## **Contention 1 is China.**

#### **America is setting itself back globally. Shepherd 4-4**

**Shepherd 4-4** [Christian Shepherd, China correspondent for The Washington Post. He previously covered the country for the Financial Times and Reuters from Beijing , 4-4-2025, "After Trump tariffs, China offers ‘trauma bonding’ with U.S. partners", Washington Post, https://www.washingtonpost.com/world/2025/04/04/trump-tariffs-china-global-trade/, accessed 4-4-2025.] //aayush

**In the upheaval of President Donald Trump’s blanket tariffs**, **China is seeking common cause with jilted partners of the United States as it tries to extend its influence and take center stage in a new trade order** — rebuilt without Washington. **China had already been working to exploit cracks in international leadership created by Trump’s “America First” foreign policy**. As the **United States has slashed development aid, abandoned climate talks and temporarily suspended military assistance to Ukraine, Beijing has ramped up its own alternative vision on each issue**. Trump’s emerging **global trade war gives Chinese leader Xi Jinping an additional lever to build influence**. “Beijing is **stepping up efforts to court U.S. allies and partners who remain stunned and disappointed by the new U.S. tariff hikes aimed at them**,” said Wendy Cutler, vice president at the Asia Society Policy Institute and a former U.S. trade negotiator. Trump this week imposed “**reciprocal**” **tariffs of between 10 and 49 percent on almost all other trading partners**. But **China**, which ran a trade surplus with the U.S. approaching $1 trillion last year, **was hit particularly hard**: From April 9, its exports to the United States will be hit with a minimum tariff rate of **54 percent**. China, the world’s second-largest economy, **announced 34 percent tariffs Friday on all U.S. goods, along with restrictions on exports of rare earth metals used to make high-tech products, along with a slew of other measures targeting American companies**. Even before Trump’s announcement, Beijing had been making overtures to other countries in a charm offensive fueled by his return to the White House. **In calls and meetings with officials from the European Union, South Korea and Japan in recent weeks, high-ranking Chinese officials have offered to join forces to resist Trump’s protectionism and “bring certainty to global trade.”** China and **the E.U.** should “jointly resist unilateralism and protectionism to protect the multilateral trading system,” Vice Premier He Lifeng last month told Maros Sefcovic, the European commissioner for trade, according to an official Chinese readout. Xi, the most powerful Chinese leader in decades, has sometimes led the outreach himself. Xi on Tuesday called for a “**Dragon-Elephant tango**” to **improve frayed diplomatic ties with India**, a day after the Chinese ambassador to New Delhi promised that China would buy more Indian products and a mere six months since they reached a deal to end four years of a sometimes violent border dispute. Now, **as the world reels from the tariffs, Beijing has an opportunity to build, or mend, ties with American partners over a sudden shared grievance with the United States**. “**Everyone feels attacked** by the U.S. and the victims can empathize with each other **through trauma bonding**,” said Xing Yue, director of the Center for Chinese Foreign Policy at Tsinghua University in Beijing. “**Previously, these allies followed the U.S. to isolate and attack China, but now they have become victims themselves**.” **Xi will reportedly visit Vietnam, Cambodia and Malaysia in the coming weeks**, countries which Trump hit with duties of 46, 49 and 24 percent respectively. There, **analysts expect Xi will present China as a defender of the existing international trade system**. **He may find** some **sympathetic ears**. Malaysia is still hoping to negotiate with the Trump administration on tariffs in the short term. “But in the medium to longer term, **Malaysia will slowly pivot to other regions and be less dependent on the U.S. for trade and investment flows**,” said Ong Kian Ming, board director of the Malaysian Investment Development Authority in Kuala Lumpur. Beijing has been quick to cast itself as a reliable partner and one among many injured parties that must come together to weather the tariff storm. “While countries around the world expand ‘circles of friends’ for trade,” **America’s imposition of tariffs means it is “self-isolating” from a network of global trade agreements**, said a blog post by state broadcaster China Central Television (CCTV). The **tariffs are “not only aimed at China, but the world,”** said He Weiwen, a senior fellow at the Center for China and Globalization, a think tank based in Beijing. “**The goal of ‘Liberation Day’ is to change the U.S. trade relationship with the world**.”

#### **Nuclear energy is key to countering China -- we’re neck and neck now. Sandstrom 25**

**Sandstrom**, Andrew, and Grayson Massey. “Opinion: Utah Is Right to Lead with Nuclear.” Deseret News, March 11, **2025**. https://www.deseret.com/opinion/2025/03/11/utah-leads-nuclear-energy-ai-data-centers/. [Andrew writes on energy and environmental issues and is the host of the Public Lands Policy Podcast. Grayson is the Western region director for the Young Republican National Federation.] //arrguy

Utah is booming. We had the third-fastest growing economy of any state over the last five years, and the population continues to increase. **But a booming economy means greater demand for energy and the very real threat of higher prices.** Utah needs a lot more energy — and we need it quickly. **The best way to meet this rising demand is to invest in nuclear energy.** That is why we need more leaders in our state to step up and join the movement to do just that. When it comes to leading-edge technology, this is the place. Artificial intelligence data centers are bringing jobs and opportunity to Utah, enabling Utahns to play a leading role in strengthening America’s national security. As Senate President Stuart Adams puts it: “The country that controls AI will control the world.” America must win the AI race, which means Utah must continue to make advances in AI. **But the energy cost of AI is staggering. Each data center requires several gigawatts of energy — enough to power millions of homes.** The entire state of Utah currently runs on just four gigawatts. The good news is that Utah’s elected officials recognize this need and are taking action. Gov. Spencer Cox launched Operation Gigawatt to double Utah’s energy production in a decade. Adams wants to triple it by 2050. Such a dramatic increase in energy production is an enormously difficult task. **But a growing number of leaders recognize that Utah can meet this challenge if we invest in nuclear energy. Cox and Republican leadership in the state Legislature have proposed the innovative solution of using small modular reactors (SMRs) to power our data centers — something that has never been done in America. SMRs have about one-third the capacity of a modern nuclear plant, but they take up far less space and are much cheaper and easier to build.** SMR opponents have raised concerns over the safety of nuclear energy. High-profile disasters from nearly a half-century ago still linger on the minds of those who grew up in an era of anti-nuclear activism. But nuclear technology has made incredible strides over the last four decades. **Thanks to advanced reactor designs, passive safety systems and other innovations, today’s nuclear power is the safest form of energy we have. Nuclear is also the most reliable energy known to man by far. A nuclear-powered grid would mean no rolling blackouts, no dirty smokestacks polluting our air and our kids’ lungs, and, of course, lower energy prices, even as Utah’s economy and tech sector continue to grow.** As our new United States Sen. John Curtis has put it, “Nuclear power is a critical component of our clean energy future. Its ability to generate large amounts of electricity with minimal greenhouse gas emissions makes it an invaluable part of our energy grid.” **There is no time to waste: China is neck and neck with us on AI technology and beating us on nuclear energy.** China made the world’s first commercial SMR and plans to build 150 new nuclear reactors in the next decade. View Comments Because of the economic and national security implications of falling behind in this energy race, President Donald Trump, Secretary of Energy Chris Wright and others in Washington are moving aggressively to reform federal energy permitting policies so that we can catch up. **This gives Utah a historic opportunity to take a leading role in nuclear energy — just as we play a leading role in AI.** Utah has always been a state of early adopters, and as with most technologies, there are substantial benefits to being the first to market. Because of its location and existing energy infrastructure, Utah is uniquely poised to lead on next-generation nuclear, and the sooner we adopt this new technology, the more of a boost it will be to Utah’s economy and quality of life for Utahns. The state Legislature realizes this, which is why they have moved quickly this year to advance major legislation to create a Nuclear Energy Consortium and a Utah Energy Council to designate specific zones for SMRs. **By embracing nuclear energy, Utah can secure its place as a leader in both technological innovation and energy independence.** With swift action, we can ensure affordable, reliable and clean energy for generations to come — powering our homes, businesses and critical industries while strengthening America’s national security. Thank you to our state Legislature, Gov. Cox and Sen. Curtis for their ongoing efforts to make this vision a reality.

#### **Investment drives innovation. Holtzman 23**

‌Benjamin **Holtzman**, Nuclear Energy Institute. “Opportunities for Industries,” **2023**. https://www.nei.org/advanced-nuclear-energy/opportunities-for-industries. [Ben is the Director of New Nuclear at the Nuclear Energy Institute. He is an accomplished and results-driven nuclear professional with over 15 years of experience in a variety of regulatory, technical, and business arenas. He currently is focused on developing a more efficient risk-informed regulatory framework, accelerating industry deployment readiness, and engaging with investors and new end-users to understand new nuclear opportunities. Ben has a B.S. in nuclear engineering, a M.S. in nuclear, plasma, & radiological engineering, and an executive M.B.A.] //MH

Industries across the economy are recognizing nuclear’s ability to reduce—or erase—their carbon footprints. **Existing nuclear, small modular reactors, and other advanced nuclear technologies also offer significant opportunities for industry innovation and growth beyond electricity.** Explore Nuclear & Your Industry Aerospace - Nuclear has successfully powered space... ...exploration for decades. Now, the industry is developing new nuclear energy technologies to power the next phase of space travel: early unmanned missions, earth satellites, permanent lunar bases and missions to Mars. Companies such as Zeno Power, X-energy and Ultra Safe Nuclear Corporation are creating next-generation radioisotope power systems to send spacecraft and probes even farther into space. NASA is exploring nuclear thermal propulsion to reduce flight time, enabling human missions to Mars and beyond. As part of the historic Artemis space program, NASA also awarded contracts for a small nuclear power system that could run a permanent base for surface power on the Moon for upwards of 10 years. **Agriculture - Nuclear technologies can reduce the carbon... ...footprint of this industry’s energy intensive processes.** Nuclear can make hydrogen for zero-carbon ammonia production and can also directly provide the process heat required to produce synthetic fertilizers. **Nuclear technology can be used to improve crop yield and develop plant varieties that need less water and are more resistant to the impacts of climate change.** Nuclear’s desalination capabilities can enable irrigation in arid regions and combat water disputes between agricultural, commercial, and residential interests. Nuclear can also help fight against pests, avoiding the need to use harmful pesticides. Irradiating food also kills E. coli, listeria and salmonella, so fresh foods can last longer. **Data Centers and Information Technology - Google and other companies... ...like Microsoft are turning to nuclear energy for a dependable, carbon-free source of power to power their data centers continuously. In the future, data centers may have dedicated, standalone, small modular reactors (SMRs) or microreactors to power their operations “behind the meter.”** SMRs can provide backup power for data centers on the grid and also operate independently of a grid. Some designs for new nuclear facilities also allow for data centers to be co-located on the same site, creating even more efficiencies. Finance, Blockchain, and Cryptocurrency - To address the substantial energy consumption... ...linked to cryptocurrency mining and transactions, businesses are looking towards eco-friendly energy alternatives. Nuclear energy can deliver consistent carbon-free power for continuous mining and transaction processing. Oklo entered a 20-year agreement with Compass Mining to offer 100 percent carbon-free electricity for crypto mining. Energy Harbor signed an agreement with Standard Power to deliver nuclear-generated, carbon-free, electricity to its bitcoin blockchain mining center in Ohio. Additionally, Talen Energy intends to establish a nuclear-powered cryptocurrency mining and data facility adjacent to the Susquehanna nuclear power plant. **Manufacturing - Advanced reactors can provide heat for... ...industrial processes such as chemical production and metal refining, enabling these industries to reduce their carbon footprint. Dow Chemical partnered with X-energy to develop SMR technology, while Nucor has invested in NuScale Power Corporation to support the development of small modular reactor nuclear plants which can meet their needs for reliable carbon-free electricity to power steel production.** Nucor was also the first major industrial company to join the United Nations 24/7 Carbon-Free Energy Global Compact, which is aimed at accelerating the decarbonization of the world's electricity systems to mitigate climate change and ensure access to clean and affordable energy. **Medicine and Health - Nuclear power plants play a crucial role in public health... ...by producing a life-saving resource, Cobalt-60.** This isotope sterilized billions of pieces of medical equipment in hospitals during the height of the COVID -19 pandemic. **Radioisotopes, which are naturally formed during the process of producing reliable, carbon-free electricity, have significant lifesaving applications such as diagnosis and treatments for cancers.** Bruce Power and Ontario Power Generation (OPG) are among the companies that collect these medical isotopes and process them for worldwide distribution. Demand for radioisotopes is continuously increasing. Nuclear radiation is also used to treat food, kill bacteria, and eradicate insects and parasites that cause illness. Lastly, microreactors offer the potential to provide hospitals with clean energy 24/7/365, either independently or as part of a microgrid, without relying on a larger power grid. These compact reactors can be transported by land, air, or sea to remote areas, allowing hospitals in communities with inadequate access to health care or that have been affected by disasters to be powered with reliable energy. Textiles - The textile industry can remove chemicals and... ...pollutants, such as dyes, starches, acids, salts and detergents, from its water by using nuclear electron beam technology. Electron beams can break apart the chemical bonds of clothing dyes and remove pollutants, allowing textile manufacturers to recycle wastewater for reuse. One textile factory in Southern China uses the technique to save up to 4.5 million cubic meters of fresh water annually, which is equivalent to the water consumed by about 100,000 people. The fashion industry, which accounts for nearly 10 percent of global emissions, is also turning to nuclear energy to decarbonize. Transportation - Some of today’s nuclear reactors are demonstrating... ...the capability for carbon-free production of large quantities of hydrogen, which can be used as fuel to power various forms of transportation, including aviation, shipping, heavy transport, fuel-cell trains, and vehicles. Advanced nuclear reactors can produce hydrogen. Nuclear energy is also a highly feasible option for providing steady and reliable carbon-free electricity to EV charging stations 24/7/365.

#### **Nuclear’s uniquely key — Trump’s gutting other R&D. Wong 25**

**Wong-Leung 25** [Jenny Wong-Leung, Data scientist with ASPI’s Cyber, Technology and Security program, 2-27-2025, US cuts to science and technology could fast-track China’s tech dominance, Strategist, https://www.aspistrategist.org.au/us-cuts-to-science-and-technology-could-fast-track-chinas-tech-dominance/, accessed 3-16-2025.] //aayush

Is **the United States now trying to lose the technology race with China**? It certainly seems to be. **The race is tight, and now the Trump administration is slashing funding for the three national institutions that have underpinned science and technology** (S&T) **and what advantage the US still has**. **China is outpacing the US in** the volume of **high-impact research in 57 of the 64 critical technologies in ASPI’s Critical Technology Tracker. The US’s main remaining advantage is downstream in implementing technology**, and **even that’s at risk as China’s significant S&T investments pay off**. Now **the US’s lead may disappear even faster following cuts to the National Institutes of Health** (**NIH**), National Aeronautics and Space Agency (**NASA**) **and** National Science Foundation (**NSF**). **The NIH is the biggest public funder of biomedical research worldwide** and impacts global health in ways often taken for granted. For example, **it supported the foundational work that led to the Haemophilus influenzae type b vaccine which, by some estimates, prevented 1.2 million infant deaths between 2000 and 2015**. **NASA is a stalwart of space research and inadvertently has contributed to medical innovations as it has attended to the health of its astronauts, such as the ear thermometer**. The **NSF funds all non-medical scientific research** (**biology, quantum computing, artificial intelligence, space and advanced materials**) in the US and manages major research facilities. **The NIH stands to lose $4 billion out of the $32 billion already allocated to US research grants in 2024**. This $4 billion cut is not just 11.4 percent of the NIH’s research grants; **it will also limit its ability to cover indirect costs associated with equipment, maintenance, safety and personnel—everything that keeps world-class research facilities ticking**. According to The New York Times, **indirect costs make up 29 percent of grant funds on average**. With only 85 out of 613 institutions having indirect costs below 15 percent, **a decision to cap indirect costs at 15 percent will at least halve the funds for maintaining labs for most NIH grant recipients**. If you are a grand-slam-winning tennis champion, **these indirect costs are akin to the payments for your team of coaches, strategists, medical entourage, all your equipment and access to training facilities**. Without these, **you won’t stay at number one**. It’s the same in the critical technology race. Typically, **labs and other research facilities have state-of-the-art equipment**, which have indirect costs commensurate with their level of sophistication. This means that **high-level labs**—**where breakthroughs often happen**—**have more to lose when funding is cut for indirect costs**. The biggest losers in these cuts will be **top US universities**, **medical schools and hospitals**, many of which **are among the top 10 institutions in the Tech Tracker for biotechnologies**, including MD Anderson Cancer Center, Memorial Sloan Kettering and many teaching hospitals within the Harvard Medical School. **The NIH not only provides research funding in the biomedical fields; it also has 27 biomedical research institutions**. The NIH combined is currently ranked second for vaccines and medical countermeasures and eighth for genetic engineering in the Critical Technology Tracker, highlighting its global importance and competitiveness. NIH-funded research has contributed to early detection and prevention of cancers, chemotherapy and immunotherapy. The NIH also helped develop vaccines for flu and RSV (Respiratory Syncytial Virus), as well as the mRNA Covid-19 vaccine. **These are the very institutions that the US government will rely on to develop the future vaccines needed to protect Americans from the next global pandemic**. In addition, in early February, biomedical research was again in the firing line with termination letters sent to hundreds of employees at the Centers for Disease Control and Prevention, the Food and Drug Administration, and the NIH. More job cuts are expected to follow, further weakening the sector. Around the same time, the NSF froze all grant review processes to comply with new directives to end all diversity, equity, and inclusion (DEI) programs. According to the Washington Post, NSF staff were tasked with scrutinising active research grants—preciously approved by peer review—with a list of keywords including ‘women’, ‘diverse’ and ‘institutional’ to reverse any grants remotely related to DEI initiatives. On 18 February, the haemorrhage of US S&T talent continued with a 10 percent cut to the NSF workforce. Given the NSF’s annual budget of $9 billion, the effect of this cut will be felt across all technologies. The Computer Research Association, for example, predicts devastating consequences for scientific innovation and talent in AI technologies and high performance computing, as **the NSF funds 80 percent of fundamental computing research at US institutions**. The **association credits foundational US technologies behind AI, cybersecurity and quantum technologies to NSF funding**. The Critical Technology Tracker ranks the US first in quantum computing, with seven of the top 10 institutions based in the US. However, **quantum technologies are priority areas for China, which unveiled its most advanced quantum computer**, a 504-Qubit Superconductor, **in December** 2024. In 2022, the NSF’s Directorate for Technology, Innovation and Partnerships was set up to accelerate the implementation of NSF-funded discoveries from research to new industries, especially in technologies where the US faced the greatest competition. According to Reuters, the directorate lost 20 percent of its staff last week. Similarly, **NASA**, currently ranked first in space launch systems research in the Tech Tracker, **may face a 10 percent cut to its specialised workforce**. These massive cuts have been put on hold, but if they resume, the loss of talent would be a blow to an important component of the technological race, especially with a worldwide shortage of tech specialists. Historically, **US space and satellite companies have benefited from NASA’s decades-long public investments in research and development**. The Economist reported that the scrutiny of DEI programs extended to keywords related to climate change. The National Oceanic and Atmospheric Administration (NOAA) and NASA are therefore expecting major job cuts for their work in climate science and extreme weather patterns. The NOAA plays an important role in weather prediction. Its research on space and sensors is visible in the Tech Tracker across the areas of small satellites, gravitational sensors, and sonar and acoustic sensors. **While the US is cutting its funding, China continues its systematic, long-term investment in critical technologies**. **Synthetic biology is a sector in which China has the largest lead in the Tech Tracker**. Over the past 5 years, **China has published 57.7 percent of high-impact research in the field, while the US has produced just 13.1 percent**. Synthetic biology is the design and building of new biological systems. It has applications in many areas, such as agriculture and medicine, which directly affect food security and health. **Like quantum computing, synthetic biology is an emerging technology where scientific innovation and intellectual property ownership can determine future industry dominance**. Since 2006, China has prioritised synthetic biology and built a tech ecosystem around this emerging technology, comprising research institutes and industry. As Drew Endy, a synthetic biologist from Stanford University, pointed out, the research infrastructure that China has built to support its all-of-nation approach to emerging biotechnology is now the envy of the world. The contrast between China’s investment strategy and the cuts imposed on the NIH could not be starker. **If the US doesn’t want to lose the S&T race with China, it must review its funding cuts. Reducing the funding envelope to grants organisations that oversee scientific grants, such as the NIH and NSF, will stifle the scientific innovations and breakthroughs that have been central to the rise of the US as a technology superpower**. Countries that have long relied on US technological research may need to step up spending on scientific research, or they, too, will risk being left behind.

#### **Technology will determine who wins the race. Sankowski 25**

Piotr **Sankowski**. “China Boosts Tech Budget to Rival US in Global Race.” **2025**. https://www.msn.com/en-us/money/other/china-boosts-tech-budget-to-rival-us-in-global-race/ar-AA1Akd3d. [Piotr Sankowski is a professor at the Institute of Informatics, University of Warsaw, where he received his habilitation in 2009 and where he received a doctorate in computer science in 2005. His research interest focuses on practical application of algorithms, ranging from economic applications, through learning data structures, to parallel algorithms for data science. In 2009, Piotr Sankowski received also a doctorate in physics in the field of solid state theory at the Polish Academy of Sciences. In 2010 he received ERC Starting Independent Researcher Grant, in 2015 ERC Proof of Concept Grant, and in 2017 ERC Consolidator Grant. He is a president of IDEAS NCBR – a research and development centre operating in the field of artificial intelligence and digital economy. Piotr Sankowski is also a co-founder of the spin-off company MIM Solutions.] //arrguy

**China is taking a new position in the race for technological dominance, competing with the USA.** It is set to spend enormous amounts of money on the development of AI, robotics, and 6G networks, increasing its science budget by 10% year over year to reach 398 billion yuan. **The South China Morning Post writes that this strategy could change the global balance of power. The South China Morning Post (SCMP) reports that Beijing has intensified the "technological arms race," increasing science funding by 10% for the second consecutive year.** By 2025, 398 billion yuan (54 billion USD) will be allocated. These figures are outlined in the Chinese Ministry of Finance's budget proposal, presented on Wednesday. **Under the category of "science," the funding is directed toward advancements in artificial intelligence, humanoid robots, and 6G networks.** SCMP reports that the integration of these technologies has the potential to reshape the global balance of power. China heavily invests in science **The English-language newspaper based in Hong Kong emphasizes that this is a clear signal that Beijing aims to dominate future technologies. This is part of a strategy to help China win the competition with the United States and transform the global technological power balance.** Renogy 2000W Pure Sine Wave Inverter Charger 12V To 120V AC Surge 6000W Off-Grid Solar Inverter Charger For RV Boat Home W/LCD Display, Auto This strategy includes attracting global talent and systematically investing in future technologies. China's increase in science expenditures is the largest among all categories of government spending, surpassing diplomacy, public safety, education, and defense. The US and China participate in a new "arms race" At the end of January, the Bank of China presented an "Action Plan to Support the Development of the Artificial Intelligence Industry Chain." Over the next five years, at least 1 trillion yuan (about 130 billion USD) will be allocated to provide financial support to AI-related entities. This will benefit technology sector leaders, including Huawei, Tencent, Baidu, and iFlytek, as well as key governmental and research institutions.

#### **Decline causes transition wars and lashout. Kim 19**

**Kim 19** [Min-Hyung Kim, Department of Political Science and International Relations, Kyung Hee University, Seoul, South Korea, 2-4-2019, A real driver of US–China trade conflict: The Sino–US competition for global hegemony and its implications for the future, No Publication, https://www.emerald.com/insight/content/doi/10.1108/itpd-02-2019-003/full/html, accessed 2-11-2025.] //aayush

Since the end of the Second World War, **the USA has undoubtedly been a global hegemon**. With its preponderant military and economic strength, it has created a liberal international economic order and maintained it by promoting global free trade. **USA sudden turn to protectionism under the banner of “America First” in the Trump administration illustrates “US fear” that its hegemony or Pax Americana is declining vis-à-vis China’s growing power**. It also demonstrates that **the USA now seeks to deter China from overtaking its hegemony so as to keep US hegemony as long as possible**. Currently, the USA and China are waging a trade war. What is important to note here is that **the driving force of the trade war between the world’s two largest economies is more political than economic**. That is to say, **as China’s economic and political influence in the world vis-à-vis that of the USA increases, US fear about China’s power also grows. Under these circumstances, Washington makes every effort to assert its global dominance by deterring China’s challenge to its hegemony**[13]. **It is this** sort of “US **fear**” **about hegemonic power transition from Washington to Beijing that brought about US policies against the BRI, the AIIB, and Made in China 2015**. The fear of hegemonic power transition is indeed a **driving force for the US-launched trade war**. Understood this way, **the trade war between the USA and China may be a harbinger of a much larger-scale conflict between the two parties**, since as PTT predicts, **war is more likely to occur when the power gap between a declining hegemon and a rising challenger is getting closed**. **As China’s economic**, technological, military **and political rise continues down the road, the USA will try to contain it in order to maintain its global hegemony**. The obvious consequence of this seesaw game is the **intensification of the Sino–US competition over global hegemony**. The USA and China, the two most powerful states in the world, **appear as if they were on a collision course.** What this means is that **so long as US fear about China’s overtaking US hegemony persists, a similar type of conflict between the two hegemonic powers is likely to occur in the future** even if the current trade war is over.

#### **That’s devastating. Payne 16**

**Payne 16** [Dr. Keith B. Payne, 7-5-2016, Keith B. Payne is the president of National Institute for Public Policy, head,&nbsp;Graduate Department&nbsp;of Defense and Strategic Studies, Missouri State University (Washington area campus) and a former deputy assistant secretary of defense, "Payne, Keith B., Once Again: Why a “No-First-Use” Policy is a Bad, Very Bad Idea", No Publication, https://web.archive.org/web/20200916183043/https://www.nipp.org/2016/07/05/payne-keith-b-once-again-why-a-no-first-use-policy-is-a-bad-very-bad-idea/, accessed 8-26-2023.] //aayush

A US NFU policy would be particularly dangerous at a time when both Russia and China may be armed with chemical and biological weapons and are pursuing expansionist policies in Europe and Asia, respectively, to overturn the status quo.[3] **Russia is by far the strongest military power in Europe**. It has moved repeatedly against neighboring states since 2008, forcibly changing established borders in Europe for the first time since World War II and issuing explicit nuclear first-use threats in the process. Only several months ago, Russia reportedly rehearsed the invasion of Norway, Finland, Sweden and Denmark in a military exercise involving 33,000 troops.[3] **In Asia, China is the strongest military power** and is expanding its reach against US allies, including by building and militarizing islands in the South China Sea. **At a time when key US allies face unprecedented threats from powerful neighbors**, the US should not reduce the calculation of risks Russia and China must confront in their respective expansionist drives by adopting a US NFU policy. Indeed, saying so should be considered a breathtaking understatement in **a world in which aggressors still exist, as do advanced conventional, chemical and biological weapons, and another world war using “only” such modern non-nuclear weapons could cause death levels far beyond the 80-100 million souls lost** in World Wars I and II.

## **Contention 2 is Meltdown.**

#### **Meltdown is inevitable — it’s only a matter of time. Fox 24**

**Fox**, Audrey. “Is Nuclear Power Bad for the Environment?” Friends of the Earth, August 19, **2024**. https://foe.org/blog/is-nuclear-power-bad-for-the-environment/. [Audrey Fox is the digital communications manager at Friends of the Earth. She manages the organization’s websites, produces social content for the organization, tracks and analyzes metrics, and coordinates between the communications and campaign teams. She additionally assists with the production of multimedia content. Previously, she served as the organization’s communications intern, assisting the team with media outreach, social media, copy editing, and rapid response. Audrey holds a B.A. in Political Science and Communications with a specialization in Environmental Science from the University of California, San Diego. Outside of work, she enjoys skiing, hiking, biking, and watching Giants baseball.] //MH

**Nuclear Hazards – Safety and Health Nuclear disasters serve as prescient reminders of the unimaginable dangers of nuclear power. They may be caused by human error, mechanical failures, and/or natural disasters.** The Chernobyl disaster in Ukraine in 1986 remains the worst nuclear accident in history. It will take at least 3,000 years for the area surrounding the nuclear power plant to be habitable. The second worst nuclear accident occurred in 2011 after an earthquake and tsunami struck the Fukushima Daiichi Nuclear Power Station in Japan, causing all three operating reactors to melt down. The Three Mile Island Generating Station in Pennsylvania experienced a partial meltdown in 1979, leading to increases in cancer and other diseases. The worst radiation disaster in U.S. history is the Church Rock uranium spill, which occurred on the Navajo Nation a few months after Three Mile Island. Nuclear accidents pose extreme threats to life and have forced abandonment of wide swaths of land. Health impacts include increased risk of different types of cancer, immune deficiencies, infant mortality and birth defects, acute radiation syndrome (radiation poisoning), and harms to mental health. Those who mine and mill uranium and who work at nuclear power plants also face higher risk of diseases such as cancer. **The U.S. nuclear fleet is old, with an average age of 42 years. Aging infrastructure is more prone to cracks, corrosion, and other compromises in safety.** Nuclear power stations are also vulnerable to military strikes and threats of terrorism. Further, the technologies required to make nuclear energy are also the technologies required to make nuclear weapons, raising the risk of nuclear proliferation.

#### **The risk is peaking now. Dinneen 24**

James **Dinneen**. “Can Aging U.S. Nuclear Power Plants Withstand More Extreme Weather?” Yale E360, **2024**. https://e360.yale.edu/digest/u.s.-nuclear-power-climate-change. [Yale Environment 360 is an online magazine offering opinion, analysis, reporting, and debate on global environmental issues. We feature original articles by scientists, journalists, environmentalists, academics, policymakers, and business people, as well as multimedia and a daily digest of major environmental news.] //MH

To reach its climate goals, the Biden administration aims to extend the lives of U.S. nuclear reactors. But a new report finds regulators have not studied whether increasingly extreme weather could threaten the safety or viability of power plants largely built in the 1970s and 1980s. On August 10, 2020 a powerful derecho windstorm blasted the Duane Arnold nuclear power plant in Iowa. Up to 130 mile-per-hour winds caused a power outage and knocked over the 50-year-old plant’s wooden cooling towers, which triggered an automatic shutdown of the reactor and a switch to backup generators to power its cooling system. The U.S. Nuclear Regulatory Commission (NRC) concluded the plant’s multiple layers of defense had avoided any risk of releasing radioactive material, but the reactor was never restarted. The plant had been slated to close, and its owner decided not to repair the damage. “A weather-related event prematurely and permanently shut down the Duane Arnold,” says Jeff Mitman, a nuclear risk consultant and a former NRC engineer now involved in a campaign to highlight safety risks at aging nuclear plants. He points to Duane Arnold as an example of how such plants can be vulnerable to extreme natural hazards that may be exacerbated by climate change. The country’s 54 nuclear power plants still in operation were designed to be resilient to numerous outside threats, including the most extreme weather-related events deemed feasible based on the historical record, and even beyond. **But most plants were built more than 40 years ago, and a new investigation finds these plants may yet be vulnerable to unprecedented hazards fueled by climate change, at a time when many experts say nuclear power is needed to keep emissions from fossil fuels in check. According to the report released earlier this month by the U.S. Government Accountability Office (GAO), the investigative arm of Congress, every nuclear plant in the country is located in an area where climate change is set to worsen flooding, heat, storms, wildfires, extreme cold, or some combination. However, it found that the NRC — which is responsible for U.S. nuclear safety — has not conducted the analyses necessary to know whether nuclear power plants are prepared for those changing conditions.** The report did not demonstrate that any plants are necessarily vulnerable to these hazards, which would require a plant-by-plant analysis. But it found the NRC has not adequately addressed whether more extreme weather could force plants to shut down or lower power output more frequently, or pose a safety risk.

#### **Affirming solves through upgrades. Tariq 24**

**Tariq**, Ehtesham. “Costs and Benefits of Extending Aging Nuclear Power Plants | Certrec.” Certrec | Regulatory & Technology Solutions for the Energy Industry, December 2, **2024**. https://www.certrec.com/blog/costs-and-benefits-of-extending-aging-nuclear-power-plants/. [Certrec is a leading provider of regulatory compliance and digital integration solutions for the energy industry, with the mission of helping ensure a stable, reliable, bulk electric supply. Since 1988, Certrec’s innovation combined with industry expertise has helped hundreds of power-generating facilities manage their regulatory compliance with both the Nuclear Regulatory Commission (NRC) and North American Electric Reliability Corporation (NERC) and reduce their risks.] //MH

For several decades, nuclear power plants worked as a cornerstone of global energy strategies, providing reliable and carbon-free electricity to millions in the U.S. However, as many nuclear reactors approach the end of their initial design lives, questions arise about whether to decommission them or extend their operational lifespan. Aging nuclear power plants, though still a vital asset in many energy grids, face mounting challenges that require careful consideration. Extending the life of aging nuclear power plants involves a complex evaluation of costs, safety considerations, technological advancements, and socio-economic benefits. This decision-making process carries immense implications for energy security, climate goals, and financial investments. The Economic Rationale for Life Extension Projects The economics of extending the operational life of aging nuclear reactors is one of the primary drivers behind life extension projects. **Constructing new nuclear plants is a capital-intensive endeavor, often requiring billions of dollars and spanning a decade or more. In contrast, extending the life of an existing plant through life management programs, such as refurbishment and equipment upgrades, generally costs significantly less.** According to the International Atomic Energy Agency (IAEA), life extension projects can cost 25–50% of the expenses of building a new plant, making them a cost-effective solution for maintaining energy supply. Operational costs are another favorable factor. Aging nuclear plants often operate at lower marginal costs than alternative energy sources, especially fossil fuels. **With upgrades in key systems, such as steam generators, turbines, and safety measures, older plants can achieve higher efficiencies, further driving down costs.** However, these financial benefits come with upfront investments in safety assessments, regulatory compliance, and infrastructure modernization to meet evolving industry standards. Safety Upgrades and Regulatory Challenges Safety is paramount in any discussion about extending the lifespan of nuclear power plants. **Aging infrastructure poses increased risks, necessitating comprehensive safety evaluations and enhancements. Life extension projects typically involve extensive inspections, including assessments of reactor pressure vessels, containment systems, and cooling mechanisms to identify potential vulnerabilities.** Advanced nondestructive testing methods are often employed to detect micro-cracks, corrosion, and material degradation that might compromise safety during extended operations. Meeting regulatory requirements from the Nuclear Regulatory Commission (NRC) presents additional challenges. Governments and nuclear safety agencies like the NRC require rigorous assessments to ensure that extended operations do not compromise public health or the environment. This involves implementing post-Fukushima safety measures, such as improved flood protection, enhanced seismic resilience, and backup power systems. These safety upgrades, while necessary, can significantly increase the costs and time required for life extension projects. Social and Energy Security Implications The socio-economic and energy security implications of extending the life of nuclear plants are profound. **These plants provide thousands of high-paying jobs, from engineers and technicians to plant operators and support staff.** Life extension projects, which require extensive maintenance and upgrades, often create additional employment opportunities in the local community. On the energy security front, extending nuclear plant operations reduces dependence on imported fossil fuels and mitigates price volatility in energy markets. Countries with aging nuclear fleets, such as the United States, France, and Canada, view life extension as a strategic move to maintain energy independence and secure supply chains. Conclusion The decision to extend the life of aging nuclear power plants is a multifaceted challenge involving economic, technical, environmental, and social considerations. While life extension offers significant benefits, including cost savings, enhanced energy security, and climate mitigation, it also demands substantial investments in safety upgrades, regulatory compliance, and public trust. By balancing these factors and leveraging advancements in nuclear technology, nations can ensure the safe and sustainable operation of nuclear power plants, paving the way for a cleaner and more secure energy future.

#### **Replacements too. Fristch 24**

David **Fritsch**, Office of Nuclear Energy. “8 Things to Know about Converting Coal Plants to Nuclear Power,” **2024**. https://www.energy.gov/ne/articles/8-things-know-about-converting-coal-plants-nuclear-power. [The Office of Nuclear Energy works to advance nuclear energy science and technology to meet the nation's energy, environmental, and economic needs.] //MH

Nearly 30% of the nation’s coal-fired power plants are projected to retire by 2035 as states continue to prioritize a shift toward cleaner energy sources. But with power demands expected to rise due to the electrification of more cars, appliances, and processes, something must help fill the void. The U.S. Department of Energy (DOE) projects we’ll need an additional 200 gigawatts (GW) of nuclear capacity to reach net-zero emissions by 2050 and some of that could take place at or near retiring coal plants — creating new job and economic opportunities for these energy communities. Here are 8 things you should know about transitioning coal stations to nuclear power plants. **1. The Majority of U.S. Coal Plants Could Be Converted A 2022 DOE report found that more than 300 existing and retired coal power plant sites are suitable to host advanced nuclear power plants. Each plant could match the size of the site being converted and help increase nuclear capacity by more than 250 GW—nearly tripling its current capacity of 95 GW.** 2. Coal to Nuclear Transitions Could Preserve and Create New Jobs According to the same study, employment in the region associated with an incoming nuclear plant could increase by more than 650 permanent jobs spread across the plant, supply chain, and surrounding community. Occupations seeing the largest gains include nuclear engineers, security guards, and nuclear technicians. The plants could also leverage the existing coal plant workforce in the community to help transition their current skills and knowledge to work in nuclear energy with wages that are typically 50% higher than those of other energy sources. **3. Converting Coal Plants to Nuclear Could Drive Economic Growth The study also indicates that long-term job impacts of a converted coal to nuclear power plant could lead to additional annual economic activity of $275 million. This includes a 92% increase in tax revenue from the new nuclear plant for the local county when compared to prior tax revenue from a coal plant.** These tax payments would also increase the amount of money available to improve local schools, infrastructure projects, and public services. **Additional benefits would also be distributed throughout the community as the wages from good-paying nuclear energy jobs lead to increased household spending. Local businesses may also benefit as suppliers of goods and services in support of plant operations, while others may benefit from increased household spending in the community.** 4. Coal to Nuclear Transitions Could Bring Environmental Benefits According to the U.S. Energy Information Administration, coal plants account for 20% of the nation’s total energy-related carbon dioxide emissions. Replacing unabated coal combustion with fission, a physical process that doesn’t emit carbon, would dramatically reduce green gas emissions in the energy sector. It would also directly improve the air quality in the region by avoiding other harmful byproducts produced by fossil fuel plants that are linked to asthma, lung cancer, and heart diseases — helping to improve the over health of the community. 5. Converting Coal Plants to Nuclear Could Save on New Construction Costs The DOE report also found that new nuclear power plants could save up to 35% on construction costs depending on how much of the existing site assets could be repurposed from retired coal power plants. These assets include the existing land, the coal plant’s electrical equipment (transmission connection, switchyard, etc.) and civil infrastructure, such as roads and buildings.

#### **This is the most probable implementation.**

**1.** **It’s cheaper — that aligns with Trump’s agenda of limiting government involvement in the economy.**

**2.** **No need for new land — that avoids a lengthy permitting process and eminent domain lawsuits.**

**3.** **It’s a smaller adjustment — that takes less political capital and public support.**

**4.** **Political incentive — Republicans wants to reap tangible benefits before the next election cycle so will prioritize a quicker project.**

#### **America needs to be the leader in nuclear energy. Sallee 21**

Kyle **Sallee**, American University. “Regaining American Competitiveness in the Global Nuclear Power Market,” **2021**. https://www.american.edu/sis/centers/security-technology/regaining-american-competitiveness-in-the-global-nuclear-power-market.cfm. [Currently, I study US foreign policy and national security at the American University School of International Service as a Master's Degree student. My focus includes US nuclear policy and security strategies within the post-Soviet space.] //MH

‌The US Department of Energy’s “Strategy to Assure U.S. National Security” is abundantly clear; America has relinquished its competitive global position as the world leader in nuclear energy to Russian and Chinese state-owned enterprises (SOE). The United States is missing out on a multi-billion-dollar export market, has nearly lost its domestic uranium mining capabilities, relies heavily on an aging domestic reactor fleet, and faces a crippling exodus of retiring nuclear policy experts and engineers. Estimates from the US Department of Commerce project that the United States is absent from a global nuclear reactor market valued at $500-740 billion over the next decade. Meanwhile, Russian SOE, Rosatom, is advancing its nuclear influence globally with $133 billion in foreign orders for reactors, planning to underwrite the construction of over 50 reactors in 19 countries. The China National Nuclear Corporation (CNNC), a strategic competitor, is constructing four reactors abroad, with prospects for 16 more. **The absence of the US from the global nuclear reactor market is economically significant, but the foreign policy implications of the American withdrawal are even more alarming. The absence of a robust US nuclear energy exports market erodes American credibility as the arbiter of global nuclear norms – the guidelines that ensure safe nuclear energy generation and exports.** Beginning with President Dwight Eisenhower’s “atoms for peace” framework (1953), the US leveraged its dominance of the global nuclear exports market to shape international nuclear governance through the Cold War. The International Atomic Energy Agency (IAEA), which develops international nuclear safety standards, and the Nuclear Suppliers Group (NSG), which coordinates members’ export control policies, both resulted from critical US leadership. The waning US nuclear exports market leaves American officials orchestrating nuclear regulatory policy without a tangible stake in the market and forfeiting valuable foreign policy opportunities. The vacuum left by the US withdrawal from the global nuclear energy market presents new foreign policy openings for its rivals. Rosatom is piloting its “Build-Own-Operate,” or BOO model in Turkey, which offers Russian state-backed financing for the construction of a nuclear reactor in exchange for control of its energy dispersal. In China, CNNC has expressed interest in similar quid-pro-quo structures. Beyond financing, reactor exports allow countries to form 100-year strategic relationships that can span construction, operation, and decommissioning of nuclear reactors and then influence a client’s nuclear regulations. These relationships are already being cultivated by Rosatom and CNNC across Asia, Eastern Europe, and South America. **Exporting nuclear technology is an opportunity to lead in the global marketplace, ensure US authority in international nuclear governance, and form new strategic partnerships.** The incoming Biden Administration has inherited a US nuclear industry in disarray that faces substantial international competition from Russia and China. **To regain its lead in the global nuclear exports market, the US must act quickly and deliberately.** The following identifies the advantages of US competitors and proposes immediate actions to bolster the American nuclear industry.

#### **Investment means improvement — solves the neg and outweighs on scope. Rehm 23**

**Rehm 23** [Thomas E Rehm, American Institute of Chemical Engineers, 3-xx-2023, Advanced nuclear energy: the safest and most renewable clean energy, No Publication, https://www.sciencedirect.com/science/article/abs/pii/S2211339822000880, accessed 3-10-2025.] //aayush

**Although legacy nuclear energy has been the safest form of electricity generation, it has been demonized** as unsafe since the 1960s. The three well-known **nuclear accidents**, Three Mile Island, Chernobyl, and Fukushima, **were legacy nuclear designs**. **Even with the best safety record of all types of electricity generation, it is time to move away from legacy nuclear to reap the benefits of a truly renewable source of safe clean energy, advanced nuclear**. Solar and wind cannot hold a renewable candle to the vast renewable potential of advanced nuclear energy. **The transition to carbon-neutral energy can best be made with advanced nuclear, in safety, waste minimization, true renewability for thousands of years, process heat for manufacturing, and a viable means of replacing our chemical manufacturing dependence on fossil fuels**. Some of my colleagues tell me, “There are few opportunities for chemical engineers in nuclear”. I disagree. **Opportunities include design and operation of high-temperature (550–750 °C) plants involving molten salts, liquid metal, and helium; application of this high-temperature capability for industrial process heating; recycling legacy nuclear ‘waste’ to provide fuel for advanced reactors; integration of the hydrogen economy into nuclear plant design and operation; improvement in moving pebble-bed advanced reactor technology; mining improvements for uranium and thorium, including mining uranium from seawater; molten salt storage systems for improving load following functionality and to provide process heat functionality; resolving corrosion challenges in molten salt reactors; and retrofitting existing oil-and-gas-based refineries to operate as nuclear biorefineries**.

#### **Otherwise, meltdown is devastating. Lendman 11**

**Lendman 11** [Stephen Lendman 3-13-11, research associate of the Centre for Research on Globalization. “Nuclear Meltdown in Japan.” 3-13-2011. http://www.thepeoplesvoice.org/TPV3/Voices.php/2011/03/13/nuclear-meltdown-in-japan]

Reuters said the 1995 Kobe quake caused $100 billion in damage, up to then the most costly ever natural disaster. This time, from quake and tsunami damage alone, that figure will be dwarfed. Moreover, **under a worst case core meltdown, all bets are off as the entire region and beyond will be threatened with permanent contamination**, making the most affected areas unsafe to live in. On March 12, Stratfor Global Intelligence issued a "Red Alert: Nuclear Meltdown at Quake-Damaged Japanese Plant," saying: Fukushima Daiichi "nuclear power plant in Okuma, Japan, appears to have caused a reactor meltdown." Stratfor downplayed its seriousness, adding that such an event "does not necessarily mean a nuclear disaster," that already may have happened - the ultimate nightmare short of nuclear winter. According to Stratfor, "(A)s long as the reactor core, which is specifically designed to contain high levels of heat, pressure and radiation, remains intact, the melted fuel can be dealt with. If the (core's) breached but the containment facility built around (it) remains intact, the melted fuel can be....entombed within specialized concrete" as at Chernobyl in 1986. In fact, that disaster killed nearly one million people worldwide from nuclear radiation exposure. In their book titled, "Chernobyl: Consequences of the Catastrophe for People and the Environment," Alexey Yablokov, Vassily Nesterenko and Alexey Nesterenko said: "For the past 23 years**, it has been clear that there is a danger** **greater than nuclear weapons** **concealed within nuclear power. Emissions from this one reactor exceeded a hundred-fold the radioactive contamination of the bombs dropped on Hiroshima and Nagasaki."** "No citizen of any country can be assured that he or she can be protected from radioactive contamination. **One nuclear reactor can pollute half the globe.** Chernobyl fallout covers the entire Northern Hemisphere." Stratfor explained that if Fukushima's floor cracked, "it is highly likely that the melting fuel will burn through (its) containment system and enter the ground. This has never happened before," at least not reported. If now occurring, "containment goes from being merely dangerous, time consuming and expensive to nearly impossible," making the quake, aftershocks, and tsunamis seem mild by comparison. Potentially, **millions of lives will be jeopardized**. Japanese officials said Fukushima's reactor container wasn't breached. Stratfor and others said it was, making the potential calamity far worse than reported. Japan's Nuclear and Industrial Safety Agency (NISA) said the explosion at Fukushima's Saiichi No. 1 facility could only have been caused by a core meltdown. In fact, 3 or more reactors are affected or at risk. Events are fluid and developing, but remain very serious. **The possibility of an extreme catastrophe can't be discounted.** Moreover, independent nuclear safety analyst John Large told Al Jazeera that by venting radioactive steam from the inner reactor to the outer dome, a reaction may have occurred, causing the explosion. "When I look at the size of the explosion," he said, "it is my opinion that there could be a very large leak (because) fuel continues to generate heat." Already, Fukushima way exceeds Three Mile Island that experienced a partial core meltdown in Unit 2. Finally it was brought under control, but coverup and denial concealed full details until much later. According to anti-nuclear activist Harvey Wasserman, Japan's quake fallout may cause nuclear disaster, saying: "This **is a very serious situation. If the cooling system fails** (apparently it has at two or more plants**),** **the super-heated radioactive fuel rods will melt, and (if so) you could conceivably have an explosion**," that, in fact, occurred. As a result, **massive radiation releases may follow, impacting the entire region. "It could be**, literally, **an apocalyptic event. The reactor could blow." If so, Russia, China, Korea and most parts of Western Asia will be affected. Many thousands will die, potentially millions under a worse case scenario, including far outside East Asia.**

## **Rebuttal**

**NA 24** [National Academies Of Sciences, Engineering, and Medicine, The National Academy of Sciences was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president. The National Academy of Engineering was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. John L. Anderson is president. The National Academy of Medicine (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president. The three Academies work together as the National Academies of Sciences, Engineering, and Medicine to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The National Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine, 2024, Nuclear Terrorism: Assessment of U.S. Strategies to Prevent, Counter, and Respond to Weapons of Mass Destruction, National Academies Press, https://nap.nationalacademies.org/catalog/27215/nuclear-terrorism-assessment-of-us-strategies-to-prevent-counter-and, accessed 3-20-2025.] //aayush

**Are U.S. efforts to counter nuclear or radiological1 terrorism keeping pace with the evolving threat landscape?** Almost twenty years after the release of “The 9/11 Commission Report,” **the unanimous conclusion of the National Academies Committee members who have prepared this study report is that, overall, they are not**. The **nightmare scenario of a terrorist nuclear attack on U.S. soil is a risk that has not diminished**. The **efforts to manage this risk must be expanded and they must be enduring. Success has the potential to breed complacency**. The significant **attention paid to preventing terrorism in the aftermath of the 9/11 attacks and the success of the U.S programs to reduce the terrorism risk has made it possible for a new generation of Americans to grow up without experiencing a catastrophic terrorist attack** on the U.S. homeland. **The downside of this achievement is that**, not having had a major shock or crisis that provides confirmation that a threat is clear and present, **the nation’s attention has started to drift**. This loss of focus, as it has in the past, can be expected in the future to translate into waning interest and investment in capabilities that are required to prevent, detect, deter, respond to, and recover from a future catastrophic terrorist event. In the decade **prior to Russia’s 2022 invasion of Ukraine, most Americans paid little attention to the nuclear terrorism threat**. The **capture of the Zaporizhzhia Nuclear Power Station and Vladimir Putin’s nuclear saber rattling placed the nuclear risk back in the headlines. This has not, however, resulted in renewed attention to nuclear terrorism**. Instead, **it has contributed to the accelerated shift in focus by the national security community to Great Power Competition with Russia and China**. **Preventing terrorist attacks**, and effectively responding to and recovering from incidents when they occur, **requires vigilance and sustained effort**. The sophisticated counter-terrorism intelligence and military capabilities developed after the attacks of September 11, 2001, require continuous attention to ensure the necessary levels of interagency coordination and international, state, and local engagement. But **challenges presented by state actors are now being prioritized over those posed by non-state actors**. While this may be understandable given the rapidly changing threat environment, **it risks the erosion of efforts that have worked to date in preventing terrorist groups from obtaining or building and deploying a nuclear or radiological device**. A cautionary tale for current times is what happened to U.S. counterinsurgency capabilities in the immediate **aftermath of the Vietnam War**. During that conflict, the U.S. **military services developed special forces that were highly capable of conducting joint special operations deep inside North Vietnam** (Atlamazoglou 2020). **When the war ended in 1975**, however, **there was a significant reduction in defense spending along with a shift by the armed services in training and strategic focus to conventional warfighting to counter the Soviet Union**. Mission planning and interservice operability for conducting special operations degraded. The **tragic consequence of this played out in April 1980 with the catastrophic failure of Operation Eagle Claw**. **President** Jimmy **Carter had authorized a military rescue attempt of the 52 American diplomats and citizens taken hostage after the Iranian takeover of the U.S. Embassy in Tehran**. The U.S. Army, Navy, Air Force, and Marines were all involved in the operation, but **only five of eight helicopters arrived at the staging area in operational condition and then one of the remaining helicopters crashed into a transport aircraft, destroying both aircraft and killing eight servicemen**. (Kyle and Eidson 2002; Williamson 2020). The **operation** was then **aborted**. The postmortem investigation concluded that “**a lack of coordination between military services—evidenced in part by compartmentalized training and inadequate equipment maintenance**” **contributed to the aborted operation** (Lambert 2023). The failure of Operation Eagle Claw2 **illustrated how quickly “procedural memory” and defense competencies can fade once new priorities consume most of the funding and focus**. This committee is concerned that **history may repeat itself**, this time **with respect to our counterterrorism capabilities**. Fortunately, there are many dedicated people across the U.S. government who have been involved in and continue to support the successful management of the nuclear terrorism risk. These dedicated individuals recognize the imperative for sustaining capabilities and regular exercising of the capabilities needed to counter the risk. All presidents since President Clinton have made confronting the threat of nuclear terrorism a top strategic priority. Most recently, in March 2023, President Joe Biden signed National Security Memorandum 19 (NSM-19) on “Counter Weapons of Mass Destruction Terrorism and Advance Nuclear and Radioactive Material Security” (The White House 2023). In a meeting to coincide with the release of NSM-19, Dr. Elizabeth Sherwood- Randall, the assistant to the president for homeland security, traced the decades-long bipartisan history of confronting this risk that predates the Cold War but expanded rapidly at its end. She emphasized the Cooperative Threat Reduction (CTR) program, created by the 1991 Nunn-Lugar Act. CTR was instrumental in helping to secure and dismantle significant numbers of weapons of mass destruction and their delivery systems, secure fissile materials, and support nonproliferation programs in Russia and the states of the former Soviet Union (Bernstein and Wood 2010). Had this not been done, Soviet nuclear weapons, materials, and expertise may have ended up in the hands of rogue actors. Dr. Sherwood-Randall also discussed the challenge of addressing the decrease in high-level political attention coincident with the collective success of nuclear security. In addition, she noted that “**though countering terrorism has been a top priority for the United States for more than two decades, the terrorist threat has evolved** […] It’s become more ideologically diffuse, and geographically diverse” (Johnson, 2023). This committee embraces Dr. Sherwood-Randall’s admonition that “the **Nation cannot lapse in this no-fail mission where the consequences are so high**.” Nuclear terrorism represents a uniquely consequential threat to the United States and the entire global community that is domestic, international, and transnational. This reality makes the need for sustained U.S. leadership in addressing the ongoing nuclear terrorism threat a critical national priority. This report provides a number of findings and recommendations that support existing programs but also notes where more needs to be done and where U.S leadership is indispensable. The committee members are hopeful that Congress and the American people will take these recommendations to heart and implement them. **The stakes involved with getting this right could not be higher**. As mentioned previously, the committee’s concerns are increasing, this time with respect to the United States’ counterterrorism capabilities as events evolved while this report was under review. The **persistence of the terrorism threat and its capacity to be a destabilizing geopolitical force was once again highlighted by the October 7, 2023, attacks by Hamas** on Israel that killed 859 Israeli civilians and at least 345 Israeli soldiers and police officers, and the taking of over 240 hostages. The attacks also **demonstrated the blurred line between state and nonstate actors, given Hamas’s role as a governing organization in the Gaza Strip and the support it has received from Iran and Gulf States** (Boxerman 2023; Fabian 2023a, 2023b, 2023c).

1. Terrorism is non unique

**Kaplan 25** [Adiel Kaplan, Kenzi Abou-Sabe and Dan De Luce, 1-4-2025, "‘A perfect storm’: Extremism online and political polarization are increasing risk of attacks, experts say", NBC News, [**https://www.nbcnews.com/investigations/online-extremism-political-polarization-us-attacks-threat-rcna186017**](https://www.nbcnews.com/investigations/online-extremism-political-polarization-us-attacks-threat-rcna186017)] //bid daddy yerg

**The ISIS-inspired attack in New Orleans underscores how extremism online and political divisions at home have created “a perfect storm” for radicalization in America,** experts say, with law enforcement struggling to track an increasingly fractured threat. **Finding and accessing extremist communities online has never been easier, the threat has never been higher, and the ideology of those carrying out attacks has never been more splintered**, according to the experts. “What the FBI and law enforcement in general are dealing with right now is a threat landscape that is both diverse and complicated,” said Seamus Hughes, a senior researcher and policy associate with the National Counterterrorism Innovation, Technology, and Education Center at the University of Nebraska Omaha. “That makes things a little harder for law enforcement.” “**We have a level of polarization in the U.S. that’s an important factor,” he said. “The online environment has algorithms that are set up to make you angry. And all that is playing into a perfect storm of factors that are leading to an increase in radicalization.**” According to the federal government, **the main terror threat to the U.S. now is lone actors inspired by extremism ideology**. Those ideologies range widely. The majority of attackers are on the far right, as in the 2022 Buffalo supermarket shooting. But sometimes, as in the New Orleans attack, **the driving ideology is radical Islamism**. Occasionally, it’s far-left or anti-Trump, as in the 2017 attack on Republican members of Congress and staffers at a baseball practice outside Washington and the apparent assassination attempt of Trump in Florida last year, or at other times a mix of ideologies, what FBI Director Christopher Wray has called “salad bar extremism.”

Dirty bombs are impractical.

**Neuhauser 16** [Neuhauser, Interviewing Toby & Acton, 16 Alan Neuhauser, Staff Writer. James Acton, a director of the Nuclear Policy Program at the Carnegie Endowment for International Peace. William Tobey, a former deputy administrator at the National Nuclear Security Administration. [How Real Is the Dirty Bomb Threat? 3-24-2016, <https://www.usnews.com/news/articles/2016-03-24/how-real-is-the-dirty-bomb-threat>] //bid daddy yerg

How about from a nuclear power plant? **It's** **not easy** **at all**. "People have a view of there being all this nuclear material just floating around at nuclear power plants and people being able to steal them," Acton, of the Carnegie Endowment, says. That's just not true. **Nuclear** **fuel**, before it's used, is not very radioactive – it **would need** **to be** **enriched** to make a nuclear bomb, **a highly complex and delicate** **process**, **and** it also **doesn't have enough radioactivity** to make an effective dirty bomb. **The** **waste** that emerges after nuclear fuel is burned **is** **highly radioactive –** **so potent**, in fact, that **it's** known as **"self-protecting":** **It would** **kill anyone trying to steal** **it.** **It's** also **"physically** **huge,"** Acton says. **"Fuel bundles are enormous.** The **idea** that terrorists are going to get their hands on spent nuclear fuel **is** **very, very** **unlikely."** **Terrorists could**, however, **try to cause a meltdown**. Reactors need constant cooling, and meltdowns happen when those systems fail and the nuclear core overheats. Power plants are built with redundancies and "concentric circles of probability" to prevent that from happening, says Tobey, now a senior fellow at Harvard's Belfer Center for Science and International Affairs. The problem, he adds, is "terrorists don't respect the laws of probability, they work to overcome them." Take the meltdown at Japan's Fukushima Daiichi plant in 2011, for example: There were generators in place to keep power flowing to the site's cooling systems. But they were located at low elevations – when the tidal wave struck, the generators went down with the rest of the plant. "If a terrorist is going to attack a nuclear power facility, that terrorist would probably understand the need to attack more than one line of defense," Tobey says. And **with plants protected by** **cameras,** **walls** **and** **well-armed** **guards**, it would take far more than just one bomb or a simple attack to trigger meltdown – **making** **the chances** **it could happen** **highly unlikely**. So how worried should we be? For one, **a** **dirty bomb is** **far** **less destructive** than a nuclear weapon, at least in terms of the loss of life. **"It's** **very** **hard to kill lots** **of people with radioactivity," Acton says.** "What the radioactivity will do is contaminate a larger area, so you will have large amounts of lost economic activity from an area, you would have a horrible cleanup operating. It can inflict huge costs and disruption. But it's hard to kill large numbers of people with radioactive. The nation's nuclear plants and labs may be perennial targets of terrorists groups, but **the** **risk of** **radiological** **theft** **or** **of** **sabotage is low**. Outside those highly guarded facilities, however, the security picture is far different:

1. Attacks have never happened before despite decades of nuclear-related systems. Be skeptical that now is key: “cutting-edge tech” rhetoric has been used for decades without an attack.
2. It’s impractical.

**NEI ND** [Nuclear Energy Institute, Nuclear industry trade association in the United States, based in Washington, D.C, xx-xx-xxxx, Security, https://www.nei.org/fundamentals/safety/security., accessed 3-14-2025.] //aayush

**Is Nuclear Energy Safe From Physical Attacks? Yes. The nuclear energy industry is one of the nation’s most well-defended critical infrastructures. Nuclear reactors are protected by steel-reinforced concrete, several feet thick, with a steel liner**. The **reactor vessel is made of steel about 6 inches thick**. Reactors are **housed in steel-reinforced concrete containment structures that are designed to withstand natural disasters**, including hurricanes, tornadoes, earthquakes and floods. **The containment building is so durable it can survive direct impact from a jet airliner**. Nearly **9,000 well-armed and highly trained security officers—many of which come from prior law enforcement and military backgrounds—protect our nuclear plants**. The NRC inspects each plant’s protective strategy at least once every three years with a “force-on-force” exercise, in which mock adversaries attempt to penetrate a plant’s defenses and the plant’s security force must respond. **The NRC also conducts numerous other security inspections on various layers of security elements and programs.** Is Nuclear Energy Safe From Cyberattacks? **Nuclear facilities protect their critical systems from cyberthreats with advanced measures.** Nuclear plants are considered “**critical infrastructure**” by the federal government, a designation that **means the industry takes extra precautions to monitor and protect cybersecurity**. To match, **the NRC has specific cybersecurity regulations dedicated to nuclear plant systems relied on for operation safety and security**. Nuclear plants, along with the entire electricity sector, have been improving cybersecurity since 2002.

Affirming reduces foreign involvement.

Stephen **Fitzgerald**, 6-28-20**19**, "Oil wars: Money and power are more important than climate action ," Independent Australia, https://independentaustralia.net/environment/environment-display/oil-wars-money-and-power-are-more-important-than-climate-action,12849 // MH

**THERE ARE TWO PATHWAYS that present themselves for humanity’s future**. **One is the marriage between governments and the power brokers controlling fossil fuel** and war **and the other is a move to sustainable energy**. The headlines are shocking beyond belief: there are four **warring factions in Yemen fighting over** 2.7 billion barrels of **oil** representing 90% of the country’s exports. 65% of the oil in Yemen is being stolen by Saudi Arabia and the French oil company Total, France being the worlds third largest arms dealer after the USA and Russia. For the war machine, arms manufacturers and arms dealers to prosper, you need something to fight over. In the Middle East, it’s oil and natural gas. They don’t care about the **85,000 children** who **have starved to death already** in Yemen. It’s all about money, power and control at any cost to humanity. Russia/Iran-backed Houthi claimed responsibility for the Saudi Arabia oil tanker drone strikes followed by torpedo attacks in the Gulf of Oman, saying they were a response to Saudi “aggression” and “genocide” in Yemen. Trump officials asserted Iran-Al Qaeda links and imposed more sanctions as the U.S. Senate votes to block arms sales to the Gulf. From the sideline, China warned not to open Pandora's Box in the Middle East. We are all involved in the same power play with Australia and the UK selling arms to Saudi Arabia. After the resulting public outcry, one may ask, who drives the oil wars and why? The “why” is easy — it’s about control of global energy supplies and profit to arms manufacturers and war economies. The “who” is a bit harder since we only see the political front men. No one is game to say it: our leaders are completely insane, but not so stupid as to realise that the “politics of fear” and false narrative keep them in power. Power for themselves and a green light for those they represent. **The East and West play the same murderous game for control of depleting oil** and natural gas reserves. To prevent all-out war, we need a balance of power and we need to be prepared for war, but that’s not the message here. The message is to telegraph the drivers of climate change denial. There are 1.5 billion barrels of oil and 200 billion cubic meters of natural gas being tapped by Israel. A large proportion of Israel’s fossil fuel wealth lies beneath land under Palestinian control. Then we have the **war in Syria to control** 2.5 billion barrels of **oil**, the **war in Afghanistan to control** 1 billion barrels of **oil** and 90 billion cubic meters of natural gas and the second **Libyan civil war for control of** territory and 46 billion barrels of **oil**. From geopolitical trends comes the **Middle East** Game of Thrones. This is a **play by** the **global superpowers** – **Russia, US**A **and China** – **for control of oil** and natural gas reserves and gives some insight into the “oil wars” raging right now. This is also a stark reality and explains the underlying reason for climate change denial in fossil fuel conglomerates, war economies and the governments who support them. Here is the clincher — the ongoing **conflict in Venezuela forcing 3 million citizens to flee** the country escalates the South American refugee crisis. With 297 billion barrels of oil, Venezuela **has the largest oil reserves** in the world **and the East–West fight, including a purported U.S. coup attempt, is one for control**. Just like Yemen, the same applies in Venezuela with **China and Russia**/Cuba **backing** the military dictatorship of Nicolás **Maduro for control of the country's** massive **oil** reserves. The U.S. and the West are backing Juan Guaidó for control, as the U.S. sanction-driven economic crisis escalates to destabilise the country and turn the population against Maduro. **In the world of fighting for control of oil** and natural gas, **it’s business as usual.** **If we transition** to renewable energy, that **takes away demand for fossil fuels** **and** **diffuse**s the **oil wars**. It also takes away the massive profits from both. Keeping that in mind and against all the scientific evidence, who are those most likely to be in climate change denial? Who are those opposing a responsible transition to renewables energy? Anyone associated with fossil fuels and/or the fight for control of fossil fuels will naturally be in climate change denial. There’s trillions of dollars to be made and these people don’t care about the outcome or who gets hurt. They don’t care about the death and destruction of societies, the murder of the innocent and the refugee crisis happening right now in real time. They most certainly don’t care about what may happen in the future; our future. It will never enter their heads. They don’t care about impending catastrophic climate change and they don’t care about the possible collapse of civilisation as predicted by Sir David Attenborough at the U.N. climate summit. Those in climate change denial only care about massive profits and have the attitude of “screw the planet, screw the rest of us and screw civilisation”. We are just collateral damage. Appealing to them will not stop them. We need a different approach. **We need to take away the demand for fossil fuels**. **The carbon clock is ticking** with average global temperatures set to rise by 2°C within 18 years. At 1°C today, we are already seeing the **melting of polar ice caps, sea level rise, catastrophic and extreme weather events and mass extinction.** **If we continue to fight over and burn all the fossil fuel** on the planet, **we won’t have a planet capable of supporting life** as we know it. The immediate response is: “How do we stand up to that? We are doomed.” **We are not doomed**. We have had the wool pulled over our eyes by the pro-fossil fuel and war economy factions. What has changed is that we are galloping towards catastrophic climate change if we continue to burn fossil fuels. Alarm bells are ringing and we are starting to wake up. **We have a choice:** **There is a 50-year supply of oil left on the planet. We can escalate the wars and burn all the oil, but what then?** Then **we are forced to transition to renewable energy but**, in terms of action on climate change, **it’s way too late**. The battle to stabilise the weather, save the natural world and prevent massive sea level rise is lost. **The other choice is a transition to renewable energy starting now**. **Our first step is to take action at home** and that would be installing a government that **embrace**s **a rapid phase-out of fossil fuel** and a rapid transition to renewable energy. We need to pressure governments that embrace the oil economy war machine and are not 100% committed to clean energy. It’s our children’s future, it’s our grandchildren's future, it’s the future of the planet and all life is on the line. It’s a fight worth fighting. Clean energy from the sun, wind and hydro or fossil fuels and war. It’s a pretty simple choice and one that needs to ripple through the community and across the entire planet. Scientists suggest **we are the last generation capable of standing up** for the rights of humanity and the protection of the natural world. We have a huge responsibility to fight for and protect that future.

It’s the root cause.

**Petti 21** [Matthew Petti, assistant editor at Reason Magazine. He worked for various Jordanian news outlets as a 2022-2023 Fulbright fellow. Previously, he worked as a reporter at Responsible Statecraft and a national security reporter at The National Interest. His work has appeared in the BBC, The Intercept, The Daily Beast, and New Lines magazine, 5-19-2021, New study: World likes American culture, opposes US military adventurism, Responsible Statecraft, https://responsiblestatecraft.org/nuclear-weapons/, accessed 3-24-2025.] //aayush

**Do people hate America for its freedoms? Or do they resent American interference?** A new study by the Eurasia Group Foundation suggests the latter. A **survey of 5,000 people across ten different countries found that the world is generally positive about American values and culture, but negative about U.S. military intervention**. Respondents were asked a variety of questions about America, including what changes they would like to see in American democracy. The study found that **resentment towards U.S. military interventions was a major driver of anti-American sentiment. So was disapproval of the U.S. war in Afghanistan**. “There’s so many assumptions baked into making foreign policy in the United States, so many assumptions about populations outside the U.S. and what these populations think and believe and value,” explained Mark Hannah, one of the authors of the study. “It is important to provide an **empirical basis to the work of foreign policymaking**.” Hannah said that he was surprised how “tidily” his results lined up with a pro-restraint worldview. Egyptian respondents in particular resented U.S. military intervention, with a majority claiming that U.S. military bases in the region threaten Egypt’s independence and only a minority agreeing that U.S. involvement has promoted regional stability. Egypt is the second-largest recipient of U.S. military aid worldwide, raking in $1.3 billion per year, and the Egyptian military has close ties to the U.S. military. “I think it’s important to distinguish between official opinion and public opinion in these countries,” Hannah said. “Whether or not you’re in a democracy, to some extent, public opinion is what gives political leaders a license to operate.” Perhaps most surprisingly, respondents in U.S. treaty allies like Germany and Japan were among the most negative about American democracy, U.S. influence, and America’s response to the coronavirus pandemic. “The findings were interesting, but I’m not 100 percent surprised by all of them,” said Rachel Rizzo, director of programs at the Truman Center and an adjunct fellow at the Center for a New American Security. “For some people in Germany, this idea that they’ve been constantly harangued by the United States for years obviously is going to result in some sort of negative sentiment.” She noted that the United States often pushes Europe to be more “forward-leaning” in its foreign policy, but then scolds it for making choices that U.S. policymakers disagree with.

1. No escalation: empirics

**De Cauwer 23** [Harald De Cauwer, Department of Neurology, Sint-Dimpna Regional Hospital, Geel, Belgium; Faculty of Medicine and Health Sciences, University of Antwerp, Wilrijk, Belgium, 1-17-2023, 50 Years of Terrorism against the Nuclear Industry: A Review of 91 Incidents in the Global Terrorism Database, PubMed Central (PMC), https://pmc.ncbi.nlm.nih.gov/articles/PMC10067068/, accessed 3-14-2025.] //aayush

**Ninety-one incidents that occurred from 1970 through 2020 were included**. Incidents took place **in 25 countries and nine world regions**, with most (42; 46.1%) occurring in Western Europe. During these 50 years, **91 incidents resulted in 19 fatalities** and 117 injuries. One perpetrator was killed during an incident and one other assailant was injured. **Bombings and explosions were the most frequently identified attack type** (n = 40; 44.0%), followed by facility/infrastructure damage (n = 24; 26.4%) and armed assaults and assassinations (both n = 7; 7.7%). **Nuclear power plants and reactors under construction were targeted in 13** (14.3%) **and eight** (8.8%) **incidents**, respectively. **Most of the attacks took place on other nuclear industry-related sites**. Conclusion: **Terrorist attacks carried out by non-state perpetrators against nuclear facilities, nuclear scientists, nuclear transport, and other nuclear industry-related targets are rare, with only 91 incidents in a 50-year period. None of the attacks resulted in radioactive fallout or environmental contamination**. Most of the attacks took place outside a nuclear power plant.

Terrorists don’t have the incentive.

**Shellenberger 18** [Michael Shellenberger, Best-selling author of San Fransicko (HarperCollins 2021) and Apocalypse Never (Harper Collins 2020), a Time Magazine “Hero of the Environment,” and Green Book Award Winner. He is Founder and President of Environmental Progress, an independent and nonprofit research organization based in Berkeley, California, 7-6-2018, If Nuclear Plants Are So Vulnerable To Terrorist Attack, Why Don't Terrorists Attack Them?, Forbes, https://www.forbes.com/sites/michaelshellenberger/2018/07/06/if-nuclear-plants-are-so-vulnerable-to-terrorist-attack-why-dont-terrorists-attack-them/#632add2b5877, accessed 3-24-2025.] //aayush

How many attacks were there on nuclear plants during that time? Zero. What about foiled plots? Also, zero. In fact, **there is zero evidence that any terrorist anywhere has planned an attack on a nuclear plant, much less tried to carry one out, since 9/11**. But didn’t the **9/11 hijackers** consider flying a jet plane into a nuclear plant? They did — and **quickly discarded the idea, choosing instead to crash jets into the World Trade Center’s Twin Towers, the Pentagon, and the White House**. Why? “**They thought a nuclear target would be difficult because the airspace around it was restricted**,” reported the 9/11 Commission, “**making reconnaissance flights impossible and increasing the likelihood that any plane would be shot down before impact**.” The 9/11 Commission added, “**Nor would a nuclear facility have particular symbolic value**.” **Terrorists, noted one expert 40 years ago, “are, in fact, television producers constructing a package so spectacular, so violent, so compelling that the networks, acting as executives, supplying the cameramen and the audience, cannot refuse the offer.” Where running people over, spraying them with gunfire, and blowing them up offers the package the media need, attacking a nuclear plant simply does not**. Since **nuclear plants are low-lying and often not visible from publicly accessible areas, there’s a good chance that a terrorist attack on a nuclear plant wouldn't be captured on film** — and **that would undermine a main goal of terrorist groups**, which is to create propaganda. What about fearful talk of terrorists wanting to attack a nuclear plant in Belgium? **There’s zero evidence that terrorists ever wanted to attack a nuclear plant in Belgium**. After raiding an apartment owned by a suspected terrorist, investigators found images taken of a nuclear researcher in Belgium. But he worked at a research laboratory that made medical isotopes, not a nuclear plant. The Belgium Government determined that the threat was "to the person in question, but not the nuclear facilities." Investigators suspected the terrorists wanted to kidnap the man and use him to gain access to a research facility in Mol. **Nobody doubts that terrorist groups would love to get their hands on a nuclear weapon**. Terrorist groups, including Al Qaeda, which carried out the 9/11 attacks, have tried in the past to obtain a nuclear weapon. And **preventing terrorists from getting access to nuclear materials is and should be one of the top priorities of anti-terrorist activity. But a nuclear plant might be the worst place imaginable to get the materials to make a bomb. Neither the fuel used by nuclear plants nor the nuclear waste are enriched enough to be used to make weapon**. And **any effort to break into a nuclear plant would risk undermining the terrorist network**. That’s why whenever terrorists try to make a nuclear bomb they instead look elsewhere for the materials. And **even if a jet plane were flown into a nuclear plant, or a bomb exploded inside, it’s unlikely any radioactive material would escape, given the heavy fortification of nuclear reactors by containment domes.** In 1988, the US government crashed an F4 Phantom jet traveling at 500 MPH into a slab of concrete the thickness of the walls of a nuclear plant. It dissolved upon impact, leaving the wall undamaged. But even if some radioactive material did escape, as occurred at Fukushima, vastly more harm would come from panic and over-evacuation, as scientists recently emphasized, than from small amounts of radioactive material scattered from the accident.

**Lawrence 24** [Lawrence, Company that offers solutions in several areas, including virtual data rooms (VDRs) for secure sharing of content and business process automation, dairy bioactive solutions derived from bovine colostrum, and IT professional services, 8-20-2024, Closing the cybersecurity gap: the hidden threat to renewables, Energy Monitor, https://www.energymonitor.ai/sponsored/closing-the-cybersecurity-gap-the-hidden-threat-to-renewables/, accessed 3-23-2025.] //aayush

**As the renewable energy sector rapidly digitalises, it faces an increased threat of cyberattacks. Averaging 736 cyberattacks per week** in 2021[i], the **renewable energy sector remains susceptible to hostile attackers online**, with high-profile victims in recent years including Vestas and Enercon. The **energy sector is a primary target of cyberattacks, with 16% of all cyberattacks aimed at the sector in 2020**[ii]. These cyberattacks can have significant **consequences**, such as **taking down power grids for days or weeks, causing power shortages, and ultimately increasing energy prices**. Recent cyberattacks in the sector have **disabled remote controls for wind farms, disrupted prepaid meters and led to recurrent data breaches**. Research curated by analytics firm GlobalData shows that, **in 2022**, the **average cost of data breaches alone reached $4.72 million in the energy sector**[iii]. These attacks are often **geopolitically motivated**, as countries seek to exploit vulnerabilities and exert influence. To address these challenges, power companies and stakeholders must invest in cybersecurity solutions and adopt a strategic approach to ensure the security and resilience of their operations. This includes implementing AI-based monitoring and detection platforms to protect Internet of Things (“IoT”) devices from cyberattacks. Additionally, there is a need for collaboration between the clean energy and cybersecurity communities. How we got here: home working and the cyberskills shortage One issue directly related to cybersecurity links back to the worldwide Covid-19 pandemic and the rush to home working. A Kaspersky survey in April 2020, found that nearly half of the 6,000 respondents had never worked from home before. In the rush to home working practices during the pandemic, the survey found that in over 70% of cases, employers did not include cybersecurity training, which may go some way in explaining the surge in attacks around this time period. However, in the last few years, one of the **biggest issues** faced by the renewable energy sector is a **worldwide shortage of energy cybersecurity skills**. The skills gap has been a long-standing issue, and the demand for cybersecurity professionals has consistently been high. Research from GlobalData’s Job Analytics shows a **32% drop in new job postings related to cybersecurity in Q4 2023 compared with the previous quarter**. GlobalData’s Power: Hiring Trends & Signals Q4 2023 report also reveals that 43% of all cybersecurity-related new jobs in the power industry (tracked by GlobalData) as of Q4 2023, were for just five companies: Prysmian, Siemens, Schneider Electric, Elektroprivreda Crne Gore AD Niksic and A2A. According to research collated by GlobalData, the **size of the workforce is still 65% below what is needed**[iv]. The global cyberworkforce gap reached four million people in 2023, despite an increase in the global cybersecurity workforce to 5.5 million. This demand is expected to keep increasing as organisations become both more dependent on technology and face more complex threats. The good news is that the cybersecurity skills gap appears to be levelling off. This is partly due to initiatives such as colleges and universities in the US investing heavily in cybersecurity education over the past five years. As a result, there should be a growing pipeline of computer science graduates entering the cybersecurity field between now and 2031. In addition, women are expected to represent 30% of the global cybersecurity workforce by 2025, with that figure reaching 35% by 2031. Why are renewable energy companies under threat from hackers? Cyberattacks on all organisations continue to rise, but critical national infrastructure (**CNI**) – the **systems that are required for a country to run** – **are especially seen by bad actors as targets**. **Cybersecurity is crucial for power companies, as they are directly linked to the functioning of a country’s economy**. For instance, utilities have been warned to be extra vigilant due to the geopolitical situation between Europe and Russia over energy[v]. **Hackers target renewable companies with malware and ransomware attacks, data wiping and theft, and** Distributed Denial of Service (**DDoS**) **attacks**. These cyberattacks can **disrupt operations, disable remote controls for wind farms and lead to data breaches** involving sensitive client information. Customers’ private financial data also risks being accessed by cybercriminals. Renewable companies are **particularly under threat from hackers due to digitalisation of the sector, which potentially can make them more vulnerable to cyberattacks**. Digital transformation of energy infrastructure is essential to enable the efficient integration of renewable energy sources as they come online. The US Federal government has already recognised these challenges as a priority and pledged $45 million to enhance the cybersecurity of clean energy technologies and the energy supply chain[vi]. Without energy, other industries cannot operate. A cyberattack wiping out power can have catastrophic effects on people, businesses and whole communities.

Nuclear energy is better.

**Cummings 24** [Graham Cummings, 7-9-2024, "**Nuclear electricity supply would be less vulnerable to attack than renewables**", Strategist, https://www.aspistrategist.org.au/nuclear-electricity-supply-would-be-less-vulnerable-to-attack-than-renewables/] //bid daddy yerg

**Renewable energy generation is not as robust in the face of enemy attack as it looks**. Nuclear power, even though it would probably be concentrated in a few large generating stations, should in fact be a little more dependable in wartime. This warrants careful consideration, because an enemy may choose incapacitation of electricity supply to pressure Australia into cease fighting, just as Russia has repeatedly attacked Ukraine’s power generation and distribution system. Yes, solar and wind electricity generation is dispersed into many units of modest output, each relatively uneconomical to attack, as Chris Douglas points out in an article in The Strategist. **But supply-firming installations, such as batteries and peak-demand generators, are not as numerous and can be targeted instead**. Moreover, renewable generation is just as reliant on a limited number of key transmission lines and substations in the distribution grid as big power stations are. Also, whether an enemy would take the huge step of attacking nuclear power stations is doubtful. How easily an enemy could cripple electricity supply can be analysed in terms of the criticality of points in the system, their vulnerability and their recuperability. Consider a hypothetical but plausible case in which seven nuclear power stations have a combined capacity of 11 gigawatts. Each is critical, because losing its output would cause great economic disruption. But the same applies to supply-firming installations that back up renewables. Australia’s eight largest planned firming installations have a capacity of about 11 gigawatts, so the concentration of supply in critical assets is quite comparable in the nuclear-generation and renewables-generation scenarios. As for vulnerability, concentration of generation capacity in nuclear stations would simplify protection with air and missile defences. In the all-renewables scenario, defences would instead cover the largest firming assets, but we would have to accept risk with the remainder. If an enemy overcomes air and missile defences and scores hits, nuclear power stations may actually be less vulnerable than the equivalent firming assets, because they are necessarily built with impressive, passive defensive and protection measures. To achieve a high probability of kill our adversary would likely need to increase the volume or yield of the missile attack. Now, penetration of the containment building is likely to knock out the station out regardless of damage to the reactor, because cooling systems, heat exchangers or condensers will likely be damaged. But a catastrophic release of radiation is less likely. And in fact the more vulnerable part of the station is the adjacent turbine hall. But it would be no more vulnerable than firming installations—gas or hydro power stations or large lithium batteries. Then there’s the question of recuperability—how quickly installations can be brought back on line after damage. In the nuclear-generation scenario, reactor damage would be catastrophic and take months to years to recuperate. But, as noted above, it would be improbable, and the more likely problem would be damage to ancillary systems, turbines or the station’s transformers. They could be fixed or replaced in about as much time as the turbines or transformers of firming installations could be, and possibly faster than an array of large lithium batteries. Note that replacing ancillary systems, turbines and transformers would not be far from current Australian manufacturing capabilities. So, in both nuclear-generation and renewable-generation scenarios there is risk in concentrated sources of electricity, but on balance the nuclear set-up is not appreciably worse and may even be better. Regardless of the means of generation, the main vulnerability is in the distribution network. While renewable generation assets are numerous, they are also functionally useless in isolation: the system works only if networked together so that when the sun isn’t shining in Queensland, for example, the South Australian wind can take up the slack. There are about 305 substations across the National Electricity Market, and destruction or disablement of only the four main interconnector transmission lines is likely sufficient to splinter the system. Destruction of only eight substations is likely to isolate the main generating regions from the capital cities, regardless of how much renewable capacity there is. Substations, being compact and not particularly robust, are also much more vulnerable to attack. **Vulnerability will rise in the renewable-generation scenario. Because renewables capacity is often built far from demand, the distribution grid grows, increasing the area to be protected, and relying more on internet enabled control systems. This increases vulnerability to additional attack vectors, including cyber and sabotage. The protection against this may be far more draining on limited national capabilities.**

**Hickel 19**, PhD, Fellow of the Royal Society of Arts, Senior Lecturer at Goldsmiths, University of London. (Jason, 5-6-2019, "The Limits of Clean Energy", Foreign Policy, https://foreignpolicy.com/2019/09/06/the-path-to-clean-energy-will-be-very-dirty-climate-change-renewables/)

We need a rapid transition to renewables, yes—but scientists warn that **we** **can’t** **keep growing energy use at existing rates**. No energy is innocent. **The only truly** **clean** **energy is** **less energy.** In 2017, the World Bank released a little-noticed report that offered the first comprehensive look at this question. It models the increase in material extraction that would be required to build enough solar and wind utilities to produce an annual output of about 7 terawatts of electricity by 2050. That’s enough to power roughly half of the global economy. By doubling the World Bank figures, we can estimate what it will take to get all the way to zero emissions—and the results are staggering: 34 million metric tons of copper, 40 million tons of lead, 50 million tons of zinc, 162 million tons of aluminum, and no less than 4.8 billion tons of iron. In some cases, **the transition to** **renewables will require a** **massive increase** **over** **existing levels** **of extraction**. For **neodymium**—an essential element in wind turbines—**extraction will need to** rise by nearly 35 percent over current levels. Higher-end estimates reported by the World Bank suggest it could **double**. The same is true of silver, which is critical to solar panels. Silver extraction will go up 38 percent and perhaps as much as 105 percent. Demand for **indium**, also essential to solar technology, **will** **more than** **triple** **and could** **end up skyrocketing by** **920 percent**. And then there are all the batteries we’re going to need for power storage. **To keep energy flowing when the sun isn’t shining and the wind isn’t blowing will require** **enormous batteries** at the grid level. **This means** **40 million tons of** **lithium**—**a**n eye-watering **2,700 percent** **increase** **over** **current levels** **of extraction. That’s just for electricity. We also need to think about** **vehicles**. This year, a group of leading British scientists submitted a letter to the U.K. Committee on Climate Change outlining their concerns about the ecological impact of electric cars. They agree, of course, that we need to end the sale and use of combustion engines. But they pointed out that unless consumption habits change, **replacing** **the world’s projected fleet of** **2 billion vehicles** **is going to** **require an** **explosive increase in mining**: Global annual extraction of neodymium and dysprosium will go up by another 70 percent, annual extraction of copper will need to more than double, and cobalt will need to increase by a factor of almost four—all for the entire period from now to 2050. The problem here is not that we’re going to run out of key minerals—although that may indeed become a concern. The real issue is that **this will** **exacerbate** **an** **already existing crisis of overextraction**. **Mining** has become one of the biggest single **drive**r**s of** **deforestation,** **ecosystem collapse, and** **biodiversity loss** around the world. Ecologists estimate that **even at** **present** **rates of global material use, we are** **overshooting sustainable levels** **by** **82 percent.** Take silver, for instance. Mexico is home to the Peñasquito mine, one of the biggest silver mines in the world. Covering nearly 40 square miles, the operation is staggering in its scale: a sprawling open-pit complex ripped into the mountains, flanked by two waste dumps each a mile long, and a tailings dam full of toxic sludge held back by a wall that’s 7 miles around and as high as a 50-story skyscraper. This mine will produce 11,000 tons of silver in 10 years before its reserves, the biggest in the world, are gone. **To transition the global economy to renewables, we need to commission up to** **130 more mines** **on the scale of** **Peñasquito**. **Just for silver**. **Lithium is another** **ecological disaster**. **It takes** **500,000 gallons of water** **to produce a** **single ton of lithium**. Even at present levels of extraction **this is causing** problems. In the Andes, where most of the world’s lithium is located, **mining companies** **are** **burning** **through** **the** **water** **tables** **and leaving farmers with** **nothing** **to irrigate their crops**. Many have had no choice but to abandon their land altogether. Meanwhile, **chemical leaks** **from lithium mines** **have** **poisoned rivers** from Chile to Argentina, Nevada to Tibet, **killing off** **whole** **freshwater** **ecosystems**. **The lithium boom has** **barely even started, and it’s** **already a crisis**. And **all of this is just to power the** **existing** **global economy**. **Things become** **even more** **extreme** **when we** start **account**ing **for** **growth. As energy demand continues to rise, material extraction for renewables will become** **all the more aggressive**—and **the** **higher the growth rate, the** **worse** **it will get.** It’s important to keep in mind that most of the key materials for the energy transition are located in the global south. Parts of **Latin America, Africa, and Asia will** **likely** **become the target of** **a** **new scramble for resources**, **and** **some countries may** **become** **victims of** **new forms of colonization**. **It happened in the 17th and 18th centuries with the hunt for** **gold** **and** **silver** from South America. In the 19th century, it was land for cotton and sugar plantations in the Caribbean. In the 20th century, it was diamonds from South Africa, cobalt from Congo, and oil from the Middle East. **It’s** **not difficult** **to imagine that the scramble for renewables might become** **similarly violent.** If we don’t take precautions, **clean energy** **firms** **could become** **as destructive as fossil fuel** **companies**—**buying off** **politicians,** **trashing** **ecosystems,** **lobbying against** **environmental** **regulations**, **even** **assassinating community leaders** who stand in their way.

Barry W. **Brook et al.**, Agustin Alonso, Daniel A. Meneley, Jozef Misak, Tom Blees, Jan B. van Erp, 12/20**14**, "Why nuclear energy is sustainable and has to be part of the energy mix," Faculty of Science, Engineering & Technology, University of Tasmania, Australia, Sustainable Materials and Technologies vol 1-2, https://www.sciencedirect.com/science/article/pii/S2214993714000050 // MH

**Humanity must face the reality that it cannot depend indefinitely on combustion of coal, gas and oil** for most of its energy needs. In the unavoidable process of gradually replacing fossil fuels, many energy technologies may be considered and most will be deployed in specific applications. However, **in the long term, we argue that nuclear fission** technology **is the only** developed **energy source that is capable** of delivering the enormous quantities of energy that will be needed to run modern industrial societies safely, economically, reliably and in a sustainable way, **both environmentally and as regards the available resource base**. Consequently, nuclear fission has to play a major role in this necessary transformation of the 21st century energy-supply system. In a first phase of this necessary global energy transformation, the emphasis should be on converting the major part of the world's electrical energy generation capacity from fossil fuels to nuclear fission. This can realistically be achieved within a few decades, as has already been done in France during the 1970s and 1980s. Such an energy transformation would reduce the global emissions of carbon dioxide profoundly, as well as cutting other significant greenhouse gases like methane. Industrial nations should take the lead in this transition. Because methane is a potent greenhouse gas, replacing coal-fired generating stations with gas-fired stations will not necessarily result in a reduction of the rate of greenhouse-gas emission even for relatively low leakage rates of the natural gas into the atmosphere. The energy sources popularly known as **‘renewables’** (such as wind and solar), will be hard pressed to supply the needed quantities of energy sustainably, economically and reliably. They are **inherently** intermittent, **depend**ing **on backup power or** on energy **storage** if they are to be used for delivery of base-load electrical energy to the grid. This **backup power** has to be flexible and **is derived** in most cases **from** combustion of **fossil fuels** (mainly natural gas). If used in this way, intermittent energy sources do not meet the requirements of sustainability, nor are they economically viable because they require redundant, under-utilized investment in capacity both for generation and for transmission. **Intermittent energy** installations, in conjunction with gas-fired backup power installations, **will in many cases** be found to **have a combined rate of greenhouse-gas emission** that is **higher** **than** that of **stand-alone coal**-fired generating stations **of equal** generating **capacity**. A grid connection fee, to be imposed on countries with a large intermittent generating capacity, should be considered for the purpose of compensating adjacent countries for the use of their interconnected electric grids as back-up power. **Also**, intermittent energy sources tend to **negatively affect grid stability**, especially as their market penetration rises. The alternative — dedicated energy **storage** for grid-connected intermittent energy sources (instead of backup power) — **is** in many cases **not** yet **economically viable**. However, intermittent sources plus **storage may be** economically **competitive for local** electricity **supply in** geographically **isolated regions without access to a** large electric **grid**. **Yet nuclear** fission energy **will, even then, be required for the majority displacement of fossil fuels this century**.