadly pursuing AI for smart cities, mass surveillance, healthcare, S&T innovation, and intelligent weapons. The report expects that the PRC will likely continue posturing to be in a position of advantage in a potential conflict with the United States. The PRC will continue trying to press Taiwan on unification and will continue conducting wide-ranging cyber operations against U.S. targets for espionage and strategic advantage. China will likely struggle to constrain the activities of PRC companies and criminal elements that enable the supply and trafficking of fentanyl precursors and synthetic opioids to the United States, absent greater law enforcement actions. Also, China's military operations to project power over Taiwan and its efforts to assert sovereignty claims in the South and East China Seas occur routinely with confrontations that increase the concern of miscalculations potentially leading to conflict. China has demonstrated the ability to compromise U.S. infrastructure through formidable cyber capabilities that it could employ during a conflict with the U.S. The ODNI 2025 Threat Assessment report detailed that **Russia's advanced cyber capabilities, its repeated success compromising sensitive targets for intelligence collection, and its past attempts to pre-position access on U.S. critical infrastructure make it a persistent counterintelligence and cyber attack threat.** Moscow's unique strength is the practical experience it has gained integrating cyber attacks and operations with wartime military action, almost certainly amplifying its potential to focus combined impact on U.S. targets in time of conflict. Also, Russia has demonstrated real-world disruptive capabilities during the past decade, including gaining

experience in attack execution by relentlessly targeting Ukraine's networks with disruptive and destructive malware. The report also observed that Russia continues to train its military space elements and field new anti-satellite weapons to disrupt and degrade U.S. and allied space capabilities. It is expanding its arsenal of jamming systems, directed energy weapons (DEWs), on-orbit counterspace capabilities, and ASAT missiles designed to target U.S. and allied satellites. Russia is using EW to counter Western on-orbit assets and continues to develop ASAT missiles capable of destroying space targets in LEO. The ODNI 2025 Threat Assessment report identified that Russia will continue to be able to deploy anti-U.S. diplomacy, coercive energy tactics, disinformation, espionage, influence operations, military intimidation, cyberattacks, and gray zone tools to try to compete below the level of armed conflict and fashion opportunities to advance Russian interests. It also mentioned that Iranian investment in its military has been a key plank of its efforts to confront diverse threats and try to deter and defend against an attack by the U.S. or Israel**. Iran continues to bolster the lethality and precision of its domestically produced missile and UAV systems, and it has the largest stockpiles of these systems in the region.** It considers them critical to its deterrence strategy and power projection capability, and Iran uses their sales to deepen global military partnerships. **Iran's growing expertise and willingness to conduct aggressive cyber operations also make it a major threat to the security of U.S. and allied and partner networks and data.** Iran's growing expertise and willingness to conduct aggressive cyber operations make it a major threat to the security of U.S. networks and data. **Guidance from Iranian leaders has incentivized cyber actors to become more aggressive in developing capabilities to conduct cyber attacks.** Iran often amplifies its influence operations with offensive cyber activities. During the Israel-HAMAS conflict, U.S. private industry tracked Iranian influence campaigns and cyber attacks. In June 2024, an IRGC actor compromised an email account associated with an individual with informal ties to then-former President Trump's campaign and used that account to send a targeted spear-phishing email to individuals inside the campaign itself. The IRGC subsequently tried to manipulate U.S. journalists into leaking information illicitly acquired from the campaign. "**North Korea is funding its military development—allowing it to pose greater risks to the United States**—and economic initiatives by stealing hundreds of millions of dollars per year in cryptocurrency from the United States and other victims," the ODNI 2025 Threat Assessment report noted. "Looking forward, the North may also expand its ongoing cyber espionage to fill gaps in the regime's weapons programs, potentially targeting defense industrial base companies involved in aerospace, submarine, or hypersonic glide technologies." The ODNI 2025 Threat Assessment report states that Iran has become a key military supplier to Russia, especially of UAVs, and in exchange, Moscow has offered Tehran military and technical support to advance Iranian weapons, intelligence, and cyber capabilities. "North Korea has sent munitions, missiles, and thousands of combat troops to Russia to support the latter's war against Ukraine, justified as fulfilling commitments made in the Treaty on Comprehensive Strategic Partnership that Pyongyang and Moscow announced in June 2024."

US respond with nuclear weapons to conventional attack

Snider 22 (Ted Snider is a regular columnist on U.S. foreign policy and history at Antiwar.com and The Libertarian Institute. He is also a frequent contributor to Responsible Statecraft and other outlets. Oct 27, 2022, "When the US threatens to use nuclear weapons" Responsible Statecraft, https://responsiblestatecraft.org/2022/10/27/when-the-us-threatens-to-use-nuclear-weapons/?utm_source=chatgpt.com, DOA: 3/29/25) LLO

The U.S. statement goes beyond that**. The State Department announcement states that its nuclear retaliation policy would be triggered not only by an attack on the U.S. but also by an attack on U.S. allies.** And this is not an aberration. Sherman was not going rogue or speaking irresponsibly. **The 2018 U.S. Nuclear Posture Review states that "the United States would only consider the employment of nuclear weapons in extreme circumstances to defend the vital interests of the United States, its allies, and partners. Extreme circumstances could include significant non-nuclear strategic attacks.**" (Editor's note: Biden's new 2022 Nuclear Posture Review announced Thursday afternoon reaffirms this statement entirely.) **The U.S. also insists that it "has never adopted a 'no first use' policy." Washington, then, seems to have the most permissive nuclear first strike policy in the world today**, given that its use of nuclear weapons extends to the defense of "allies and partners" and not just self-defense. **This is not the first time the U.S. has threatened North Korea with its ultimate firepower. In his 2017 UN address, Trump insisted that "the United States has great strength and patience, but if it is forced to defend itself or its allies, we will have no choice but to totally destroy North Korea."** A month earlier, **Trump threatened that if North Korea made "any more threats to the United States. . . . they will be met with fire and fury like the world has never seen."**

Contention Two is Accidents

Trump tying regulation and politics ensures nuclear accidents and decks public perception – vast empirics prove – new investments are unsafe

Katy **Huff**, Paul Wilson, Michael Corradini, **3-6**-2025, [Katy Huff is a former Department of Energy assistant secretary for nuclear energy and is currently an associate professor at the University of Illinois in Urbana-Champaign; Paul Wilson is the Grainger Professor of Nuclear Engineering and the chair of the University of Wisconsin–Madison's department of nuclear engineering and engineering physics; Michael Corradini a former member of the U.S. Advisory Committee on Reactor Safeguards, a former president of the American Nuclear Society and a professor emeritus at the University of Wisconsin–Madison.] "Killing a Nuclear Watchdog's Independence Threatens Disaster," Scientific American, https://www.scientificamerican.com/article/killing-a-nuclear-watchdogs-independence-threatens-disaster/, accessed 3-23-2025 //cy

A Trump administration executive order is setting the U.S. on the **fastest path to a nuclear accident**.

Announced on February 18, the "Ensuring Accountability for All Agencies" executive order aims to bring independent regulatory agencies under the "supervision and **control" of the president**. Among them, the Nuclear Regulatory Commission is the watchdog that Americans rely on to hold nuclear energy companies accountable for avoiding reactor accidents and releases of radioactive material into the environment.

By demanding that the NRC cease to issue regulations and guidance without written permission from the president or the attorney general, the order effectively demands that nuclear safety take a back seat to politics.

As nuclear engineers, as well as former government and industry officials, we foresee that this proposed regulatory capture by the Executive Office of the President—where decisions are made for political reasons and not for the benefit of people served—**will severely increase the risk of expensive, unexpected nuclear accidents** in the U.S.

This is neither hypothetical nor hyperbole.

History provides **too much frightening evidence** to ignore. When Soviet leadership and its captured regulator prioritized national pride over safety, a known flaw in nuclear reactor control rods (which slow the rate of atomic fission in a reactor) went unchecked, safety protocols at the Chernobyl Nuclear Power Plant went unheeded, and in 1986 the **worst nuclear power accident in history** resulted.

So too when "regulation was entrusted to the same government **bureaucracy responsible for its promotion**," the operators of Japan's Fukushima Daiichi Nuclear Power Plant **failed to deploy countermeasures** demanded by known seismic risks; they failed to plan appropriately for evacuation; and in 2011, they failed to avoid the second worst nuclear power accident in human history.

In 1974 Congress recognized the importance of independent nuclear oversight, reorganizing the Atomic Energy Commission into two distinct agencies: the Department of Energy, responsible for research, development and promotion of nuclear energy; and the NRC, to regulate and oversee the then-booming nuclear energy industry. Five NRC commissioners, each appointed by the president and confirmed by the Senate, work together to "formulate policies and regulations governing nuclear reactor and materials safety, issue orders to licensees, and adjudicate legal matters brought before [them]." The president has the authority to designate one of these commissioners as the chair, acting as the chief executive officer of the agency.

International consensus is clear about what works and what doesn't in nuclear safety regulation. Most fundamentally, the regulator's ability to ensure safe nuclear power operation requires independence, especially from entities with a conflict of interest. The International Atomic Energy Agency, humanity's foremost authority on nuclear energy safety and security, is clear that governments must ensure that the regulatory body is not influenced by "entities having responsibilities or interests that could unduly influence its decision making." Failure to maintain regulatory independence from commercial, political and ideological influence is not accountability. It is instead regulatory capture.

Both President Trump and Secretary of Energy Chris Wright, by virtue of their offices, have responsibilities and interests that demand efforts to expand nuclear power. The country's continued prosperity relies heavily on secure access to reliable energy, and nuclear energy has a unique role in meeting our energy demands. Nuclear energy is one of the nine pillars of Wright's secretarial order calling for action to "unleash American Energy." In a recent CNBC interview, when describing his optimism for growth in nuclear energy, Wright recently declared, "Do we need some government out of the way to make it work economically? Absolutely, but that's what America is about."

That's true only if industrial accidents are also what America is about. In reality an independent regulator plays a **fundamental role** in generating public confidence in the safe and secure deployment of nuclear technology. While discussions about the effectiveness of the agency are appropriate, such discussions never question the importance of its continued independence. Even for officials in the Office of Nuclear Energy at DOE, the independence of the NRC is a red line no one would ever consider crossing, precisely because DOE's role involves the enthusiastic promotion of nuclear energy.

Nuclear energy relies on precision technology and an unwavering dedication to safety, so regulating it is a serious technical undertaking meant to shield us from unwanted radiological consequences. The U.S. has historically been a **global leader** in nuclear regulatory practices and principles that **uphold the highest standards of safety globally**. A critical component of their operation is independence from conflicting motives. Nuclear safety is too important to undermine through uninformed political actions. Regulatory capture by industry, politics or the whims of an individual is not merely dangerous—it is the primary cause of the two worst nuclear reactor accidents the world has known. We cannot allow this to occur in the U.S.

The NRC must remain independent to provide the public confidence in the safe implementation of this important technology.

Political influence causes accidents and industry shutdown – their defense relies on faulty models

Allison Macfarlane, 2-21-2025, [professor and director of the School of Public Policy and Global Affairs @ the University of British Columbia, chaired US Nuclear Regulatory Commission from 2012-2014, doctorate in geology from MIT, served on the White House Blue Ribbon Commission on America's Nuclear Future] "Trump just assaulted the independence of the nuclear regulator. What could go wrong?," Bulletin of the Atomic Scientists, https://thebulletin.org/2025/02/trump-just-assaulted-the-independence-of-the-nuclear-regulator-what-could-go-wrong/, accessed 3-10-2025 //cy

**SMR = small modular reactor, NRC = nuclear regulatory commission

What could go wrong? Several possible outcomes could occur because of Trump's new executive order assaulting the independence of the Nuclear Regulatory Commission (NRC).

Proponents of small modular reactors, for instance, have pressured **Congress and the executive branch** to **reduce regulation** and hurry the NRC's approval of their novel—and **unproven**—reactor designs. They wish their reactors could be exempted from the requirements that all other designs before them have had to meet: detailed evidence that the reactors will operate safely under accident conditions. Instead, these proponents—some with **no experience in operating reactors**—want the NRC to trust their **simplistic computer models** of reactor performance and essentially give them a free pass to deploy their **untested technology** across the country.

An accident with a new small modular reactor (SMR) would perhaps not make such a big mess: After all, the source term of radiation would be smaller than with large reactors, like those currently operating in the United States. But the **accident in Japan** demonstrated that countries should expect that **more than one** reactor at a given site can fail at the same time, and these multiple failures can create even more **dire circumstances,** impeding the authorities' ability to respond to such a **complex radiological emergency.** At Fukushima, the first explosion at Unit 1 generated radioactive debris that prevented emergency responders from getting close to other damaged reactors nearby. Since designers plan to deploy multiple SMR units to individual sites, such an accidental scenario appears feasible with SMRs.

Since its creation in 1975, the Nuclear Regulatory Commission has had an excellent and essential mission: to ensure the safety and security of nuclear facilities and nuclear materials so that humans and the environment are not harmed. Trump's incursion means the agency will no longer be able to fully follow through with this mission **independently**—and Americans will be more at risk as a result. If any US reactor suffers a major accident, the **entire industry will be impacted**—and perhaps its **94 reactors in operation** will even be temporarily **shut down**. Can the industry and the American people afford the cost of losing the independence of the nuclear regulator?

Extinction – food, ecosystems, poison

Christopher Allen **Slocum 15**, VP @ AO&G, "A Theory for Human Extinction: Mass Coronal Ejection and Hemispherical Nuclear Meltdown," 07/21/15, The Hidden Costs of Alternative Energy Series, http://azoilgas.com/wp-content/uploads/2018/03/Theory-for-Human-Extinction-Slocum-20151003.pdf

With our intelligence we have littered the planet with massive spent nuclear fuel pools, emitting **lethal radiation** in over-crowded conditions, with circulation requirements of **electricity**, **water**-supply, and neutron **absorbent chemicals**. The failure of **any** of these conditions for any calculable or incalculable reason, will release all of a pool's **cesium** **into** the **atmosphere**, causing 188 square miles to be contaminated, 28,000 cancer deaths and $59 billion in damage. As of 2003, 49,000 tons of SNF was stored at 131 sites with an additional 2,000-2,400 metric tons produced annually. The NRC has issued permits, and the nuclear industry has amassed unfathomable waste on the premise that a deep geological storage facility would be available to remediate the waste. The current chances for a deep geological storage facility look grim. The NAS has required geologic stability for 1,000,000 years. It is impossible to calculate any certainty 1,000,000 years into the future. Humanity could not even predict the mechanical failures at Three Mile Island or Chernobyl, nor could it predict the size of the tsunami that triggered three **criticality** events at Fukushima Daiichi. These irremediable crises span just over 70 years of human history.

How can the continued production and maintenance of SNF in pools be anything but a **precedent** to an **unprecedented human cataclysm**? The Department of Energy's outreach website explains nuclear fission for power production, providing a timeline of the industry. The timeline ends, as does most of the world's reactor construction projects in the 1990s, with the removal of the FCMs from Three Mile Island. One would think the timeline would press into the current decade, however the timeline terminates with the question, "How can we minimize the risk? What do we do with the waste?" (The History of Nuclear Energy 12). Nearly fifteen years into the future, these questions are no closer to an answer. The reactors at Fukushima Daiichi are still emitting radioisotopes into the atmosphere, and their condition is unstable. TEPCO has estimated it could take forty years to recover all of the fuel material, and there are doubts as to whether the decontamination effort can withstand that much time (Schneider 72). A detailed analysis of Chernobyl has demonstrated that nuclear fall-out, whether from thermonuclear explosions, spent fuel pool fires, or reactor core criticality events are deleterious to the **food-chain**. **Cesium** and strontium are taken into the **roots** of **plants** and **food** crops, causing direct **human** and **animal** contamination from ingestion, causing cancer, teratogenicity, mutagenesis and death. Vegetation suffers mutagenesis, reproductive loss, and death. Radioactive fields and **forest** floor**s** **decimate** **invertebrate** and **rodent variability** and number necessary to supply nature's **food-chain** and **life** **cycles**. The **flesh and bones** of freshwater and oceanic biota contribute significantly to the total radiation dose in the food-chain. Fresh **water** **lakes**, **rivers** and **streams** become radioactive. Potable **aquafers** directly underlying SNFs and FCMs are penetrated by downward migration of radioisotopes. **Humans must eat to live. Humans must have water.** **No human can survive** **5** **Sv** **of exposure** to ionizing radiation, many cannot survive exposure to 1 Sv.

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