# 1NR---DRR---Round 2

## K---Capitalism

### Sustainability

## Turn---Energy

### Grid---Impact---1NR

#### Outages go *global*---outweighs on magnitude from irreversibility.

Martin **Rees 18**, Astronomer Royal, founded the Centre for the Study of Existential Risk, Fellow of Trinity College and Emeritus Professor of Cosmology and Astrophysics at the University of Cambridge, “On the Future: Prospects for Humanity,” Princeton University Press

2.5. TRULY EXISTENTIAL RISKS?

Our world increasingly depends on elaborate networks: electricity power grids, air traffic control, international finance, globally dispersed manufacturing, and so forth. Unless these networks are highly resilient, their benefits could be outweighed by catastrophic (albeit rare) breakdowns— realworld analogues of what happened in the 2008 global financial crisis. Cities would be ~~paralysed~~ [gridlocked] without electricity— the lights would go out, but that would be far from the most serious consequence. Within a few days our cities would be uninhabitable and anarchic. Air travel can spread a pandemic worldwide within days, wreaking havoc on the disorganised megacities of the developing world. And social media can spread panic and rumour, and economic contagion, literally at the speed of light.

When we realise the power of biotech, robotics, cybertechnology, and AI— and, still more, their potential in the coming decades— we can’t avoid anxieties about how this empowerment could be misused. The historical record reveals episodes when ‘civilisations’ have crumbled and even been extinguished. Our world is so interconnected it’s unlikely a catastrophe could hit any region without its consequences cascading globally. For the first time, we need to contemplate a collapse— societal or ecological— that would be a truly global setback to civilisation. The setback could be temporary. On the other hand, it could be so devastating (and could have entailed so much environmental or genetic degradation) that the survivors could never regenerate a civilisation at the present level.

### Grid---Link---1NR

#### For reference. 1AC Burns.

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The administration’s latest moves will cast doubt on the agency’s independence, which erodes the bedrock upon which regulatory credibility, transparency, and certainty are based. And their timing couldn’t be worse: with advanced reactor projects moving forward in Wyoming, Texas, Tennessee, Virginia, and many other states, public trust in both the industry and its regulator is as important as ever.

Infringements upon NRC independence are not just abstract violations of principle, but would have real-world, practical effects. DOGE and OMB influence over safety requirements could result in violations of the Atomic Energy Act regarding the development and regulation of uses of nuclear materials facilities, and could provide a legal opening for anti-nuclear activists to challenge licenses, delaying projects and adding additional costs for developers.

Indeed, the very inclusion of OMB review runs counter to the goals of reform, leading to more inefficiency and uncertainty by creating a bottleneck in the licensing process and additional bureaucratic layers.

Such disruptions could also exacerbate what is arguably the most critical challenge for the US nuclear sector today: attracting capital and financing. Potential investors in nuclear are strongly averse to regulatory uncertainty and the potential liability stemming from negligent or compromised review processes. When regulatory predictability, reliability, and stability are sorely needed—for the industry broadly, for offtakers, for investors—breaches of agency independence would result in the exact opposite.

#### Without industry buy-in, even if the gov is good for renewables, nuclear crowds it out.

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The extent to which these changes could generate chaos and grind agency activity to a standstill—and the untimeliness of such developments—cannot be overstated. The NRC is in the midst of reviewing America’s leading advanced nuclear projects: in the last few months, the agency just began reviewing X-energy’s application for a construction permit and the Tennessee Valley Authority’s construction permit application for its BWRX-300 SMR project at Clinch River. It would also have the disastrous effect of further delaying long-awaited licensing and environmental review process reforms that are critical for advanced reactors.

Creating Negative International Ripple Effects

The wholesale disruption—not reform—of the NRC will also put America’s ability to export civil nuclear technologies at grave risk.

Perceptions of interference in the agency’s decision-making processes undermine other countries’ trust in the NRC and US technologies. One of the key advantages for US nuclear developers has been that they can credibly argue to international customers that a design licensed by an independent NRC has been rigorously vetted through objective, technical analysis. If our international partners have reason to doubt the NRC’s credibility or can no longer partner with the NRC on regulatory harmonization and training, we lose this key advantage over competitors in the international market.

### Grid---Link---AT: AI

#### More evidnece.

Darrell Proctor 25, senior associate editor for POWER Magazine, founder and president of DPro Enterprises, former Communications Strategist, Program Director and Energy Industry Consultant @ EUCI, former Energy Analyst @ McGraw Hill Financial, “Central Theme for Energy’s Future: Decentralizing Power Generation”, https://www.powermag.com/central-theme-for-energys-future-decentralizing-power-generation/

The use of distributed energy resources (DERs) will continue to grow as utilities, businesses, and residential neighborhoods look for ways to balance the power grid and support more reliable and resilient electricity.

The use of distributed energy resources (DERs) continues to grow as individuals and businesses look for more control of their energy costs and electricity supply. The use of on-site generation technologies, including solar panels, batteries, small wind turbines, and gas- and diesel-powered generators, is helping power customers mitigate the impacts of grid outages and high prices for electricity.

DERs help local utilities by contributing to a more resilient and sustainable power supply. Customers may have the opportunity to sell excess electricity back to the grid during periods of peak demand; in addition, DERs are the backbone of virtual power plants (VPPs) that are enabling utilities to better manage the power supply, and avoid the cost of building new physical power generation facilities.

The use of decentralized power production means utilities and their customers no longer have to rely on a single generation resource, but rather can utilize a variety of technologies to mitigate the impact of extreme weather and other issues. The use of DERs in microgrid configurations allows for a steady supply of energy in remote locations, an important consideration for military bases and other businesses with a need to operate in areas far from the traditional power grid.

“DER programs allow utilities to shave peak demand, balance supply and demand, and reduce energy losses during transmission and distribution, thus offering a far more stable and efficient grid for everyone. Utilities should not only be involved but further incentivize more adoptions, creating a more resilient, flexible, and economically efficient energy system,” said Shawn McLaughlin, CEO and founder of Emporia, a Colorado-based energy management solutions provider. “At the state level, utility incentive programs have led to growth in DER programs like solar rebate programs and efficiency loans, reduced costs for efficient or renewable technologies, and water conservation incentives. These programs further support technology and encourage more residential and commercial adoptions of smart energy technologies.”

Jeff Simmons, senior vice president at Toshiba America Energy Systems, said, “DERs are more than just a backup power. They’re shaping a more future-ready and resilient ecosystem that allows businesses and communities to better manage resources, reach their sustainability goals, and achieve long-term energy independence. There’s no doubt that distributed energy resources are revolutionizing the energy landscape by helping businesses and homes improve energy reliability, resilience, and sustainability. At Toshiba, we are working on advanced DER solutions and anticipate great potential in their growth.”

#### Every SMR attempt in history has been an abject failure.

Dr. Jim Green 24, PhD from the Department of Science & Technology Studies, University of Wollongong, Australia, wrote his thesis on Reactors, Radioisotopes & the HIFAR Controversy, works at Friends of the Earth, former editor of the World Information Service on Energy’s Nuclear Monitor newsletter, He is author of a detailed SMR briefing paper released in June 2023, “Small modular nuclear reactors: a history of failure”, https://www.climateandcapitalmedia.com/small-modular-nuclear-reactors-a-history-of-failure/

SMRs so far? Shut down

The history of small reactors is a history of failure. The U.S. Army built and operated eight small reactors beginning in the 1950s, but they proved unreliable and expensive and the program was shut down in 1977. In addition, 17 small civilian reactors were built in the US in the 1950s and 1960s, but all have since shut down.

Twenty-six small Magnox reactors were built in the U.K. but all have shut down and no more will be built. The only operating Magnox is a mini-Magnox in North Korea: the design was made public at an Atoms for Peace conference and North Korea uses its 5 MW Magnox to produce plutonium for nuclear weapons.

India operates 14 small pressurized heavy water reactors, each with a capacity of about 200 MW. Professor M.V. Ramana noted in his 2012 book, “The Power of Promise: Examining Nuclear Energy in India,” that despite a standardized approach to designing, constructing and operating these reactors, many suffered cost overruns and lengthy delays. There are no plans to build more of these small reactors in India.

Elsewhere, the history of small reactors is just as underwhelming. This includes three small reactors in Canada (all shut down), six in France (all shut down) and four in Japan (all shut down).

Ramana concludes his history of small reactors with this downbeat assessment: “Without exception, small reactors cost too much for the little electricity they produce, the result of both their low output and their poor performance.”

Just two SMR plants are said to be operating – neither meeting the “modular” definition of serial factory production of reactor components. These so-called SMRs exhibit familiar problems of massive cost blowouts and multi-year delays.

The construction cost of Russia’s floating twin-reactor plant increased six-fold and the OECD’s Nuclear Energy Agency estimates that the electricity it produces costs $200 per megawatt-hour (MWh). The reactor is used to power fossil fuel mining operations in the Arctic.

The other operating SMR – loosely defined – is China’s demonstration twin-reactor high-temperature gas-cooled reactor (HTGR). The World Nuclear Association states that the cost of the demonstration HTGR was $6,000 per kilowatt, three times higher than early cost estimates and two to three times higher than the cost of China’s larger Hualong reactors per kilowatt.

NucNet reported in 2020 that China dropped plans to manufacture 20 HTGRs after levelised cost estimates rose to levels higher than conventional large reactors. Likewise, the World Nuclear Association states that plans for 18 additional HTGRs at the same site as the demonstration HTGR have been “dropped”. China’s demonstration HTGR demonstrates yet again that the economics of small reactors doesn’t stack up.

Three SMRs are under construction – again with the qualification that there’s nothing ‘modular’ about these projects.

Argentina’s CAREM reactor has been a disaster. Construction began in 2014 and the National Atomic Energy Commission now hopes to complete the reactor in 2027 ‒ nearly 50 years after the project was conceived. The cost estimate in 2021 was $750 million for a reactor with a capacity of just 32 MW. That’s a huge expense for a reactor with the capacity of a handful of large wind turbines.

#### Treat all their SMR evidence as nuclear-bro boosterism---it’s shameless hype.

Dr. Ed Lyman 24, PhD from Cornell, Director of Nuclear Power Safety with the Union of Concerned Scientists, internationally recognized expert on nuclear proliferation and nuclear terrorism as well as nuclear power safety and security, member of the Institute of Nuclear Materials Management, and has testified numerous times before Congress and the Nuclear Regulatory Commission, “Five Things the “Nuclear Bros” Don’t Want You to Know About Small Modular Reactors”, https://blog.ucsusa.org/edwin-lyman/five-things-the-nuclear-bros-dont-want-you-to-know-about-small-modular-reactors/

Even casual followers of energy and climate issues have probably heard about the alleged wonders of small modular nuclear reactors (SMRs). This is due in no small part to the “nuclear bros”: an active and seemingly tireless group of nuclear power advocates who dominate social media discussions on energy by promoting SMRs and other “advanced” nuclear technologies as the only real solution for the climate crisis. But as I showed in my 2013 and 2021 reports, the hype surrounding SMRs is way overblown, and my conclusions remain valid today.

Unfortunately, much of this SMR happy talk is rooted in misinformation, which always brings me back to the same question: If the nuclear bros have such a great SMR story to tell, why do they have to exaggerate so much?

What are SMRs?

SMRs are nuclear reactors that are “small” (defined as 300 megawatts of electrical power or less), can be largely assembled in a centralized facility, and would be installed in a modular fashion at power generation sites. Some proposed SMRs are so tiny (20 megawatts or less) that they are called “micro” reactors. SMRs are distinct from today’s conventional nuclear plants, which are typically around 1,000 megawatts and were largely custom-built. Some SMR designs, such as NuScale, are modified versions of operating water-cooled reactors, while others are radically different designs that use coolants other than water, such as liquid sodium, helium gas, or even molten salts.

To date, however, theoretical interest in SMRs has not translated into many actual reactor orders. The only SMR currently under construction is in China. And in the United States, only one company—TerraPower, founded by Microsoft’s Bill Gates—has applied to the Nuclear Regulatory Commission (NRC) for a permit to build a power reactor (but at 345 megawatts, it technically isn’t even an SMR).

### Grid---Link---AT: Author Indict

#### Centralized power only serves to prop up political control by corporate mega-utilities. Reject their authors---they’re shills for the nuclear industry. AND---the centralized grid construct causes extinction.

Harvey Wasserman 16, adjunct instructor of history at Hampshire College, master’s degree from the University of Chicago, former senior advisor to Greenpeace USA, “‘The Real Battle Is, Who’s Going to Own the Energy Supply?’”, http://fair.org/home/the-real-battle-is-whos-going-to-own-the-energy-supply/

HW: Well, I did a very elaborate article on EcoWatch.com, which people might want to look at, dissecting this piece. Because it was so twisted, and it really requires that you go just one step below. These guys running around defending nuclear power aren’t just defending nuclear power. What they’re really about is protecting the grid, which is corporate-owned and corporate-controlled, and the real battle here in the energy world is who’s going to own the energy supply. Is it going to be the corporations with their centralized grid and these coal, oil, nuke and gas burners, or is it going to be the public with a decentralized post-grid reality that’s based on solar panels and, to a certain extent, wind and biofuels and all the other stuff that you can do on a decentralized basis?

And that’s really what the bigger battle is about. And, of course, the grid and the fossil nuclear industry are not ecologically sustainable, and they do mean the end of the Earth. Whereas the decentralized grid, we can balance it in harmony with Mother Nature, and build technologies or use technologies that work in harmony with the planet, and maybe we can actually survive.

### Grid---Link---AT: Microgrids

#### The two power paradigms are fundamentally incompatible.

Dr. Enrique Dans 23, PhD from UCLA, Professor of Innovation at IE Business School, “Here’s another, often overlooked reason why nuclear energy is a bad thing”, https://medium.com/enrique-dans/heres-another-often-overlooked-reason-why-nuclear-energy-is-a-bad-thing-6522371f5e4f

This conclusion, which disproves the arguments of the pro-nuclear lobby, is due precisely to the effect that the stable production of nuclear power plants has on the electricity market: extending the useful life of nuclear power plants, in addition to the huge drain on the public purse (what government can ignore the blackmail threats about security and safety?) would have seriously discouraged investment in renewable energies in the country.

Nuclear power plants and their inflexible output cause congestion in the power grid and in domestic markets, and that is precisely the opposite of what is needed for wind and solar power to make sense. In other words, nuclear power plants and their extreme rigidity are incompatible with the modern, flexible grid systems we will have in the future, which will be supplied by renewable energies. No dangers, no waste problems and no periodic injections of public money.

This is why Europe’s ACER, the Agency for the Cooperation of Energy Regulators, wants to modify the intraday gate opening schedules for different capacity calculation regions, due to the potential of offering spare day-ahead inter-zonal capacity (which now fluctuate more widely due to the greater variations experienced by renewable generation systems). Whether that market is attractive to companies offering renewables is an inverse function of the amount of nuclear power offered in each market: less nuclear power means more gaps to fill with cheap, clean, safe power, and more incentives for companies investing in renewables to recoup their investment.

Even in pro-nuclear France there is strong opposition to the development of a new nuclear program, not from the public, but by eight hundred relevant scientists in the field. The reason is clear: more nuclear power plants, in addition to greater danger and a major waste problem which, let’s not deceive ourselves, no one has been able to solve satisfactorily, implies a delay in the development of the energy generation that we really need in the future: renewable energy.

The economic viability of a nuclear plant is very difficult to demonstrate if we take into account all the costs involved. Since the inception of commercial nuclear power, the industry has been propped up by huge government subsidies, which is what the companies involved actually live off. Putting more tax-payers’ money into nuclear power will make it neither safer, cleaner, nor cheaper in real terms. But in addition, such subsidies to a mature industry distort electricity markets by giving nuclear power an unfair and undesirable advantage over truly clean and safe energy alternatives, and discourage the investment that really defines the future of energy.

The only people who want more nuclear power are those who make their living from it. Make no mistake and don’t buy their arguments or believe what their lobbyists say. It’s all a pack of lies.

#### Investment link---institutional lenders will scrap capital plans on the perception of the plan *alone*---Australia proves.

Elouise Fowler 24, holds a J.D. from Australian National University (ANU), “Nuclear to wreak ‘catastrophic damage’ on renewable energy”, https://www.afr.com/companies/energy/nuclear-to-wreak-catastrophic-damage-on-renewable-energy-20240620-p5jnfb

Opposition Leader Peter Dutton’s proposed nuclear power plants and junking of emission reduction targets risks “catastrophic damage” to billions of dollars of planned investment in clean energy and blots Australia’s reputation as a leader in the green economy transition, say two peak bodies for renewable energy investors.

Building a nuclear industry from scratch was incompatible with a “timely and cost-efficient” energy transition, warned the Clean Energy Investor Group (CEIG), which represents 18 domestic and international investors with a combined Australian portfolio of over $38 billion and more than 76 clean energy assets under management.

“If taken seriously, this proposal and the posturing by the Coalition on scrapping Australia’s emissions reduction target under the Paris Agreement have the potential to do catastrophic damage to investor confidence,” said Kane Thornton, head of the Clean Energy Council, which represents 900 local renewable energy and energy storage businesses.

Mr Dutton last week junked the government’s legislated targets of 43 per cent emissions reduction on 2005 levels by 2030, in the lead-up to the nuclear policy announcement on Wednesday.

His proposal includes building a fleet of government-owned reactors, the first of which would be up and running by 2035, the second by 2037 and the remaining five online by 2050, all at former or existing coal-power generator sites.

The aim is to sidestep the major stumbling block of building new transition to connect renewables. The scheme is uncosted and requires agreement from east coast state governments, which this week were quick to rule out any reactors within their borders.

Some senior Coalition members, such as David Littleproud and Keith Pitt, also warn that renewable energy should be scaled back and coal extended until nuclear comes online.

Given the uncertainty this has injected into the market, the CEIG – whose members include US investment giant BlackRock, French utility Neoen and Macquarie – warned on Thursday that investors may “reassess their positions” and back away from investment decisions.

“A stable and predictable policy environment is essential for attracting and retaining the significant capital required to achieve our renewable energy targets,” said Marilyne Crestias, interim chief executive of CEIG.

“Substantial changes of policy direction would risk derailing the momentum we have built for Australia’s decarbonisation journey.”

### Grid---Link---AT: Nuclear Key

#### Renewables don’t need “baseload” power that can’t ramp up and down, they need battery storage and microgrids. The ‘complement’ thesis is total nonsense.

Paul Hockenos 22, Fellow at the American Academy in Berlin, prize-winning author of five books on European politics and culture, holds a master’s degree in social and political Thought from the University of Sussex, “Nuclear Power Is a Dead End. We Must Abandon It Completely”, https://www.thenation.com/article/world/nuclear-power-europe-energy/

Nuclear and renewables don’t mix

Finally, the last claim of nuclear supporters is that the massive baseload supply that reactors provide when they’re up and running is just what systems reliant on weather-based renewables need at down times. In fact, nuclear is the opposite of what decentralized clean energy systems require.

Renewables and nuclear energy don’t mix well in one system, explains Toby Couture of the Berlin-based think tank E3 Analytics. “What renewables need is not so-called baseload power,” he told me, “which is inflexible and unable to ramp up and down, but flexible, nimble supply provided by the likes of storage capacity, smart grids, demand management, and a growing toolbox of other mechanisms, not the large and inflexible supply of nuclear reactors.”

Couture added, “The inability of nuclear power to ramp down effectively to ‘make room’ for cheap wind and solar is one of the main reasons why France’s own domestic renewable energy development has lagged behind its peers.” According to Couture, France’s inability to flexibly accommodate wind and solar has exacerbated the continent-wide power supply crunch.

#### Plus, nuclear sucks ass at providing baseload power anyway.

Dr. Luke Haywood et al. 23, head of climate and energy at the European Environmental Bureau (EEB) in Brussels and guest researcher at the Mercator Research Centre on Global Commons and Climate Change and at the German Institute for Economic Research (DIW Berlin), institutions where he previously held postdoc positions, holds a PhD from the Paris School of Economics, “Why investing in new nuclear plants is bad for the climate”, Joule, Volume 7, Issue 8, 2023, Pages 1675-1678, ISSN 2542-4351, https://doi.org/10.1016/j.joule.2023.07.006

Baseload and flexibility

While renewables may have become a lot cheaper, it is sometimes argued that current electricity market design does not value security of supply. Nuclear, the argument goes, provides stable baseload electricity that is a valuable contribution to a generating mix.

This raises two questions: first, can nuclear reliably produce baseload? Second, how valuable is baseload? Regarding the first question: nuclear is not entirely reliable. This was evident in France in late autumn of 2022: although the EU was in a period of limited electricity supply with frequent electricity price spikes above 3€/kWh, around half of France’s 56 reactors were unavailable due to planned and unplanned outages. Climate change is likely to increase episodes of extreme heat, low river flows, and associated problems of cooling nuclear power plants at short notice (Ahmad11). More importantly, regarding the second question, flexibility rather than baseload production is required to balance an electricity system based on renewables. However, ramping-up a nuclear power plant is slow. Also, the cost composition of nuclear power does not fit the role of backup technology for power systems with high shares of wind and solar. Such systems will have low electricity prices for a large part of the year and very high electricity prices for a few to several hundred hours of the year, leading to uncertain and strongly varying revenues for a backup technology. Such a revenue profile is best suited for a technology with low capital costs and high variable costs—in a year with high demand, revenues will be higher, thus covering higher variable costs, and vice versa. Nuclear costs are mostly up front, so the technology is best suited for stable and predictable revenue streams. While renewables’ production is variable, their generation can be matched to demand by storing renewable electricity in the form of hydrogen, using batteries or pumped hydro. Bloomberg reports that the price of battery storage has fallen from $1,220 to $132 per kWh between 2010 and 2021. Beyond batteries, demand- and supply-side grid flexibility technologies can complement variable renewable energy sources at generally lower cost than fossil-fuel backup or bulk storage—consumers may also help reduce system costs by adapting their electricity consumption to the availability of renewable energy. Shirizadeh et al.12 find that costs of storing variable renewable electricity production appear manageable, with storage costs of less than 15% of total costs associated with a fully renewable electricity grid for France. Pietzcker et al.1 find that new nuclear constructions would not decrease the costs of achieving EU climate targets. Shirizadeh and Quirion13 find that a 100% renewable system is very cost-effective for France. Shirizadeh et al.12 note that while the optimal combination of different renewable generation technologies depends strongly on the cost parameters for these different technologies, the resulting cost of the renewable mix is fairly robust.

#### It's slower to ramp up and down than coal.

Victor Ahlqvist et al. 22, Senior Economist at Copenhagen Economics, holds an MSc in Economics from the Lund University School of Economics and Management, “A survey comparing centralized and decentralized electricity markets”, https://www.sciencedirect.com/science/article/pii/S2211467X22000128

It is challenging to continuously keep the system in balance. The electricity demand is often price-insensitive; for instance, many households pay a fixed price that does not fluctuate from hour to hour. Still, consumers are free to suddenly increase or decrease consumption without notice, regardless of whether the system frequency is approaching its boundary. Similarly, variable renewable energy is intermittent by nature, changing unpredictably from 1 min to the next. Besides these challenges, technical network and production constraints must be considered. For example, there are ramp-rate constraints, which restrict how quickly producers can increase and decrease their output. It normally takes 5–30 min to ramp up a thermal plant from minimum to nominal production. Ramping is particularly slow in coal plants, where the thermal stress due to temperature variations is often the limiting factor. Often ramping is even slower in nuclear power plants. The minimum production is typically 20–60% of nominal output for thermal plants. This is to ensure that the flame is stable. Other intertemporal constraints are costs involved in turning the plant on, the start-up cost, and a fixed cost of operation, the no-load cost. The intertemporal constraints imply that the cost of producing during 1 h depends on the output in adjacent hours.1 One issue with the fixed cost is that the average production cost would be decreasing in some output intervals. Such non-convexities imply that a producer may require a price above its marginal cost in those intervals to avoid making a loss. To manage all of these issues and to achieve a feasible and efficient allocation, electricity production is coordinated by a system operator when electricity is delivered.

#### For the ‘complement’ thesis to be true, nuclear fleets would have to perform at levels they have never achieved in history, *ever*.

Craig Morris 18, Contributing Editor of Renewables International and lead author at EnergyTransition.de, co-author of Energy Democracy, the first history of Germany’s Energiewende, served as editor of IRENA’s REmap report and Greenpeace’s Energy (R)evolution in addition to translating several major German books on renewables into English, he won the IAEE prize for journalism in energy economics, “Can nuclear and renewables coexist?”, https://energytransition.org/2018/03/can-nuclear-and-renewables-coexist/

In the end, how you come down on this issue is a matter of faith: do you believe that an entire reactor fleet can ramp at each reactor’s technical limit regularly two thirds of the time (outside of times close to refueling) when, after four decades, no fleet has ever done so, including at times of negative power prices?

We need a lot more research and open discussion about the particular behavior of nuclear reactors ramping – and possible wear and tear on the facilities. My discussion paper is an invitation: let’s discuss. Based on what I found, I contend that existing nuclear is incompatible with significant shares of wind and solar. You either stick with nuclear, or you build wind and solar – and then nuclear has to go. A mix will not work; you have to choose.

### Grid---U---1NR

### Grid---U---AT: Global

#### But regardless---shift to decentralized renewables is happening globally.

WIPO 25, World Intellectual Property Organization, one of the 15 agencies of the United Nations, “The Energy Transition is for Everyone: the Rise of Decentralized Energy for a Cleaner, Smarter Future”, https://www3.wipo.int/wipogreen/en/news/2025/news\_0001.html

The energy transition is for everyone

A shift is underway from a more centralized, top-down energy system to a distributed, decentralized model where individuals, communities, and businesses can generate, store, and manage their own energy.

Technological innovation in decentralized clean energy production is playing a significant role in democratizing the energy transition. This is a key message emerging from the latest edition of WIPO’s Green Technology Book, launched at the 29th Conference of the Parties (COP 29) to the United Nations Framework Convention on Climate Change (UNFCCC) in Baku, Azerbaijan.

Decentralized energy resources (DERs) are small-scale power generation systems, like solar panels, wind or water turbines, or home battery storage, that produce and manage energy right where it is used. Instead of relying on a distant power plant and distribution network, these technologies give individuals, communities, and businesses the power to generate and control their own energy.

Remarkably, the shift to decentralized energy production is occurring across developed and developing countries alike. It also transcends the urban-rural divide. Communities can now collectively invest in renewable energy and enabling technologies, including solar, energy storage systems and smart metering.

### Accidents---Impact---1NR

### Accidents---AT: Warming Turns

#### Only renewables can truly solve warming.

Dr. John P. Slattery 25, PhD from the University of Notre Dame, executive director of the Grefenstette Center for Ethics in Science, Technology, and Law at Duquesne University, “A Nuclear Future is Not Inevitable”, https://www.commonwealmagazine.org/nuclear-power-amazon-microsoft-trump-biden-slattery-ai

When politicians and companies talk about nuclear power, they use language of inevitability and necessity. There is no other way to become carbon neutral, they argue. Nuclear power guarantees reliability and longevity in a way that no other power source can offer. The technology, argues its defenders, has come so far that the new reactors will be safe and environmentally friendly. The math behind nuclear energy is compelling: a single kilogram of enriched uranium can produce as much energy as 88 tons of coal, 47 tons of natural gas, and 66 tons of oil. For the same amount of energy, nuclear plants produce around two percent of the emissions of fossil fuels. On paper, it is an easy sell, but we should not be so easily convinced.

The science is clear: renewable energy sources like wind turbines, solar panels, geothermal vents, and hydroelectric plants remain the only true hope for a long-term future of stabilizing the climate and producing plentiful energy while keeping our air and water clean. Renewable energy projects, compared to nuclear power, are relatively simple to construct and to scale, from rooftop solar panels to hilltop wind turbines. A recent study showed that there are enough renewable-energy projects proposed today that would meet the entire national demand for energy by 2035 if the impediments were removed. These impediments include an aging power grid, bloated algorithmic models, corporate interests protecting the fossil-fuel industry, and the lack of federal willpower to overcome regulatory bottlenecks.

#### Nuclear actively trades off with renewables, which are better at hitting urgent climate targets.

Joscha Weber 21, Head of Fact-Checking and the Content Hub at Deutsche Welle, holds a master’s degree from the University of Münster, “Fact check: Is nuclear energy good for the climate?”, https://www.dw.com/en/fact-check-is-nuclear-energy-good-for-the-climate/a-59853315

Could we rely on nuclear energy to help stop global warming?

Around the world, nuclear energy representatives, as well as some politicians, have called for the expansion of atomic power. In Germany, for example, the right-wing populist AfD party has backed nuclear power plants, calling them "modern and clean." The AfD has called for a return to the energy source, which Germany has pledged to phase out completely by the end of 2022.

Other countries have also supported plans to build new nuclear plants, arguing that the energy sector will be even more damaging for the climate without it. But Wealer from Berlin's Technical University, along with numerous other energy experts, sees takes a different view.

"The contribution of nuclear energy is viewed too optimistically," he said. "In reality, [power plant] construction times are too long and the costs too high to have a noticeable effect on climate change. It takes too long for nuclear energy to become available.”

Mycle Schneider, author of the World Nuclear Industry Status Report, agrees.

"Nuclear power plants are about four times as expensive as wind or solar, and take five times as long to build," he said. "When you factor it all in, you're looking at 15-to-20 years of lead time for a new nuclear plant."

He pointed out that the world needed to get greenhouse gases under control within a decade. "And in the next 10 years, nuclear power won't be able to make a significant contribution," added Schneider.

"Nuclear power is not being considered at the current time as one of the key global solutions to climate change," said Antony Froggatt, deputy director of the environment and society program at the international affairs think tank Chatham House in London.

He said a combination of excessive costs, environmental consequences and lack of public support were all arguments against nuclear power.

Nuclear funding could go toward renewables

Due to the high costs associated with nuclear energy, it also blocks important financial resources that could instead be used to develop renewable energy, said Jan Haverkamp, a nuclear expert and activist with environment NGO Greenpeace in the Netherlands. Those renewables would provide more energy that is both faster and cheaper than nuclear, he said.

"Every dollar invested in nuclear energy is therefore a dollar diverted from true urgent climate action. In that sense, nuclear power is not climate-friendly," he said.

### Accidents---Link

#### 1---Mining---scaling up nuclear power spikes demand for uranium---devastates the environment.

Samuel M. McDonald 21, holds a Master of Environmental Management degree from Yale University, PhD Candidate at Oxford's School of Geography and the Environment, geographer and author of the forthcoming book Progress whose writing has appeared in Current Affairs, The New Republic, and The Guardian, among other publications, “Is Nuclear Power Our Best Bet Against Climate Change?”, https://www.bostonreview.net/articles/is-nuclear-power-our-best-bet-against-climate-change/

Another limitation of nuclear power is that it is not a long-term solution, in one crucial respect: it depends on fissile materials that are nonrenewable, namely uranium-233, uranium-235, and plutonium. At current rates of consumption, there may be between 130 and 230 years of recoverable uranium available globally. Derek Abbott, Professor of Electrical and Electronic Engineering at the University of Adelaide, has calculated that scaling nuclear production up to meet global demand could leave just five years of uranium supplies. Some experimental technology aims to use thorium instead, and optimistic speculation suggests that it could increase the supply of fissile material considerably. There are no commercially operating thorium reactors, and there are not likely to be in the near- and medium-term. There’s also the possibility of accessing underwater reserves of uranium, which could increase availability as well, but this technology is also far from deployable. In the end, all these technologies still use fissile fuel—including thorium—that is ultimately nonrenewable. (Other technological prospects include using spent fuel as an energy source, but these proposals, too, are experimental and not currently scalable.)

Beyond renewability, another important aspect of the debate concerns safety. Nuclear energy is often touted by advocates as the “cleanest” and “safest” energy source because of its lack of carbon emissions. There are many other environmental problems associated with nuclear energy, however, that call into question the precise meaning of these claims. Put another way, one could ask, for whom is nuclear clean and safe? Uranium mining is highly environmentally destructive, combining all the dangers of mining in general—like blasting and drilling huge tracts of land—with the added danger of radioactive waste rock and mill tailings (an ore residue left behind as a waste product). Environmental journalist David Thorpe calculates that “To produce the 25 tonnes or so of uranium fuel needed to keep your average reactor going for a year entails the extraction of half a million tonnes of waste rock and over 100,000 tonnes of mill tailings. These are toxic for hundreds of thousands of years.” Miners and those living near mines will be at risk, regardless of any potential technological innovations.

#### Large-scale uranium mining causes extinction.

Dave Sweeney 17, Policy Analyst at the Australian Conservation Foundation, founder of the 2017 Nobel Peace Prize winning global organization, ICAN, “The bigger picture: Why your voice on nuclear matters”, https://www.acf.org.au/nukes\_why\_your\_voice\_on\_nuclear\_matters

Uranium mining and radioactive waste pollute air, soil and water. Radiation can damage the genetic and reproductive systems of plants, animals and people. All of Australia’s operating uranium mines have a history of leaks, spills and accidents – and none have been properly rehabilitated.

This is part of the bigger story of pollution and extinction which threatens life on Earth.

#### Greater reliance on nuclear power makes catastrophic accidents inevitable *globally*.

Dr. Robert J. Lifton 19, lecturer at Columbia University, formerly Distinguished Professor of Psychiatry and Psychology, The City University of New York and Director of the Center on Violence and Human Survival at John Jay College of Criminal Justice, having held a research professorship of psychiatry at Yale University for more than two decades, has received dozens of prestigious awards, and no less than 12 honorary degrees, active member of Physicians for Social Responsibility since 1962 and is a founding member of the International Physicians for the Prevention of Nuclear War, also with Naomi Oreskes, “The false promise of nuclear power in an age of climate change”, https://thebulletin.org/2019/08/the-false-promise-of-nuclear-power-in-an-age-of-climate-change/

But there are deeper problems that should not be brushed aside. They have to do with the fear and the reality of radiation effects. At issue is what can be called “invisible contamination,” the sense that some kind of poison has lodged in one’s body that may strike one down at any time—even in those who had seemed unaffected by a nuclear disaster. Nor is this fear irrational, since delayed radiation effects can do just that. Moreover, catastrophic nuclear accidents, however infrequent, can bring about these physical and psychological consequences on a vast scale. No technological system is ever perfect, but the vulnerability of nuclear power is particularly great. Improvements in design cannot eliminate the possibility of lethal meltdowns. These may result from extreme weather; from geophysical events such as earthquakes, volcanoes, and tsunamis (such as the one that caused the Fukushima event); from technical failure; and from unavoidable human error. Climate change itself works against nuclear power; severe droughts have led to the shutting down of reactors as the surrounding waters become too warm to provide the vital cooling function.

Advocates of nuclear energy invariably downplay the catastrophic events at Fukushima and Chernobyl. They point out that relatively few immediate deaths were recorded in these two disasters, which is true. But they fail to take adequate account of medical projections. The chaos of both disasters and their extreme mishandling by authorities have led to great disparity in estimates. But informed evaluations in connection with Chernobyl project future cancer deaths at anywhere from several tens of thousands to a half-million.

Studies of Chernobyl and Fukushima also reveal crippling psychological fear of invisible contamination. This fear consumed Hiroshima and Nagasaki, and people in Fukushima painfully associated their own experiences with those of people in the atomic-bombed cities. The situation in Fukushima is still far from physically or psychologically stable. This fear also plagues Chernobyl, where there have been large forced movements of populations, and where whole areas poisoned by radiation remain uninhabitable.

The combination of actual and anticipated radiation effects—the fear of invisible contamination—occurs wherever nuclear technology has been used: not only at the sites of the atomic bombings and major accidents, but also at Hanford, Washington, in connection with plutonium waste from the production of the Nagasaki bomb; at Rocky Flats, Colorado, after decades of nuclear production; and at test sites in Nevada and elsewhere after soldiers were exposed to radiation following atomic bomb tests.

Nuclear reactors also raise the problem of nuclear waste, for which no adequate solution has been found despite a half-century of scientific and engineering effort. Even when a reactor is considered unreliable and is closed down, as occurred recently with the Pilgrim reactor in Plymouth, or closes for economic reasons, as at Vermont Yankee, the accumulated waste remains at the site, dangerous and virtually immortal. Under the 1982 Nuclear Waste Policy Act, the United States was required to develop a permanent repository for nuclear waste; nearly 40 years later, we still lack that repository.

Finally there is the gravest of dangers: plutonium and enriched uranium derived from nuclear reactors contributing to the building of nuclear weapons. The technology needed to enrich uranium to commercial reactor grade can easily be scaled up to enrich uranium to weapons grade. When commercial uranium reactors operate, the fissioning of their fuel produces plutonium, which ends up in the high-level radioactive waste. Wherever extensive nuclear power is put into use there is the possibility of its becoming weaponized. Of course, this potential weaponization makes nuclear reactors a tempting target for terrorists.

There are now more than 450 nuclear reactors throughout the world. If nuclear power is embraced as a rescue technology, there would be many times that number, creating a worldwide chain of nuclear danger zones—a planetary system of potential self-annihilation. To be fearful of such a development is rational. What is irrational is to dismiss this concern, and to insist, after the experience of more than a half-century, that a “fourth generation” of nuclear power will change everything.

#### Even limited radioactive leakage *poisons the planet*.

Dr. Cristian Bonacic et al. 23, DPhil in Zoology from Oxford, Professor in the Department of Ecosystems & The Environment, School of Agriculture and Forestry, Pontifical Catholic University of Chile, “Scientists warning on the ecological effects of radioactive leaks on ecosystems”, Front. Ecol. Evol. , 19 January 2023, Sec. Conservation and Restoration Ecology, Volume 10

A nuclear leakage or tactical nuclear weapon use in a limited war could cause immense and long-lasting ecological consequences beyond the direct site of exposure. We call upon all scientists to communicate the importance of the environmental impacts of such an event to all life forms on Earth, including humankind. Changes to ecosystem structure and functioning and species extinctions would alter the biosphere for an unknown time frame. Radiation could trigger cascade effects in marine, atmospheric and terrestrial ecosystems of a magnitude far beyond human capabilities for mitigation or adaptation. Even a “tactical nuclear war” could alter planet Earth’s living boundaries, ending the current Anthropocene era.

One sentence summary

We describe the devastating effects of nuclear radiation and its long-lasting consequences on Earth’s ecosystems.

Main text

Recent events related to the armed conflict in Ukraine have been linked to the possibility of radioactive leaks, the risk of using “tactical nuclear bombs,” or even full-scale nuclear war. The shelling of the Zaporizhzhia Nuclear Power Plant represents a particular risk. As environmental scientists, ecologists, and conservationists from all corners of the world, we would like to call upon all scientists to communicate the risks associated with radiation to the public and policymakers. We must be proactive and explain to our people the stark implications of an accidental nuclear leak, the use of tactical bombs, or a full-scale nuclear war if any of these were to happen. Our ethical and professional duty is to communicate the multiple potential consequences to life on Earth, including humankind. We propose a key summary of facts to communicate our concerns to leaders, stakeholders, and society effectively.

In any socioecological system, many variables, components, and processes can be affected by human intervention. Radiation leakage and nuclear explosions can severely affect natural (and anthropogenic) systems. Adding a major disturbance to the intrinsic uncertainty and unpredictability of these systems (Battisti et al., 2016). Any nuclear explosion can trigger ecological consequences far beyond the site where it occurs. Nuclear weapons can release massive radiation with total burdens of radionuclides amounting to millions of curies of strontium, cesium, plutonium, and carbon (Leaning, 2000; Pereira et al., 2022). Those consequences are long-lasting, affect ecosystem structure and function, lead to decline and local extinctions, severely hamper life on Earth, and reduce opportunities for humans to sustain our civilization (Leaning, 2000; Burkitbayev et al., 2011).

#### But even one accident zeroes the case---erodes public support.

Nikki Yeo 24, Fellow at NYU Shanghai, citing Claude Guet, a professor, “Advancements in nuclear energy have made it safer but public fear remains stumbling block”, https://www.channelnewsasia.com/today/big-read/nuclear-energy-perception-reality-safety-fear-4667916, \*language edited

Dr. Claude Guet, a visiting professor at the Nanyang Technological University (NTU) empathised with the public's fears: “Even if an accident is very unlikely, if there is an accident, it will have dramatic consequences, maybe not so much in the number of casualties. But it will have a big social, economic and political impact, and on public acceptance, so you have to balance this."

Indeed, after 13 years, Japanese authorities are still dealing with the aftermath of [Fukushima] the disaster, in which a tsunami caused by an earthquake ~~crippled~~ [damaged] the plant.

#### Bioaccumulation of nuclear waste ends humanity.

Russell Smith 15, “Regarding Docket ID NRC-2015-0057”, https://www.nrc.gov/docs/ML1523/ML15239A875.pdf

Instead of trying to promote idiotic theories about the "safety" of radiation fallout, our country should shut down the deadly industry. What good is trying to prevent global warming if your method is to produce death dealing radiation that lasts for millions of years? We are killing the human race swiftly and putting the burden on our descendants to fix our mess. That task of "fixing" the issues of nuclear accidents is becoming an impossible task.

They can't even keep robots functioning in the hostile ruins of Fukushima Daiichi. Why should we believe humans are not being affected in similar ways? Nuclear proponents have a great advantage in denying effects of an invisible toxin. But science does teach us that radiation kills. Marie Curie and her daughter died horribly from radiation. I guess hormesis didn't work out so well for them.

Spend your efforts in phasing out leaking obsolete nuclear plants before it is too late. The nuclear power industry has constructed nuclear plants with poor future planning to dispose of nuclear waste. They are accumulating millions of 100,000 year dangerous spent fuel rods which are terribly dangerous left in poorly shielded buildings and even when casked the spent fuel rods will be a burden to reshield again and again for a million years.

Why put that burden on our descendants? The nuclear industry has a lot of gall asking for additional safety exemptions when the scientific proof of deleterious radiation fallout human health effects is readily available right now in Fukushima Prefecture. I say it is readily available, but those health statistics on infant mortality and birth defects will not be disclosed because the Japanese authorities have invoked the State Secrets Act and most negative news about human illnesses has been severely repressed.

Make no mistake about it...suppressing the truth will come back to haunt the perpetrators. They will not escape the verdict of history.

In closing please remember the family left behind by Theodore Holcomb, killed by radiation in Japan he received while serving on the USS Ronald Reagan. Hormesis did not help save him. Radioactive poisons are not a medicine for humans. Trillions of dead sea creatures in the Kuroshio Current from Fukushima Daiichi are blatant evidence that radiation kills life forms. We are next.

### Accidents---Link---AT: SMRs

#### SMRs trigger peak uranium---forces a transition to in-situ leaching, which devastates groundwater across the planet---AND causes reprocessing.

Lynda Williams 24, Tenured Professor of Physics at SRJC, holds an M.S. in Physics from San Francisco State University, “Nuclear Propaganda Exposed: The Dirty Truth Behind Government and Industry Claims”, https://www.commondreams.org/opinion/nuclear-power-climate-change

The Peak Uranium Crisis

In addition to the delayed deployment of SMRs, high-grade uranium resources are finite, with estimates suggesting they may only last another 10 to 15 years at current consumption rates. This means that SMRs could face fuel shortages before they even become widespread. As high-grade deposits run dry, the industry may turn to in-situ leaching (ISL) methods, which pose severe environmental risks, particularly groundwater contamination. Furthermore, reprocessing nuclear waste—an extremely hazardous and costly endeavor—is not currently practiced in the U.S. due to its dangers. However, as peak uranium approaches, reprocessing may be reconsidered as a necessary but risky solution.

#### Groundwater contamination causes extinction.

Mattia Sacco et al. 23, PhD, Lecturer in Ecology at the School of Molecular and Life Sciences (MLS) of Curtin University, “We rely heavily on groundwater — but pumping too much threatens thousands of underground species”, https://www.downtoearth.org.in/environment/we-rely-heavily-on-groundwater-but-pumping-too-much-threatens-thousands-of-underground-species-93392

At present, the species in our groundwater are worryingly overlooked by environmental protection laws, both in Australia and worldwide. This hidden water is hard to access, and many of us simply don’t know about the life in groundwater — and the life it enables.

To fix it, we can move towards approaches which actively consider the ecological role of groundwater in the global water cycle — and which protect it.

Water, after all, is the basis of life on Earth. If we ignore the ecological integrity of the largest freshwater resource on Earth, we threaten the sustainability of entire ecosystems — and our own societies.

#### Passive safety either doesn’t work or makes failures worse, regulators will water down precautions, and SMRs make sabotage easier---the combined effect greatly increases the risk of accidents.

Dr. Ed Lyman 24, PhD from Cornell, Director of Nuclear Power Safety with the Union of Concerned Scientists, internationally recognized expert on nuclear proliferation and nuclear terrorism as well as nuclear power safety and security, member of the Institute of Nuclear Materials Management, and has testified numerous times before Congress and the Nuclear Regulatory Commission, “Five Things the “Nuclear Bros” Don’t Want You to Know About Small Modular Reactors”, https://blog.ucsusa.org/edwin-lyman/five-things-the-nuclear-bros-dont-want-you-to-know-about-small-modular-reactors/

However, the so-called passive safety features that SMR proponents like to cite may not always work, especially during extreme events such as large earthquakes, major flooding, or wildfires that can degrade the environmental conditions under which they are designed to operate. And in some cases, passive features can actually make accidents worse: for example, the NRC’s review of the NuScale design revealed that passive emergency systems could deplete cooling water of boron, which is needed to keep the reactor safely shut down after an accident.

In any event, regulators are loosening safety and security requirements for SMRs in ways which could cancel out any safety benefits from passive features. For example, the NRC has approved rules and procedures in recent years that provide regulatory pathways for exempting new reactors, including SMRs, from many of the protective measures that it requires for operating plants, such as a physical containment structure, an offsite emergency evacuation plan, and an exclusion zone that separates the plant from densely populated areas. It is also considering further changes that could allow SMRs to reduce the numbers of armed security personnel to protect them from terrorist attacks and highly trained operators to run them. Reducing security at SMRs is particularly worrisome, because even the safest reactors could effectively become dangerous radiological weapons if they are sabotaged by skilled attackers. Even passive safety mechanisms could be deliberately disabled.

Considering the cumulative impact of all these changes, SMRs could be as—or even more— dangerous than large reactors. For example, if a containment structure at a large reactor reliably prevented 90% of the radioactive material from being released from the core of the reactor during a meltdown, then a reactor 5 times smaller without such a containment structure could conceivably release more radioactive material into the environment, even though the total amount of material in the core would be smaller. And if the SMR were located closer to populated areas with no offsite emergency planning, more people could be exposed to dangerously high levels of radiation.

### Accidents---Link---AT: Inevitable

#### Nuclear’s not inevitable---renewables are. Global nuclear trends are down.

Dr. Carole Nakhle 24, PhD in Energy Economics from the University of Surrey, Energy Research Fellow at the Surrey Energy Economics Centre, University of Surrey and also acts as Special Parliamentary Adviser on Energy and Middle Eastern Issues in the House of Lords, “Nuclear energy: Not much reaction”, https://www.gisreportsonline.com/r/nuclear-energy-outlook/

Nuclear power remains underutilized despite its reliability and scale, struggling to regain market momentum amid growing calls for less reliable renewables.

Nuclear power offers several undeniable advantages over renewable energy, particularly regarding the scale and reliability of electricity generation. This resilience makes the need for backup generation unnecessary even when the sun is not shining or the wind is not blowing. Yet zero-emission nuclear power receives scant attention in the ongoing debate about the energy transition.

The European Union, the region most aggressively pursuing ambitious climate targets, hesitantly acknowledged nuclear energy in its 2022 “sustainable investment taxonomy.” This designation is intended for projects that will aid the transition from fossil fuels and ensure Europe achieves climate neutrality by 2050. The taxonomy ranks nuclear alongside natural gas – a hydrocarbon – describing both as “transitional activities” aimed at facilitating a shift away from more harmful energy sources like coal and toward a predominantly renewable future, although with “strict conditions” applying. Such a limited acknowledgment is unlikely to stimulate significant investment in nuclear power.

Despite the advent of nuclear energy nearly 70 years ago – when the first nuclear plant began operating in Obninsk, Russia – it currently accounts for the lowest share, a mere 4 percent, of the global primary energy mix, and represents only 9 percent of electricity generation. Even at its peak in 2001, nuclear energy represented less than 7 percent of the global energy framework. In contrast, the share of modern renewable energies surged from 1 to 8 percent between 2001 and 2023.

Nuclear power generation, which peaked at nearly 17.5 percent of the power sector’s global total in 1995, has followed a declining trend similar to that of oil. Conversely, natural gas and renewables like wind and solar have made substantial gains, rising from 15 percent and 20 percent, respectively, in 1995, to 23 percent and 31 percent, respectively, by 2023.

While a shift in energy sources is occurring, it appears the world is mainly replacing one fossil fuel with another and one green energy source for another. This is not indicative of a successful energy transition; on the contrary, the target outcome seeks to replace fossil fuels with truly sustainable and emissions-free energy options.

Nuclear trends

On a regional scale, trends diverge. While some corners of the globe have embraced nuclear power, others have abandoned it. Until 2016, Europe was the dominant player in the nuclear energy market, generating 36 percent of global nuclear power. Today, however, Europe ranks third, holding a 27 percent share, following North America at 34 percent and the Asia-Pacific region at 29 percent. In Africa, Latin America and the Middle East, nuclear energy usage is minimal, accounting for an aggregate share of just 2.5 percent.

But nuclear energy has recently witnessed a resurgence in support. In late 2023, for the first time at a Conference of Parties (COP, the highest-level decision-making body of the signatories of the 1992 United Nations Framework Convention on Climate Change), around 25 countries, including several European states, backed the Declaration to Triple Nuclear Energy capacity by 2050.

At the same time, the broader consensus takeaway from the meeting, known as the Global Stocktake, called for accelerated deployment of nuclear energy, prompting the International Atomic Energy Agency to describe these events as “nothing short of a historic milestone and a reflection of how much perspectives have changed.” Nevertheless, this renewed interest in nuclear energy remains dwarfed by the extensive financial support consistently enjoyed by renewable energy, which is regarded as the safer, more accessible alternative.

The debate surrounding nuclear energy is set to continue, with regional disparities persisting. Countries pursuing nuclear electricity generation will advance at markedly different rates, with several projects stalling in the planning phase. Overall, as the energy transition unfolds, nuclear power will likely remain a laggard despite its reliability and “green” potential.