# NDCA – Politics Neg v1

## Stablecoin Version

### Contention 1 – Politics

#### Stablecoin will pass now. Negotiations are ongoing.

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The U.S. Congress' opening priority for the crypto industry is to quickly finish a stablecoin oversight bill, and the House of Representatives has released the text of its version on Wednesday, following in the heels of a recent committee approval of its Senate counterpart. The House version, introduced by Rep. Bryan Steil, who leads the House Financial Services Committee's crypto panel, and Rep. French Hill, the Republican chair of the overall committee, governs the way companies can issue dollar-denominated digital tokens. The new version will "close the gap" between the House efforts and the Senate version of the bill, Steil said during a conference appearance Wednesday. The Stablecoin Transparency and Accountability for a Better Ledger Economy (STABLE Act) "is a strong continuation of our work on digital assets in the last Congress," Hill said in a statement. The Senate Banking Committee had already advanced its own version of the legislation with a strong bipartisan vote, so it moves on now to consideration on the Senate floor. Rep. Tom Emmer, the House majority whip who has been among Congress' top crypto advocates for years, said the two bills have "some minor differences that I'm sure can be ironed out."

#### Clean energy policy breaks GOP unity by pitting archconservatives against climate moderates

Dumain 25, covers Congress for E&E News, Capitol Hill reporter since 2010, most recently a congressional correspondent for McClatchy (Emma, “How will Mike Johnson lead Republicans on climate? The embattled speaker will have to help settle deep divisions on energy policy and climate action. It’s unclear whether he’s up to the task.,” *E and E News*, https://www.eenews.net/articles/how-will-mike-johnson-lead-republicans-on-climate-2/)

House Republicans who want their party to engage on climate policy will likely continue to be led over the next two years by a lawmaker who has been largely silent on the issue. Since winning the gavel in October 2023, Speaker Mike Johnson (R-La.) has done little to shed light on whether he believes human activity is contributing to the climate crisis — even as more of his members are joining caucuses designed to stop the planet from warming. His failure so far to weigh in on the matter in a meaningful way raises questions about whether House Republican leaders will take climate members’ concerns seriously in the 119th Congress — especially with Johnson under pressure from both archconservatives as he also attends to moderates making up his narrow majority. “I’d like to hear what he has to say about it,” said Rep. Buddy Carter (R-Ga.), a senior member of the House Energy and Commerce Committee, regarding the speaker’s climate views. Carter, a vice chair of the House Conservative Climate Caucus, was among the nearly two dozen House Republicans surveyed by POLITICO’s E&E News in recent months about whether Johnson believes in the scientific conclusions surrounding climate change. None of them could say for sure where Johnson ~~stood~~ (fell) on the matter, making it hard to anticipate how the speaker will help settle internal divisions on climate and energy — especially when House Majority Leader Steve Scalise, a fellow Louisianan, is vocally skeptical that humans are having a role in warming the planet. Rep. Doug LaMalfa (R-Calif.), the incoming chair of the Congressional Western Caucus, which typically supports expanded fossil fuel development, said he hadn’t spoken to Johnson about the issue but suspected the speaker is “not interested in doing a whole lot of climate games” and doubted that “it’s a big thing on his agenda.”

#### GOP disunity breaks the whole agenda

Arnold and Chakrabati 1-20-2025, both hosts at On Point Podcast (“The Republican Congress' 2025 agenda,” On Point Podcast, https://www.wbur.org/onpoint/2025/01/20/republican-congress-2025-agenda)

CHAKRABARTI: Well, just quickly, Robert, I'm going to bring another guest in here, but is Speaker Johnson still right in his confidence there? I mean, I was getting a sense that Representative Turner was very unhappy. JIMISON: Speaker Johnson hopes he's right. And what he's saying there is a glimpse into the window of the wheeling and dealing on Capitol Hill. Congress and especially the job of the speaker is just constantly, you know, making deals, trying to make one group happy, trying to make another group happy, trying to keep people from being unhappy, even if you're not able to give them everything they want, so that when those pivotal moments come where you do need to rely on your caucus to come together, you hope it works. And so we'll find out along with Speaker Johnson if, you know, the kind words that he's been saying about Congressman Turner really do pan out. But, you know, it's not just Congressman Turner. There are so many people in his entire conference who have, you know, small grudges that can turn into larger issues. And like we saw during the last Congress, with the slim majority, any one member pretty much has the ability to just slam on the brakes for the Republican agenda.

#### Stablecoin legislation solves financial instability

Dudley 3-24-2025, an American economist who served as the president of Federal Reserve Bank of New York from 2009 to 2018 (Bill, “The US Needs Stablecoin Legislation Now,” *Project Syndicate*, https://www.project-syndicate.org/commentary/us-stablecoin-legislation-following-trump-executive-order-by-bill-dudley-2025-03)

Without a robust regulatory framework that incentivizes stablecoin issuers to register in the United States, stablecoin activity will migrate to countries with weaker rules, increasing the likelihood of financial instability. Fortunately, the US can still head off these risks and reap the technology’s benefits. The global financial system is on the brink of a transformation. As a recent Bretton Woods Committee paper points out, stablecoins – digital assets usually backed by a fiat currency, commodity, or another cryptocurrency to minimize volatility – have the potential to make payments and money transfers faster, cheaper, and more transparent, while also expanding financial inclusion. That is why many jurisdictions, including the European Union and Japan, have already sought to seize the opportunity by providing regulatory clarity for the industry. But it is the United States that is ultimately best positioned to lead, given that the $200 billion in stablecoins circulating today are predominantly denominated in dollars. We have already seen early signs of what the US approach might look like. In late January 2025, President Donald Trump issued an executive order directing federal agencies to “promote the development and growth of lawful and legitimate dollar-backed stablecoins worldwide.” His AI and crypto czar, David Sacks, then gave a press conference to showcase a bipartisan roadmap for digital-asset legislation. Recent bipartisan legislative activity does indeed show that Congress understands the stakes. The Guiding and Establishing National Innovation for US Stablecoins (GENIUS) Act, introduced by Senators Bill Hagerty, Tim Scott, Kirsten Gillibrand, and Cynthia Lummis, would establish a federal framework for larger stablecoin issuers, while preserving state-level regulatory authority for smaller ones. Meanwhile, the House Financial Services Committee is considering the Stablecoin Transparency and Accountability for a Better Ledger Economy (STABLE) Act, which similarly aims to bring oversight and greater transparency to the market. The committee has also released a discussion draft that was previously negotiated between its Republican former chair, Patrick McHenry, and the ranking Democratic member, Maxine Waters. Congressional action could not be more urgent. Promoting more economic activity on digital ledgers (blockchains) could have profound implications for the efficiency and inclusiveness of the financial system, ultimately bolstering people’s standard of living. For decades, the global financial system has struggled with outdated infrastructure that makes payments slow, expensive, and inefficient. Traditional remittances, for example, take days to settle and still cost an average of 6.62% of the amount sent. Stablecoins can offer a superior alternative: nearly instantaneous transfers that settle directly, with negligible costs. Nor do the benefits stop there. Stablecoins have already become vital financial tools in emerging markets, where local currencies are often volatile. Around the world, companies are considering how the technology might streamline corporate treasury management (by reducing reliance on costly correspondent banking networks) and fulfill key functions in traditional capital markets (from serving as collateral to expediting settlement). As the world moves toward a tokenized financial future where transactions settle in seconds, costs are minimized, and access to the global economy is broadened, stablecoins can play a pivotal role. Importantly, the recent US legislative proposals seek to address the risks that can arise with novel forms of finance. Chief among these are instability and a lack of trust. Strong reserve requirements and banking connectivity are needed to ensure that stablecoins can always be redeemed at par. Moreover, high levels of transparency and attention to operational resiliency are essential to maintain confidence even when the financial system is buffeted by financial and economic shocks. And to address concerns that stablecoins could be used to finance illicit activities, there must be strong guardrails to ensure universal adherence to the Financial Action Task Force’s AML/CFT (anti-money laundering/countering the financing of terrorism) standards. The consequences of inaction are obvious. Without a robust regulatory framework that incentivizes stablecoin issuers to register and build their businesses in the US, stablecoin activity will migrate to countries with less robust rules, reducing US oversight and increasing the risk of financial instability. Inaction could also jeopardize the dollar’s dominance if non-dollar stablecoins gain traction in global trade and finance. US leadership on regulation of stablecoins is a way of ensuring both stability and strength for the dollar. America’s allies and adversaries are racing to establish new payment regimes that would set the standard for the rest of the world. Congress and the Trump administration should move swiftly to provide a foundation for the US private sector to lead in these vital technologies – and to do so in a way that ensures stability and trust, and that is aligned with US national and economic security interests. Digital assets promise a comprehensive upgrade of our twentieth-century financial systems. Integrating stablecoins into traditional financial markets can unleash the next wave of payment innovation. The Trump administration and the current Congress seem to understand that the digital transformation of money and finance is inevitable. Now they must take charge of shaping the future of stablecoins and ensuring their safety, lest the benefits be ceded to others.

#### Financial crises lead to war

Lawrence 24, Lawrence, Research Fellow at the Cascade Institute at Royal Roads University, PhD Global Governance, University of Waterloo; Thomas Homer-Dixon, Executive Director at the Cascade Institute; Scott Janzwood, Research Director at Cascade Institute, PhD Global Governance, University of Waterloo; Johan Rockstöm, CEO of Exalt Network AB, BA Financial Economics, Lund University; Ortwin Renn, Prof. of Risk Governance at the University of Stuttgart, former Scientific Director at the Institute for Advanced Sustainability Studies; and Jonathn Donges, Post-Doctoral Researcher at the Potsdam Institute for Climate Impact Research (Michael, et al, “Global polycrisis: the causal mechanisms of crisis entanglement,” Global Sustainability, 7(e6), 1-17-2024, DOI 10.1017/sus.2024.1)

In Figure 9a, economic turmoil arising, for instance, from inflation, financial crisis, and debt – or perhaps due to scarcities of key resources such as energy, food, water, and raw materials – creates mass grievances and institutional opportunities for populist leaders to capture political power and weaken the rule of law. These leaders' actions to establish authoritarian regimes simultaneously draw on and amplify nationalist, chauvinistic, and anti-globalization ideologies, often by scapegoating foreigners, cosmopolitan elites, and internal minorities. Although their efforts to decouple the national economy from the world economy generally worsen internal economic turmoil, this turmoil, paradoxically, often exacerbates the grievances and opportunities the leaders can exploit to consolidate their power (by blaming ‘foreign elements’ or ‘internal enemies’ for the economic crisis). In the last decade, this feedback has operated in such diverse countries as Venezuela, Nicaragua, Russia, Turkey, Zimbabwe, Myanmar, and Sri Lanka. In Figure 9b, we show that populist authoritarian regimes espousing nationalist and anti-globalization ideologies generally decrease their participation in international institutions, reduce their international cooperation, and focus their attention and resources inward. They thus diminish opportunities for mutually beneficial economic exchange and forego the benefits of globalization, which can worsen both internal and global economic turmoil. In Figure 9c, we indicate that, in the decades ahead, less international cooperation will perhaps fatally weaken international action to slow climate change. More frequent and severe extreme weather events will then trigger flows of migrants toward richer countries (Lustgarten, Reference Lustgarten2020; Xu et al., Reference Xu, Kohler, Lenton, Svenning and Scheffer2020), an influx that is likely to increase support for chauvinistic and isolationist ideologies in receiving societies. The resulting exacerbation of economic turmoil could ultimately propel out-migration from these countries. Finally, Figure 9d shows that the chauvinistic reaction to mass migration is likely to precipitate violence against those seeking refuge and those deemed too sympathetic toward outsiders. Meanwhile, extreme weather events could worsen intercommunal tensions, trigger state collapse and civil war, and increase the probability of international conflicts over scarce resources, including water and food. Civil violence and interstate war tend to deepen nationalism while generating new waves of refugees and exacerbating economic turmoil. These pernicious feedbacks are certainly not inevitable; but if they were to take hold they would escalate all of the problems depicted in Figure 9 in a catastrophic spiral.

### Contention 2 - Biodiversity

#### Even a limited expansion of nuclear power *destroys the biosphere*.

Dr. M.V. Ramana 24, PhD in Physics from Boston University, Professor and Simons Chair in Disarmament, Global and Human Security at the University of British Columbia, and Director of the Master of Public Policy and Global Affairs program at the School of Public Policy and Global Affairs, previously worked at the Nuclear Futures Laboratory and the Program on Science and Global Security, both at Princeton University, member of the International Panel on Fissile Materials, the International Nuclear Risk Assessment Group, and the team that produces the annual World Nuclear Industry Status Report, “Nuclear is not the solution: atomic power in the age of climate change”, Verso Books

My bottom line is that nuclear energy, whether with old reactor designs or new faux alternatives, will simply not resolve the climate crisis. The threat from climate change is urgent. The world has neither the financial resources nor the luxury of time to expand nuclear power. Meanwhile, even a limited expansion would aggravate a range of environmental and ecological risks. Further, nuclear energy is deeply imbricated in creating the conditions for nuclear annihilation. Expanding nuclear power would leave us in the worst of both worlds. Too virtuous to meter? Proponents of nuclear energy have other reasons to support their preferred technology. They argue that nuclear reactors can do much more than just generate electricity. The “much more” depends on the specific context, and could include creating well-paying jobs, boosting national pride, providing energy independence, supplying clean water, and producing medical isotopes to treat cancer. As the public has become more concerned about climate change, nuclear advocates have appended to this list two more applications for energy from nuclear reactors: capturing carbon dioxide from the atmosphere (direct air capture) and producing hydrogen and high temperature heat for industrial processes. All of these are reminiscent of what Admiral Lewis Strauss, one of the central characters in the hit Hollywood film Oppenheimer and the chair of the US Atomic Energy Commission in the 1950s, told the National Association of Science Writers on September 16, 1954. Ten days after the ground-breaking for first US nuclear plant, Strauss told his audience that given the great promise of nuclear technology, it would not be “too much to expect that our children will enjoy in their homes electrical energy too cheap to meter.” The many claims about what else nuclear reactors can do make one wonder: Is nuclear energy too virtuous to meter? Let me offer one example from a company called Hyperion Power Generation offering a small nuclear power plant design that was actively covered in the media between 2007 and 2012. In March 2010, the founder of this company, John Deal, told the Albuquerque Journal, “We started this company to clean water in Africa … Our emphasis is helping people not die from not having clean water … If you’ve got energy, you can have all the clean water you want.” This was not a one-off sales pitch. In their 2011 article in Issues in Science and Technology, writer Ross Carper and academic Sonja Schmid offer this description of Deal in action: In the middle of Deal’s talk in Denver, he began flipping through some artist-drawn images. The most striking of all shows a small nuclear reactor, buried and unattended at what looked to be less than 15 feet below the surface. Two simple tubes snake upward from the reactor, drawing the eye to a pair of gray above-ground tanks, with the words “Potable Water” stamped on the side. The setting? An impoverished African village complete with about a dozen mud constructed, thatch-roofed huts. A handful of people were drawn into the image, all of them walking to or from the clean water source, which is apparently powered by a $50 million HPM.7 HPM stands for Hyperion Power Module, the nuclear reactor the company was advertising, and the cost estimate of $50 million for a nuclear reactor should be seen in that light—as wishfully cheap. (A few years later, Pitch Book, a database of private equity-based corporations, listed the company as “out of business.”) Such promises of atomic energy delivering progress to Africa date back to the beginning of the nuclear age. On January 28, 1947, for example, Waldemar Kaempffert, the science editor of the New York Times, predicted, The desert of Sahara could easily be irrigated by electric pumps driven by uranium power, with the result that more surplus cotton than we could sell at a profit and more surplus plant food than we could eat would be dumped on the market. Africa would be transformed into another Europe, with savages [sic!] who never saw a steam shovel or railway train transformed into machine tenders.8 After more than half a century of experience with nuclear technology, ideas about using it to provide clean water to poor people are delusional at worst and deceptively self-serving at best. Reducing the problem of insufficient clean water to an absence of energy ignores the many other problems that prevent African villagers from accessing clean water and the persisting legacies of colonialism and imperialism that led to “underdevelopment” in the first place.9 In his “communal memoir” of the aerospace industry Blue Sky Dream, the journalist David Beers talks about a special characteristic of the former Nazi rocket scientist Wernher von Braun, the man sometimes termed “the father of America’s space program” due to his important role in transferring rocket technology to the United States. The classic American entrepreneurial hero searches out unmet desires in the everyday world and then, with a certain flexible flair, invents the answers, products for the masses to use. Von Braun’s genius lay elsewhere. He was brilliant at inventing new and different uses for the only product he ever desired to make, the space rocket. He was a master at selling his one product to the only customers who could ever afford it, a nation’s rulers.10 Much like von Braun, vendors and advocates of nuclear power are really interested only in selling nuclear reactors, and they try to invent different uses for their favoured product. Delivering clean water, heating houses or industries, and propelling rockets and ships are all only vehicles for selling nuclear reactors. However, the appeal to other uses for nuclear reactors is also, simultaneously, an expression of the inability of the technology to economically deliver on its primary product: electricity. It is the weakness of the nuclear industry that forces it to seek alliances with other constituencies. Too destructive to meter? Nuclear energy does have one virtue, but it is one that its advocates, for the most part, avoid mentioning: its innate and inseparable connection to nuclear weapons, and more generally, to the military. I use the word “virtue” to mean both an inherent attribute and an asset beneficial to its proponents. Technically, there are significant overlaps between the apparatus needed to produce nuclear energy and what is needed to produce the fissile material, the hardest step in acquiring nuclear weapons. In addition, personnel can be interchanged between the nuclear energy and weapons programs. And finally, there are institutional incentives for organizations developing nuclear energy to get involved in making nuclear weapons, due to the political power that flows from the latter. Nuclear technology also contributes to powering long-range submarines, especially those used to fire off nuclear missiles, and to providing the material to manufacture depleted uranium munitions used in Iraq and Ukraine. I elaborate on these connections in chapter 5. Nuclear energy advocates often argue against conflating nuclear energy with nuclear weapons, but the connection is visible for all those who want to look. As of September 2023, 275 of the 410 nuclear reactors labelled as operating by the International Atomic Energy Agency are in countries possessing nuclear weapons. Add countries like Canada and Japan that are militarily allied with nuclear weapon states, and the overlap is staggering. While it is certainly true that not all countries with nuclear energy have produced nuclear weapons, they are closer to being able to do so than they would be if they had never built nuclear reactors. The overlap between the two technologies was obvious to most knowledgeable people at the beginning of the atomic age. In 1946, when discussing a proposal for the international control of nuclear weapons, Robert Oppenheimer, the head of the program that produced the first atomic bombs, which destroyed Hiroshima and Nagasaki, expressed it thus: “We know very well what we would do if we signed such a convention: we would not make atomic weapons, at least not to start with, but we would build enormous plants, and we would design these plants in such a way that they could be converted with the maximum ease and the minimum time delay to the production of atomic weapons.” Within a few years, however, countries with nuclear technology started a sustained campaign to get the public to think differently about nuclear energy, most notably after President Dwight Eisenhower’s “Atoms for Peace” speech in 1953. This “greatest of destructive forces,” Eisenhower prophesized, “can be developed into a great boon, for the benefit of all mankind,” can be put to “universal, efficient and economic usage” and whose “special purpose would be to provide abundant electrical energy in the power-starved areas of the world.” In other words, forget the destructive capacity of nuclear energy. Just focus on what a wondrous future it can create. The Soviet counterpart of this effort is captured by the slogan “May the atom be a worker, not a soldier.” The hope seems to be that by pretending that nuclear energy was not linked to weapons, public fears about the destruction that would result from the use of nuclear weapons would be quelled. Institutions and governments around the world developing nuclear technology often start by touting its potential to produce electricity. This was the case in India. For over two decades, India’s Atomic Energy Commission was ostensibly working on nuclear energy only “for peaceful purposes,” until the 1974 test of a nuclear weapon blew up that pretense.11 Many private companies profit enormously from both nuclear energy and nuclear weapons. Examples include Bechtel, Babcock & Wilcox (now BWX Technologies), and Fluor in the United States, Larsen & Toubro in India, and Rolls Royce in the United Kingdom. While there might not be a similar level of involvement by private companies in countries like China, where public sector and national organizations play the analogous roles, the differences between the two categories are not very material to understanding the structure of, and trends in, the nuclear sector. National laboratories contract out work and are sometimes even managed by private companies. And private companies thrive on public contracts that they often have exclusive access to, belying any notion of free markets and competitive entrepreneurship. For both corporate and governmental entities, nuclear technology is a wonderful asset. As analyst and disarmament activist Andrew Lichterman argues: The nuclear road provides elites in nuclear establishments with privileged access to their own country’s resources, a development context that can be shielded from foreign competition, and forms of trade and industry that can be portrayed as increasing in importance as fossil fuels diminish. This is so whether the intention to develop nuclear weapons is clear or is allowed to remain ambiguous. The powerful tools of nationalism and ‘national security’ secrecy can be used to facilitate the extraction of wealth from the rest of society and prevent scrutiny of national nuclear enterprises that whether in first generation nuclear powers or post-colonial states have been rife with technical problems, corruption, and widespread, intractable environmental impacts.12 Overview of the book The chapters that follow explain why expanding nuclear power production is neither a desirable nor a feasible solution to climate change. Due to the use and production of radioactive materials at reactors, expanding nuclear energy to mitigate climate change will inevitably result in a variety of undesirable risks and environmental impacts. Nor is it compatible with environmental and social justice.13 The consequences and burdens of such an expansion will fall primarily on communities that are distant from the centers of power, and economically and politically too marginal to figure in the calculations of decision makers. In chapter 1, I explain how all nuclear reactors, including small ones, are at risk for severe accidents due to their intrinsic technological characteristics. When it comes to nuclear facilities, I will argue, there is nothing that fits a strict definition of “safe.” The risk is exacerbated by a range of factors, including extreme weather patterns due to climate change, the multiple and conflicting priorities of organizations operating nuclear facilities, and the weakening of regulation by industry lobbyists and other powerful economic actors. Accidents, when they occur, produce radioactive contamination that reaches across space and time; thirty-five years after the Chernobyl accident, parts of Ukraine and Belarus are still uninhabitable because of high radiation levels. Radioactive cesium released by the disaster was found in sheep in England, which remained contaminated for decades; restrictions on eating these sheep were lifted in all areas only in 2012. Expanding nuclear energy production will also result in a growing inventory of radioactive wastes, no matter what kinds of reactors are used. Some of these wastes remain radioactive, and thus hazardous to human health, for hundreds of thousands of years. Despite decades of well-funded research, there is no demonstrated way to safely manage them, and because of the long periods involved, there will always be uncertainties about the fate of these materials.14 As a result, it is likely that radioactive materials will contaminate the biosphere at some point in the future. This is an important cause for opposition from communities near sites chosen for nuclear waste repositories. Another concomitant activity to the operation of reactors is uranium mining, which has been responsible for contaminating land and water around the world, especially in areas occupied by Indigenous communities. Given these inevitable impacts, nuclear power is neither clean nor sustainable. One way that some nuclear energy advocates try to get around these conclusions is by claiming that exposure to radiation is harmless, at least below some threshold. But as I explain, there is ample evidence that exposure to radiation, even at low levels, leads to cancers and other negative health outcomes.

#### Biodiversity loss causes extinction.

Dr. Justine Bell-James 25, Professor & Director of Higher Degree Research at the TC Beirne School of Law at the University of Queensland, PhD from QUT (2010) and was a postdoctoral research fellow at UQ's Global Change Institute from 2011-2013, has led projects funded by the Australian Research Council, CSIRO, and the National Environmental Science Program, also with James Watson, “With just 5 years to go, the world is failing on a vital deal to halt biodiversity loss”, https://theconversation.com/with-just-5-years-to-go-the-world-is-failing-on-a-vital-deal-to-halt-biodiversity-loss-249841

As biodiversity continues to degrade, the foundation of life on Earth becomes increasingly unstable. Biodiversity loss threatens our food, water and air. It increases our vulnerability to natural disasters and imperils ecosystems crucial for human survival and wellbeing.

### Contention 3 – Grid Resilience

#### Momentum for decentralized renewable power is strong now---that’s vital to grid resilience. Collapse causes cascading blackouts.

Habeeb Shittu 25, Electrical Engineer II at Moffatt & Nichol, has a robust background in Electrical Power System Design and Substation Engineering, coupled with expertise in SCADA (Supervisory Control and Data Acquisition) Systems engineering, current Graduate Teaching Assistant North Carolina Agricultural and Technical State University, “Microgrids as a Solution for Disaster Resilience and Cybersecurity – Decentralized Energy Systems Reducing Grid Vulnerabilities”, https://energycentral.com/c/gr/microgrids-solution-disaster-resilience-and-cybersecurity-%E2%80%93-decentralized-energy

Today, the grid is in great jeopardy from both environmental catastrophes and cyber warfare. The excessive dependence on centralized power grids results in extended power outages and increased cyber security vulnerabilities in times of hurricanes, wildfires, floods and cyberattacks. Microgrid technology has emerged to provide a pathway to disaster resilience while decentralizing the energy system and boosting cybersecurity. Small electric power systems called microgrids act alone as standalone power units which produce and send electricity independently. An independent operational capability exists within microgrids combined with their ability to link with central power systems in emergency situations. Microgrids minimize fossil fuel demands through solar and wind-based renewable power generation with battery systems which ensure continuous electricity supply under adverse conditions. Microgrids also help electric vehicle charging stations and support smart grids (systems and technology that improves energy use at peak times and responds in a timely manner to energy needs). Leverage auxiliary networks for disaster relief. Microgrid systems were instrumental in powering up devastated communities in Puerto Rico after the island was hit by Hurricane Maria showing how effective they can be when dealing with disaster recovery. Likewise, during the Texas winter storm of 2021, widespread blackouts highlighted the urgency of local energy solutions. Microgrid installations spread across Texas in the years that followed and have offered reliable power and less reliance on an aging main grid. Projects of hospitals together with water treatment facilities and critical infrastructure benefit from microgrids which allow them to function during larger system outages. These systems deployed at military bases enhance protection of vital mission operations by shutting out both digital and physical safety threats. The vulnerability of national energy systems relies heavily on cybersecurity because attackers seek to attack traditional networked energy systems. The integration of microgrids as multiple interconnected smaller systems for distributing power is already established throughout various American cities. The integration of blockchain and AI-driven threat detection technologies into microgrids improves their overall cybersecurity. The security system becomes stronger through communication encryption alongside real-time intrusion detection improvements and lower cyber tampering risks. Widespread outages occurred in Ukraine because hackers targeted its power grid during 2015 and 2016. Such attacks would have caused smaller impacts because widespread implementation of microgrids would have occurred. During a cyberattack, microgrids can isolate compromised areas, preventing cascading failures that lead to large-scale blackouts. AI-powered monitoring systems provide real-time analysis, allowing operators to detect and mitigate threats efficiently. Blockchain technology enhances security by creating immutable energy transaction records, reducing exposure to cyber fraud. By decentralizing the power supply, microgrids introduce redundancy and resilience, making energy networks far less susceptible to widespread failures. The deployment of microgrids has proven beneficial across various applications. In California, microgrids have been installed in wildfire-prone areas to maintain power during transmission line shutdowns. Remote rural regions worldwide have adopted microgrids to ensure electricity access where extending the main grid is neither feasible nor cost-effective. Humanitarian aid organizations, including the United Nations and the Red Cross, have explored microgrid-powered camps to provide emergency electricity in disaster-stricken and refugee areas. Additionally, microgrids are increasingly used in the healthcare sector, ensuring critical facilities remain operational during crises. Recognizing these benefits, governments are investing in microgrid projects to strengthen infrastructure resilience and accelerate technological adoption. Despite their advantages, microgrids face challenges related to cost efficiency, regulatory barriers, and integration with existing power systems. While initial deployment costs can be significant, long-term energy savings and improved reliability justify the investment. However, many regions lack clear policies to support widespread microgrid adoption, necessitating regulatory frameworks that facilitate seamless integration. Continued advancements in power transmission technology are essential for microgrids to function effectively alongside traditional grids. Collaboration between the public and private sectors is necessary to establish standardized guidelines, ensuring efficient implementation across industries and communities. Governments can encourage microgrid adoption through subsidies and incentives. Countries like Japan and Germany have already implemented financial programs to support microgrid installations, ensuring a transition to more resilient energy networks. Urban projects such as the Brooklyn Microgrid in New York City demonstrate the feasibility of decentralized energy solutions. The Brooklyn Microgrid allows peer-to-peer energy trading, enabling residents to sell excess solar power within their community, reducing reliance on centralized utilities while promoting renewable energy use. Similar microgrid projects in African nations have provided electricity to remote villages, fostering economic growth and improving quality of life. As the global energy landscape shifts, microgrids represent a fundamental step toward a more secure and resilient power infrastructure. By decentralizing energy generation and incorporating state-of-the-art cybersecurity protections, microgrids are becoming a key component of modern energy strategies. Investing in microgrid technology enables governments and private enterprises to safeguard critical infrastructure against natural and cyber threats, ensuring a sustainable and secure energy future. Through continued innovation, supportive policies, and strategic investments, microgrids will play a pivotal role in building a stronger and more adaptable energy ecosystem for future generations. Given rising climate uncertainties and escalating cyber threats, microgrids stand as a crucial safeguard, ensuring communities, industries, and essential services remain resilient and operational in any crisis scenario.

#### Scaling up nuclear energy *crowds out* decentralized renewables.

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The crowding out hypothesis Our final hypothesis, the crowding out hypothesis, is that the relative scale of nuclear attachments will tend to associate negatively with renewables attachments, and vice versa. In simpler terms, the two options show a tendency to mutual exclusion, and each creates lock-ins or path dependencies that crowds out the other. There exists no shortage of candidates for the kinds of mutual incompatibility, reciprocal tension and active antagonism that might (in one direction or another) serve to drive this crowding out. Take the configuration of electricity transmission and distribution systems, for instance. It is well recognized that a grid structure optimized for larger-scale centralized power production (like much conventional nuclear power) will tend on balance to make it more difficult, time-consuming and costly to introduce small-scale distributed power (like many renewables). The same is true of the associated norms, protocols, contracts, and operating codes and expert cultures necessary to make these structures work 20. Likewise, although the limited relevant history of existing electricity systems around the world makes this more uncertain, it is probably the case on each of these points that the reverse may also be true (that is, that optimization around renewables would impede nuclear). In broadly comparable ways, finance markets, regulatory institutions and employment practices structured around large-scale, base-load, long-lead-time construction projects for centralized thermal generating plants will not handle so well a multiplicity of much smaller, short-term, distributed initiatives, and vice versa. The particular necessity with nuclear power of elaborate governance arrangements around potentially catastrophic safety risks, security against attack, long-run waste management and safeguarding against proliferation also tends to sideline resources and attention from other options 21. On the other hand, the erosion by renewables of the funding base for these expensive arrangements will tend to raise the unit costs falling on nuclear power. Finally, whatever the detail may be of particular interdependencies, the undoubted military connections and security repercussions displayed by nuclear power but not renewables mean (depending on context) that each will tend to be favoured under contrasting political circumstances and perspectives, thus introducing another mutual tension 22. Indeed, there is a wider sense in which nuclear power and renewables each reflect ‘technological aesthetics’ that are valued by contrasting socio-political communities, such that whatever the operational merits may be judged to be, either will incur the antagonism of the constituency associated with the other.

#### Grid collapse ends civilization.

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Strip away the digital veneer of our modern civilization — the smartphones, the streaming services, the smart home symphony — and you’re left with two fundamental pillars of survival: water and power. We take them for granted until the taps run dry and the lights flicker out. While food and shelter form the foundation of survival, they’re supported by the invisible architecture of modern existence — power grids and water systems. Think of it this way: our ancestors could hunt or gather food, and shelter was a matter of finding the right cave or building materials. But try gathering megawatts or harvesting municipal water pressure through sheer willpower and determination. That’s why I’m focusing in on these twin pillars of modern survival: not because food and shelter matter less, but because when power and water fail, even the best-stocked shelter can become an uncomfortably warm cave with expensive canned decorations. I want you to be better prepared. The Probability of Darkness The fragility of our power and water infrastructure isn’t just theoretical — it’s a ticking probability bomb with multiple detonators. From natural disasters to cyber attacks, from solar flares to physical sabotage, the ways our critical systems can fail are multiplying faster than our defenses evolve. Climate change has transformed “once-in-a-century” events into seasonal visitors, while the U.S. Department of Energy tallies over 200 significant cyber attacks targeting energy infrastructure annually. “The question isn’t if you’ll face a resource crisis — it’s which one will arrive first, and how prepared you’ll be when it does.” Then there’s the cosmic joker in the deck: solar flares. A Carrington Event-level solar storm — like the one that hit Earth in 1859 — would today cascade through our power grids like digital wildfire. NASA’s estimate of a 12% probability for such an event within the next decade should give us pause. It’s not comfortable odds when the stakes include continent-wide blackouts. Although, I would consider serious state-sponsored cyber attacks and severe natural disasters higher likelihoods in the next five years. The Cruel Dependency Here’s where it gets interesting: water and power dependencies run both ways. No power means no pumps. No pumps means no water pressure. No water pressure means failed cooling systems. Failed cooling systems mean more power failures. It’s a cascade effect that transforms localized inconvenience into regional catastrophe. Modern civilization runs on this precarious balance of electricity and water. Lose either one, and the other becomes increasingly difficult to maintain. The Texas power crisis of 2021 wasn’t just a failure of infrastructure — it was a preview of coming attractions.