United Nations, xx-xx-xxxx, "The Climate Crisis – A Race We Can Win", https://www.un.org/en/un75/climate-crisis-race-we-can-win

Billions of tons of CO2 are released into the atmosphere every year as a result of coal, oil, and gas production. Human activity is producing greenhouse gas emissions at **a record high**, with no signs of slowing down. According to a ten-year summary of UNEP Emission Gap reports, we are on track to maintain a "business as usual" trajectory.

The last four years were the four hottest on record. According to a September 2019 World Meteorological Organization (WMO) report, we are at least **one degree** Celsius above preindustrial levels and close to what scientists warn would be "an unacceptable risk". The 2015 Paris Agreement on climate change calls for holding eventual warming "well below" two degrees Celsius, and for the pursuit of efforts to limit the increase even further, to 1.5 degrees. But if we don't slow global emissions, temperatures could rise to **above three degrees Celsius by 2100**, causing further irreversible damage to our ecosystems.

Glaciers and ice sheets in polar and mountain regions are already melting faster than ever, causing sea levels to rise. Almost **two-thirds of the world's cities** with populations of over five million are located in areas at risk of sea level rise and almost 40 per cent of the world's population live within 100 km of a coast. If no action is taken, entire districts of New York, Shanghai, Abu Dhabi, Osaka, Rio de Janeiro, and many other cities could find themselves underwater **within our lifetimes**, displacing millions of people.

Global warming impacts everyone's food and water security. Climate change is a direct cause of soil degradation, which limits the amount of carbon the earth is able to contain. Some 500 million people today live in areas affected by erosion, while up to **30 per cent** of food is lost or wasted as a result. Meanwhile, climate change limits the availability and quality of water for drinking and agriculture.

In many regions, crops that have thrived for centuries are struggling to survive, making food security more precarious. Such impacts tend to fall primarily on the poor and vulnerable. Global warming is likely to make economic output between the world's richest and poorest countries **grow wider** Disasters linked to climate and weather extremes have always been part of our Earth's system. But they are becoming more frequent and intense as the world warms. No continent is left untouched, with heatwaves, droughts, typhoons, and hurricanes causing mass destruction around the world. **90 per cent** of disasters are now classed as weather- and climate-related, costing the world economy **$20 billion USD each year**, while 26 million people are pushed into poverty as a result.

Climate change is a major threat to international peace and security. The effects of climate change heighten competition for resources such as land, food, and water, fueling socioeconomic tensions and, increasingly often, leading to **mass displacement**.

Climate is a **risk multiplier** that makes worse already existing challenges. Droughts in Africa and Latin America directly feed into political unrest and violence. The World Bank estimates that, in the absence of action, more than **140 million people** in Sub-Saharan Africa, Latin America, and South Asia will be forced to migrate within their regions by 2050.

While science tells us that climate change is irrefutable, it also tells us that it is not too late to stem the tide. This will require fundamental transformations in all aspects of society — how we grow food, use land, transport goods, and power our economies.

While technology has contributed to climate change, new and efficient technologies can help us reduce net emissions and create a cleaner world. Readily-available technological solutions already exist for more than **70 per cent** of today's emissions. In many places renewable energy is now the cheapest energy source and electric cars are poised to become mainstream.

In the meantime, nature-based solutions provide 'breathing room' while we tackle the decarbonization of our economy. These solutions allow us to mitigate a portion of our carbon footprint while also supporting vital ecosystem services, biodiversity, access to fresh water, improved livelihoods, healthy diets, and food security. Nature-based solutions include improved agricultural practices, land restoration, conservation, and the greening of food supply chains.

Scalable new technologies and nature-based solutions will enable us all to leapfrog to a cleaner, more resilient world. If governments, businesses, civil society, youth, and academia work together, we can create a green future where suffering is diminished, justice is upheld, and harmony is restored between people and planet.

Hannam, Peter. "The Coalition says its nuclear plants will run for 100 years. What does the international experience tell us?" The Guardian, June 24, 2024, https://www.theguardian.com/australia-news/article/2024/jun/24/coalition-nuclear-policy-peter-dutton-power-plants-100-years-run-time. Accessed March 9, 2025.

That claim comes despite the CSIRO's Gencost report estimating each 1-gigawatt nuclear plant could take 15-20 years to build and cost $8.4bn. The first may be double that given the high start-up costs. But what does the state of the nuclear energy internationally tell us about the Coalition's proposal?

Borenstein, Seth and Jamey Keaten. "UN climate chief presses for faster action, says humans have 2 years left 'to save the world'." AP News, April 10, 2024,

https://apnews.com/article/climate-change-finance-un-elections-stiell-0b176237b1e4a78d28d5dbcbbf7809f0. Accessed March 8, 2025.

Humanity has only two years left "to save the world" by making dramatic changes in the way it spews heat-trapping emissions and it has even less time to act to get the finances behind such a massive shift, the head of the United Nations climate agency said. With governments of the world facing a 2025 deadline for new and stronger plans to curb carbon, nearly half of the world's populations voting in elections this year, and crucial global finance meetings later this month in Washington, United Nations executive climate secretary Simon Stiell said Wednesday he knows his warning may sound melodramatic. **But he said action over the next two years is "essential."**

Khan, Anwar et. al. "Efficacy of CO2 emission reduction strategies by countries pursuing energy efficiency, nuclear power, and renewable electricity." Energy, August 1, 2024, https://doi.org/10.1016/j.energy.2024.131418. Accessed March 9, 2025.

Third, the negative coefficients of energy efficiency across the tested models indicate that the countries' energy efficiency is effective in CO2 emissions reduction. **Finally, the results discovered that nuclear and renewable electricity pathways tend to crowd out each other, where this phenomenon is not valid in the cases of nuclear power-energy efficiency and renewable electricity-energy efficiency, where they support each other.**

The renewable energy market is strong despite Trump.

Copley 25 [Michael (correspondent on NPR's Climate Desk; covers what corporations are and are not doing in response to climate change, and how they're being impacted by rising temperatures.), "America's clean-energy industry is growing despite Trump's attacks. At least for now," March 12, 2025, NPR, https://www.npr.org/2025/03/12/nx-s1-5319056/trump-clean-energy-electricity-climate-change] DOA 03-17-2025//abhi***Brackets in OG***

Despite the **Trump administration's wide-ranging attacks** on **renewables** like wind and solar power, the **clean-energy industry** is on pace for **record growth** this year, according to government analysts. The buildout of big solar and battery plants is expected to hit an all-time high in 2025, accounting for 81% of new power generation that companies will add to America's electric grids, the Energy Information Administration (EIA) said in a recent report. Including **wind** projects, the share of new **power capacity** that's expected to come **online this year** from **renewables and batteries jumps** to **93%**, the EIA said. The U.S. needs all the power it can get, because electricity **demand** is **surging** for the first time in decades, industry analysts and executives say. That means kickstarting development of nuclear power and geothermal projects, burning more natural gas and, in some cases, delaying retirement of old coal plants. But in the scramble for electricity, **renewable-energy** and battery plants are **crucial**, **analysts** and **executives** say, because **they're quick to build** and **provide electricity that's** relatively **cheap**. "There is no doubt that the increased demand for electricity over the next decade, coming from data centers and advanced manufacturing, will continue to require vast amounts of renewable energy and batteries," Andrés Gluski, chief executive of The AES Corporation, a power company that owns both clean-energy and fossil-fuel plants, told Wall Street analysts recently. Still, the renewables industry faces potential upheaval. The Trump administration tried to withhold federal funding Congress previously approved for climate and clean-energy projects. Trump also ordered the government to temporarily stop issuing or renewing leases for offshore wind projects in federal waters. The Department of the Interior limited who at the agency can issue permits for renewable energy projects on public lands, which could slow permitting. And conservatives are pushing Congress to wipe out tax incentives for clean energy. If the disruptions spread, companies could abandon plans to build new power plants. That could dampen economic growth and hamstring efforts to develop data centers for artificial intelligence, a priority of the

Trump administration. In an interview that aired Sunday on Fox News, Trump declined to rule out the possibility of an economic recession this year. "At a time when we're all very concerned about energy abundance and this administration's broad goal of re-establishing energy dominance, just the idea that we'd be constraining the build of new energy [infrastructure] really feels like it's rowing in the wrong direction," says Rich Powell, chief executive of the Clean Energy Buyers Association, whose members range from Amazon to ExxonMobil to Walmart. Interior Secretary Doug Burgum chairs the Trump administration's National Energy Dominance Council. An Interior Department spokesperson, Elizabeth Peace, said in a statement that the agency supports renewable-energy development "where it makes sense while ensuring that all energy sources contribute to a reliable and affordable power grid." **Demand** for clean energy 'is certainly **not going away**' The clean-energy industry has exploded over the past decade. Solar, in particular, has accelerated. Meanwhile, growth in the wind industry has slowed because of problems ranging from inflation to pushback on siting projects. The industry overall has boomed thanks to falling technology costs, federal tax incentives and state renewable-energy mandates. The market got another big boost in 2022, when President Joe Biden signed the Inflation Reduction Act, which provided hundreds of billions of dollars in federal funding for clean-energy projects, among other climate investments. **Corporations** like **Amazon**, **Meta** and **Google** have also played a role, **signing contracts** to buy ever-larger amounts of **renewable energy**. "I expect that that will continue," says Powell of the Clean Energy Buyers Association. "The demand is certainly not going away." Some big investors seem to take a similar view. Led by Trump supporter Steve Schwarzman, the investment firm Blackstone said in February that it raised $5.6 billion for its "energy transition" business, which in the past has invested in companies that work in the renewable energy industry. Also last month, Brookfield Asset Management agreed to buy a U.S. renewable energy business for more than $1.7 billion. "Renewables will be the biggest beneficiary of growing electricity demand because they are **the cheapest option**, and [electricity buyers] will always absorb as much of the cheapest source of power before turning to more expensive forms of power," Brookfield's chief executive, Bruce Flatt, told Wall Street analysts in February. Congressional Republicans have backed Trump's pro-fossil fuel agenda. But a group of 21 GOP lawmakers recently called for Congress to preserve tax credits that support the renewable energy industry. "As energy demand continues to skyrocket, any modifications that inhibit our ability to deploy new energy production risk sparking an energy crisis in our country, resulting in drastically higher power bills for American families," the lawmakers wrote to the Republican chairman of the House Ways and Means Committee, Rep. Jason Smith of Missouri. Key conservatives call for backing natural gas instead Clean energy's draw could wear off as Trump's policies take effect, says Diana Furchtgott-Roth, director of the Center for Energy, Climate, and Environment at the Heritage Foundation, a conservative think tank. The Heritage Foundation produced a governing agenda called Project 2025 that aligns with many actions Trump has taken so far. Among its dozens of recommendations, the plan calls for Congress to repeal the Inflation Reduction Act, which could eliminate tax incentives that lower the price tag for clean-energy projects. "I think that what you're seeing [right now] is people operating with the old prices" in U.S. power markets, Furchtgott-Roth says. "But I think that that might change." Rather than renewables and batteries, Furchtgott-Roth says natural gas is "the wave of the future for the United States." After all, she says, the country has "an almost infinite supply." The U.S. has huge reserves of natural gas, but its main component, methane, is a big contributor to global warming. Natural gas fueled about 43% of America's electricity last year, according to a report from BloombergNEF and the Business Council for Sustainable Energy. The country will almost certainly burn more gas to meet growing power demand, industry analysts say. Gas plants can produce electricity when it's needed, which regulators say is becoming more important because large parts of the country are expected to face a growing risk of blackouts as coal plants retire. "We are unabashedly pursuing a policy of more American energy production and infrastructure, not less," Energy Secretary Chris Wright said Monday at an energy conference in Houston, where he touted the importance of natural gas, according to a copy of his prepared remarks. Wright downplayed the role of renewables and called climate change a "side effect of building the modern world." Executives say it will take years to build a lot of new gas plants A problem with gas plants, though, is that the cost to build them has risen, industry executives say. Gas turbines are also on backorder, and that means companies can't build plants fast enough to meet rising electricity demand in the next few years. "Renewables and storage are ready now to meet that demand and will help lower power prices. Gas-fired generation is moving forward but won't be available at scale until 2030," John Ketchum, chief executive of NextEra Energy, told Wall Street analysts days after Trump's inauguration. NextEra runs one of the world's top renewable energy developers and also has a big natural gas business. The EIA says solar will account for just over half of new power generation that will get built in the U.S. this year. So far, the Trump administration hasn't targeted solar like it has the wind industry, and developers are moving ahead with projects, says Paula Mints, chief analyst at SPV Market Research, which tracks the solar market. But she says companies are nervous. Sweeping tariffs from the Trump administration could increase costs across the U.S. energy industry, making it more expensive to build new power plants of all kinds, says John Hensley, senior vice president of markets and policy analysis at American Clean Power, a trade group. And if Congress gets rid of clean-energy tax credits in the Inflation Reduction Act, power prices for homeowners, renters and businesses would go up, and the country would build fewer clean energy projects, according to a study commissioned by the Clean Energy Buyers Association. The result is confusion in the market, leading some businesses to rethink U.S. investments. Days after Trump's inauguration, an Italian company called the Prysmian Group cancelled plans to build a factory in Massachusetts that would have supplied undersea cables for offshore wind projects. An Indian solar manufacturer, Premier Energies, recently told investors that it paused plans for a U.S. plant until it knows what will happen to federal tax incentives. And Aspen Aerogels, an American firm, stopped construction of a factory in Georgia where it planned to make components for electric vehicles, citing an "evolving environment." In a recent report, Climate Power, an advocacy group, says more than 42,000 announced clean-energy jobs have been "threatened or eliminated" since Trump took office. In the face of rising power demand, the last thing the country needs is to slow down clean-energy development, Ketchum told analysts in January. "We can't afford to take any options off the table," he said.

Investing in nuclear energy would crowd out better, renewable solutions.

Lovins 21 [Amory B. (Professor and Lecturer of Civil and Environmental Engineering @ Stanford University), "Why Nuclear Power Is Bad for Your Wallet and the Climate," Bloomberg Law, Dec. 17, 2021, https://news.bloomberglaw.com/environment-and-energy/why-nuclear-power-is-bad-for-your-wallet-and-the-climate] DOA 03-17-2025//

As Congress and the Department of Energy pile new subsidies on nuclear power and the Nuclear Regulatory Commission seeks to gut its regulation, its marginal output additions have shrunk below 0.5% of the world market, says physicist Amory B. Lovins, adjunct professor of civil and environmental engineering at Stanford University. He explains why nuclear energy is not the answer to climate change, but actually worsens it due to climate opportunity cost. Does climate protection need more nuclear power? No—just the opposite. Saving the most carbon per dollar and per year requires not just generators that burn no fossil fuel, but also those deployable with the least cost and time. Those aren't nuclear. Making 10% of world and 20% of U.S. commercial electricity, nuclear power is historically significant but now stagnant. In 2020, its global capacity additions minus retirements totaled only 0.4 GW (billion watts). Renewables in contrast added 278.3 GW—782x more capacity—able to produce about 232x more annual electricity (based on U.S. 2020 performance by technology). **Renewables** swelled supply and displaced **carbon** as much **every 38 hours** as **nuclear** did **all year**. As of early December, 2021's score looks like nuclear –3 GW, renewables +290 GW. Game over. The world already invests annually $0.3 trillion each, mostly voluntary private capital, in energy efficiency and renewables, but about $0.015–0.03 trillion, or 20–40x less, in nuclear—mostly conscripted, because investors got burned. Of 259 US power reactors ordered (1955–2016), only 112

got built and 93 remain operable; by mid-2017, just 28 stayed competitive and suffered no year-plus outage. In the oil business, that's called an 89% dry-hole risk. Renewables provided all global electricity growth in 2020. Nuclear power struggles to sustain its miniscule marginal share as its vendors, culture, and prospects shrivel. World reactors average 31 years old, in the U.S., 41. Within a few years, old and uneconomic reactors' retirements will consistently eclipse additions, tipping output into permanent decline. World nuclear capacity already fell in five of the past 12 years for a 2% net drop. Performance has become erratic: the average French reactor in 2020 produced nothing one-third of the time. China accounts for most current and projected nuclear growth. Yet China's 2020 renewable investments about matched its cumulative 2008–20 nuclear investments. Together, in 2020 in China, sun and wind generated twice nuclear's output, adding 60x more capacity and 6x more output at 2–3 times lower forward cost per kWh. Sun and wind are now the cheapest bulk power source for over 91% of world electricity. Nuclear Power Has No Business Case Nuclear power has bleak prospects because it has no business case. New plants cost 3–8x or 5–13x more per kWh than unsubsidized new solar or windpower, so new nuclear power produces 3–13x fewer kWh per dollar and therefore displaces 3–13x less carbon per dollar than new renewables. Thus buying nuclear makes climate change worse. End-use efficiency is even cheaper than renewables, hence even more climate-effective. Arithmetic is not an opinion. Unsubsidized efficiency or renewables even beat most existing reactors' operating cost, so a dozen have closed over the past decade. Congress is trying to rescue the others with a $6 billion lifeline and durable, generous new operating subsidies to replace or augment state largesse—adding to existing federal subsidies that rival or exceed nuclear construction costs. But no business case means no climate case. Propping up obsolete assets so they don't exit the market blocks more climate-effective replacements—efficiency and renewables that save even more carbon per dollar. Supporters of new subsidies for the sake of the climate just got played. Fashionably rebranded "Small Modular" or "Advanced" reactors can't change the outcome. Their smaller units cost less but output falls even more, so SMRs save money only in the sense in which a smaller helping of foie gras helps you lose weight. They'll initially at least double existing reactors' cost per kWh; that cost is ~3–13x renewables' (let alone efficiency's); and renewables' costs will halve again before SMRs can scale. Do the math: 2 x (3 to 13) x 2 = 12–52-fold. Mass production can't bridge that huge cost gap—nor could SMRs scale before renewables have decarbonized the US grid. Even free reactors couldn't compete: their non-nuclear parts cost too much. Small Modular Renewables are decades ahead in exploiting mass-production economies; nuclear can never catch up. It's not just too little, too late: **nuclear hogs market space, jams grid capacity**, and **diverts investments** that more-climate-effective **carbon-free competitors** then **can't contest**. Meanwhile, SMRs' novel safety and proliferation issues threaten threadbare schedules and budgets, so promoters are attacking bedrock safety regulations. NRC's proposed Part 53 would perfect long-evolving regulatory capture—shifting its expert staff's end-to-end process from specific prescriptive standards, rigorous quality control, and verified technical performance to unsupported claims, proprietary data, and political appointees' subjective risk estimates. But that final abdication can't rescue nuclear power, which stumbles even in countries with impotent regulators and suppressed public participation. In the end, physics and human fallibility win. History teaches that lax regulation ultimately causes confidence-shattering mishaps, so gutting safety rules is simply a deferred-assisted-suicide pact. Modern renewable generation keeps rising faster than nuclear output ever did in its 1980s heyday. During 2010–20, renewables reduced global power-sector carbon emissions 6x more than coal-to-gas switching (ignoring methane escape), and 5x more than nuclear growth. Among compelling examples, Germany replaced both nuclear and coal generation with efficiency and renewables: in 2010–20, generation from lignite fell 37%, hard coal 64%, oil 52%, and nuclear 54%; gas power rose 3%; GDP rose 11% (17% pre-pandemic); power-sector CO2 fell 41%, meeting its target a year early with five percentage points to spare. Japan's savings and renewables meanwhile displaced 109% of lost nuclear output if adjusted for GDP growth, 95% if not, so its 21 "operational" reactors, shut for 10–14 years and counting, lost their market. And no country retains an operational need or business case for big "baseload" thermal plants—costly, inflexible, now superfluous for reliability—though inflexible mindsets retire even more slowly. Many in Washington mouth the mushy mantra that climate urgency demands "all of the above." Actually, no: the more urgent climate change is, the more we must invest judiciously, not indiscriminately, to buy cheap, fast, sure options instead of **costly**, **slow**, **speculative ones**. Only this strategy saves the most carbon per dollar and per year. Anything else worsens climate change. So the next time you hear some official, eager to appease every constituency, say we support "all of the above—we're not picking and backing winners," remember the retort by the dean of U.S. utility regulators, Peter Bradford: "No, we're not picking and backing winners. They don't need it. We're picking and backing losers."

Nuclear energy will not save us from the climate crisis, but renewables will. That's better than their WNA evidence which is an association for nuclear, whereas this evidence is a Stanford professor.

Jacobson 24 [Mark Z. (Professor of Civil and Environmental Engineering & Director of the Atmosphere/Energy Program @ Stanford University), "7 reasons why nuclear energy is not the answer to solve climate change," OneEarth, Oct. 10, 2024, https://www.oneearth.org/the-7-reasons-why-nuclear-energy-is-not-the-answer-to-solve-climate-change/)]DOA 03-17-2025//abhi***Ellipsis in OG***

There is a small group of scientists that have proposed replacing 100% of the world's fossil fuel power plants with nuclear reactors as a way to solve climate change. Many others propose nuclear grow to satisfy up to 20 percent of all our energy (not just electricity) needs. They advocate that nuclear is a "clean" carbon-free source of power, but they don't look at the human impacts of these scenarios. Let's do the math... One nuclear power plant takes on average about 14-1/2 years to build, from the planning phase all the way to operation. According to the World Health Organization, about 7.1 million people die from air pollution each year, with more than 90 percent of these deaths from energy-related combustion. So switching out our energy system to nuclear would result in about 93 million people dying**, as we wait** for all the new nuclear plants to be built in the all-nuclear scenario. Utility-scale wind and solar farms, on the other hand, take on average **only two** to five years, from the planning phase to operation. Rooftop solar PV projects are down to only a 6-month timeline. So transitioning to 100% renewables as soon as possible would result in tens of millions fewer deaths. This illustrates a major problem with nuclear power and why renewable energy -- in particular Wind, Water, and Solar (WWS) -- avoids this problem. Nuclear, though, doesn't just have one problem. It has seven. Here are the seven major problems with nuclear energy: 1. Long Time Lag Between Planning and Operation The time lag between planning and operation of a nuclear reactor includes the times to identify a site, obtain a site permit, purchase or lease the land, obtain a construction permit, obtain financing and insurance for construction, install transmission, negotiate a power purchase agreement, obtain permits, build the plant, connect it to transmission, and obtain a final operating license. The planning-to-operation (PTO) times of all nuclear plants ever built have been 10-**19 years or more**. For example, the Olkiluoto 3 reactor in Finland was proposed to the Finnish cabinet in December 2000 to be added to an existing nuclear power plant. Its latest estimated completion date is 2020, giving it a PTO time of 20 years. The Hinkley Point nuclear plant was planned to start in 2008. It has an estimated the completion year of 2025 to 2027, giving it a PTO time of 17 to 19

years. The Vogtle 3 and 4 reactors in Georgia were first proposed in August 2006 to be added to an existing site. The anticipated completion dates are November 2021 and November 2022, respectively, given them PTO times of 15 and 16 years, respectively. The Haiyang 1 and 2 reactors in China were planned to start in 2005. Haiyang 1 began commercial operation on October 22, 2018. Haiyang 2 began operation on January 9, 2019, giving them PTO times of 13 and 14 years, respectively. The Taishan 1 and 2 reactors in China were bid in 2006. Taishan 1 began commercial operation on December 13, 2018. Taishan 2 is not expected to be connected until 2019, giving them PTO times of 12 and 13 years, respectively. Planning and procurement for four reactors in Ringhals, Sweden started in 1965. One took 10 years, the second took 11 years, the third took 16 years, and the fourth took 18 years to complete. Many claim that France's 1974 Messmer plan resulted in the building of its 58 reactors in 15 years. This is not true. The planning for several of these nuclear reactors began long before. For example, the Fessenheim reactor obtained its construction permit in 1967 and was planned starting years before. In addition, 10 of the reactors were completed between 1991-2000. As such, the whole planning-to-operation time for these reactors was at least 32 years, not 15. That of any individual reactor was 10 to 19 years. 2. Cost The levelized cost of energy (LCOE) for a new nuclear plant in 2018, based on Lazard, is $151 (112 to 189)/MWh. This compares with $43 (29 to 56)/MWh for onshore wind and $41 (36 to 46)/MWh for utility-scale solar PV from the same source. This nuclear LCOE is an underestimate for several reasons. First, Lazard assumes a construction time for nuclear of 5.75 years. However, the Vogtle 3 and 4 reactors, though will take at least 8.5 to 9 years to finish construction. This additional delay alone results in an estimated LCOE for nuclear of about $172 (128 to 215)/MWh, or a cost 2.3 to 7.4 times that of an onshore wind farm (or utility PV farm). Next, the LCOE does not include the cost of the major nuclear meltdowns in history. For example, the estimated cost to clean up the damage from three Fukushima Dai-ichi nuclear reactor core meltdowns was $460 to $640 billion. This is $1.2 billion, or 10 to 18.5 percent of the capital cost, of every nuclear reactor worldwide. In addition, the LCOE does not include the cost of storing nuclear waste for hundreds of thousands of years. In the U.S. alone, about $500 million is spent yearly to safeguard nuclear waste from about 100 civilian nuclear energy plants. This amount will only increase as waste continues to accumulate. After the plants retire, the spending must continue for hundreds of thousands of years with no revenue stream from electricity sales to pay for the storage. 3. Weapons Proliferation Risk The growth of nuclear energy has historically increased the ability of nations to obtain or harvest plutonium or enrich uranium to manufacture nuclear weapons. The Intergovernmental Panel on Climate Change (IPCC) recognizes this fact. They concluded in the Executive Summary of their 2014 report on energy, with "robust evidence and high agreement" that nuclear weapons proliferation concern is a barrier and risk to the increasing development of nuclear energy: Barriers to and risks associated with an increasing use of nuclear energy include operational risks and the associated safety concerns, uranium mining risks, financial and regulatory risks, unresolved waste management issues, nuclear weapons proliferation concerns, and adverse public opinion. The building of a nuclear reactor for energy in a country that does not currently have a reactor allows the country to import uranium for use in the nuclear energy facility. If the country so chooses, it can secretly enrich the uranium to create weapons-grade uranium and harvest plutonium from uranium fuel rods for use in nuclear weapons. This does not mean any or every country will do this, but historically some have and the risk is high, as noted by IPCC. The building and spreading of Small Modular Reactors (SMRs) may increase this risk further. 4. Meltdown Risk To date, 1.5 percent of all nuclear power plants ever built have melted down to some degree. Meltdowns have been either catastrophic (Chernobyl, Ukraine in 1986; three reactors at Fukushima Dai-ichi, Japan in 2011) or damaging (Three-Mile Island in 1979; Saint-Laurent France in 1980). The nuclear industry has proposed new reactor designs that they suggest are safer. However, these designs **are** generally **untested**, and there is no guarantee that the reactors will be designed, built, and operated correctly or that a natural disaster or act of terrorism, such as an airplane flown into a reactor, will not cause the **reactor** to **fail**, resulting in a major **disaster**. 5. Mining Lung Cancer Risk Uranium mining causes lung cancer in large numbers of miners because uranium mines contain natural radon gas, some of whose **decay products** are **carcinogenic**. A study of 4,000 uranium miners between 1950 and 2000 found that 405 (10 percent) died of lung cancer, a rate six times that expected based on smoking rates alone. 61 others died of mining-related lung diseases. Clean, renewable energy does not have this risk because (a) it does not require the continuous mining of any material, only one-time mining to produce the energy generators; and (b) the mining does not carry the same lung cancer risk that uranium mining does. 6. Carbon-Equivalent Emissions and Air Pollution There is no such thing as a zero- or close-to-zero emission nuclear power plant. Even existing plants emit due to the **continuous mining** and **refining** of **uranium** needed for the plant. **Emissions** from new nuclear are 78 to 178 g-CO2/kWh, not close to 0. Of this, 64 to 102 g-CO2/kWh over 100 years are emissions from the background grid while consumers wait 10 to 19 years for nuclear to come online or be refurbished, relative to 2 to 5 years for wind or solar. In addition, all nuclear plants emit 4.4 g-CO2e/kWh from the water vapor and heat they release. This contrasts with solar panels and wind turbines, which reduce heat or water vapor fluxes to the air by about 2.2 g-CO2e/kWh for a net difference from this factor alone of 6.6 g-CO2e/kWh. In fact, China's investment in nuclear plants that take so long between planning and operation instead of wind or solar resulted in China's **CO2 emissions increasing** 1.3 percent from 2016 to 2017 **rather than declining** by an estimated average of 3 percent. The resulting **difference in air pollution** emissions may have caused **69,000** **additional air pollution** **deaths** in China in **2016 alone**, with additional deaths in years prior and since. 7. Waste Risk Last but not least, consumed fuel rods from nuclear plants are radioactive waste. Most fuel rods are stored at the same site as the reactor that consumed them. This has given rise to hundreds of radioactive waste sites in many countries that must be maintained and funded for at least 200,000 years, far beyond the lifetimes of any nuclear power plant. The more nuclear waste that accumulates, the greater the risk of **radioactive leaks**, which can **damage water** supply, **crops**, **animals**, and **humans**.

CONTENTION 2:

8-17-2023, "U.S. uranium production up in 2022 after reaching record lows in 2021", No Publication, https://www.eia.gov/todayinenergy/detail.php?id=60160

Uranium concentrate (U_3O_8) production in the United States was nearly 10 times higher than the previous year in 2022, partly as a result of higher uranium prices. U.S. U_3O_8 production remained near historic lows despite operations resuming at the White Mesa Mill, the United States' only operating conventional uranium mill. Using different processes, five facilities in the United States produced U_3O_8 in 2022. Despite only reporting production in the last three months of 2022, White Mesa accounted for 84% of the U_3O_8 produced last year. The rest was produced at four in situ recovery facilities. White Mesa operates on a campaign basis; it only produces U_3O_8 as when mill feed, contract requirements, or market conditions warrant. It can also process other minerals, including rare earths. In 2021, White Mesa focused on ramping up rare earth carbonate production and didn't produce any U_3O_8.

Producing U_3O_8—often called yellowcake for its powdered, yellow appearance—is one of the first steps in making fuel for nuclear reactors. After uranium ore is mined, it goes through a milling process where uranium is extracted from the ore, producing U_3O_8, which is then processed at conversion and enrichment facilities. The enriched uranium is made into fuel pellets that are assembled into fuel rods for nuclear reactors.

In the 1940s and 1950s, the United States introduced financial incentives, procurement programs, and trade policies to help spur domestic uranium production. Domestic U_3O_8 production significantly declined in the 1980s as production incentives and subsidies ended, trade barriers were removed, and uranium prices fell. Since then, most of the uranium material supplied to U.S. nuclear plants has been imported.

The uranium material used in U.S. nuclear power reactors is largely imported because it's more abundant and cheaper to produce in other countries. In 2022, 95% of the uranium purchased by U.S. nuclear power plant operators originated in other countries. Canada, which has large, high-quality uranium reserves, was the largest source of uranium purchased by U.S. nuclear power plants in 2022 at 27%. Kazakhstan was the second-largest source at 25%, followed by Russia at 12%.

Although the United States banned imports of oil, natural gas, and coal from Russia following Russia's full-scale invasion of Ukraine in February 2022, uranium was not sanctioned.

The U.S. Department of Energy has announced its aim to increase domestic uranium production to reduce reliance on uranium imports. In 2020, Congress established a strategic uranium reserve, a stockpile of domestically produced uranium that serves as backup supply for U.S. nuclear power plants and incentivizes domestic uranium production. At the end of 2022, the U.S. Department of Energy awarded the first U_3O_8 supply contracts for the reserve, including one to White Mesa's operator, Energy Fuels.