# NDCA: Marist MM AFF

### Contention 1 – Grid

**US electricity is reliant on gas power plants---it’s bound to collapse due to extreme weather. Diversifying resources that power the grid is key to resilience and reliability.**

Paul Arbaje 24. Energy analyst in the UCS Climate & Energy program. Mark Specht is a Western states energy manager/senior analyst in the program. Gas Malfunction. UCS, 02 January 2024. https://www.ucsusa.org/sites/default/files/2024-01/Gas%20Malfunction\_brief\_1.8.pdf. Accessed 10 September 2024

While the scale of the five **storms** and their impacts **varied** widely, the energy system **failures** were **very similar** across them. A key commonality among all five was that gas plants accounted, by far, for the largest source of generating capacity knocked offline. The cumulative **gas** plant capacity that **failed** during each event was **more than twice** that of the **second**-most-impacted category of capacity (Figure 1). Each storm exposed vulnerabilities of both the gas plant fleet within affected regions and the gas infrastructure that delivered fuel to those plants. The US gas infrastructure system can be grouped into three primary components: production, transportation and storage, and end use, with power plants being the largest group of end users in terms of gas consumed (EIA 2023c). Extreme winter storms can affect all three components, potentially **compound**ing the strain on **gas plants** and forcing many of them to **fail** at the same time. The power and gas systems’ mutual dependence on each other has exacerbated these so-called correlated outages, but these plant failures can also be attributed to the sheer amount of area affected by the weather events in question. The **events** have exposed gas plants and gas infrastructure across large geographic areas to extremely **low temperatures**. Many facilities were unprepared and ill-designed for the low temperatures (Hilbert and Hallai 2021; FERC 2019). Even facilities that were prepared on paper often failed when an extreme storm hit (FERC 2021; FERC 2023). SEVERE WEATHER DIRECTLY IMPACTS GAS PLANTS A primary **cause** of gas plant **failures** is the direct impact of **extreme cold** weather on plant operations and equipment. Across all generator types, the top direct causes of plant outages in each of the major winter storm events related to equipment freezing, as well as to a second category labeled “mechanical/electrical” (FERC 2023). Equipment freezing is often caused by the freezing of particular components, including valves, water lines, inlet air systems, and sensing lines. Mechanical/electrical are non-freezing issues that occur when cold temperatures affect certain plant components. These issues include wiring failure, mechanical wear of valves, and embrittlement of flexible seal materials like rubber and silicone. A troubling pattern in the more **recent failures**, which were largely of gas plants, is that they generally took place when temperatures were **above** the plants’ minimum ambient **temperature** ratings.4 Across fuel types, 81 percent of the freeze-related outages during Winter Storm Uri in 2021 occurred when the temperature was above the generating unit’s minimum ambient temperature rating; that figure was more than 75 percent for Winter Storm Elliott in 2022 (FERC 2021; FERC 2023). SEVERE WEATHER JEOPARDIZES FUEL SUPPLIES Issues related to fuel supply are the second significant cause of lost gas capacity during extremely cold weather. Unlike other thermal power plant types, such as coal or nuclear plants, gas plants generally do **not store** their fuel **on site**. Instead, they **depend** on the real-time **delivery** of gas via pipeline, burning it upon delivery to produce electricity. This distinct characteristic leaves gas plants vulnerable to running out of fuel, since extreme cold weather can **interrupt** both the **production** and the **transportation** of gas. All five storm events involved gas-supply issues (FERC 2021; FERC 2023). The significant drops in gas production during the 2011, 2021, and 2022 storms arose largely due to such issues as “freeze-offs” as liquids in the gas wells, wellheads, and ancillary equipment froze up and blocked the flow of gas.5 During the 2022 event, gas production in the Marcellus and Utica shale formations in the Appalachian Basin dropped by 23 and 54 percent, respectively (FERC 2023). Production dropped even more during Winter Storm Uri in 2021: Texas experienced a 70 percent decrease and the lower 48 states saw an overall 28 percent decrease (FERC 2021). Gas supply issues can also arise even if production does not decrease. The 2014 and 2018 events did not cause significant drops in production even though fuel supply issues arose. In part, these occurred due to pressure drops and other physical issues affecting gas pipelines, but they also resulted from high coincident gas demand from non-power plant end users, such as homes and businesses trying to keep temperatures up. To save money, many gas plant owners choose to sign only “non-firm” or “interruptible” contracts for at least some of their fuel supply and transportation. The contracts of “firm” or “non-interruptible” customers, such as those in the residential sector, are fulfilled before non-firm customers, leaving less gas available to power plants during cold snaps as demand soars for residential heating. Even firm contracts to supply or transport fuel do not give a gas plant a guarantee that it can get fuel if a winter storm is severe enough. During Winter Storm Elliott in 2022, failed gas deliveries under firm fuel supply and/or transportation contracts led to 16.5 GW of cumulative losses of gas plant capacity. This was even more than the 14 GW of capacity lost due to failures to fulfill gas deliveries under non-firm transportation contracts (FERC 2023).6 The mutual **dependence** of the power and gas systems also presents a **vulnerability** with its potential to create a **feedback loop** of failures. Gas plants need fuel to produce electricity, and the gas system needs electricity to supply the fuel. Rolling blackouts can hit **gas production** and processing facilities, **constraining** the amount of fuel supplied to the country’s primary source of electricity, causing **more** rolling blackouts, and so on. FERC estimated that power losses caused 23.5 percent of the gas production drop during Winter Storm Uri (FERC 2021).7 Summer Also Threatens Gas Reliability Extreme summer weather can also pose significant threats to gas plants, even if these are typically less severe than those posed by extreme winter weather. **Heat** waves, droughts, hurricanes, and **floods** can all **affect gas** plants, with heat waves and droughts having the most significant impact. HEAT CAN FORCE POWER PLANT DERATES AND OUTAGES High temperatures can reduce both the efficiency and the maximum generating capacity of gas plants. High ambient air temperatures decrease the maximum generating capacity of gas plants by reducing the amount of fuel they can burn. In addition, gas plants require cooling; as the coolant (water or air) gets hotter, plants are less able to dissipate waste heat. As a result, they operate at lower power (Dumas, KC, and Cunliff 2019). Across all types of generation, extreme heat increases the likelihood of power plant output reductions (or “derates”) and forced outages (NERC 2023). In summer, high temperatures and prolonged operations often occur simultaneously as heatwaves lead to higher electricity demand; the combination can cause unexpected plant breakdowns. For example, many California gas plants were forced offline or significantly derated over the course of a 10-day heatwave in September 2022 (Regenerate California 2023). DROUGHT CAN HAMSTRING WATER-DEPENDENT POWER PLANTS Because many plants use water for cooling, a shortage of cooling water during extreme summer weather can also affect the gas fleet (EIA 2018). In fact, water shortages can force water-dependent plants to shut down entirely. For example, Texas experienced its second-worst drought in the state’s history between 2010 and 2015. As a result, one plant operator took three gas plant units, totaling 403 MW, offline for almost a year until rain replenished the reservoir from which they pulled cooling water (ERCOT 2016). Since then, Texas’s grid operator, ERCOT, has published drought risk analyses that have repeatedly classified more than 10,000 MW of gas plant capacity as at risk over the following 18 months (ERCOT 2023). As the impacts of climate change intensify and lead to more frequent and more severe weather events, the risks that drought poses to the gas fleet may increase significantly. For example, a recent analysis found that under a high-emissions climate scenario, the most severe drought could disrupt 20 percent of ERCOT’s thermal generation in Texas. The results were mixed when the same study looked at whether climate change could lead to an increase in thermal-generation disruptions in the state due to drought (Turner et al. 2021). A Reassessment of Gas Plants’ Contributions to Grid Reliability Is Overdue **Extreme weather** events, in both winter and summer, illustrate the **fragility** of **gas** plants. They also highlight the clear need to **reevaluate** the **assumed** contributions of these resources to **grid reliability**. For far too long, programs to ensure the ability of electricity supplies to meet customer demand (often referred to as “resource adequacy”) have overvalued the reliability contributions of gas plants. The methods used to evaluate resource adequacy can have multiple implications. First, the chosen method directly determines the contribution of existing resources, using the result to inform how much the owner of the resource gets compensated for that contribution. Second, when utilities and regulators make decisions about new resource investments, resource adequacy can be a major factor tipping the scales in favor of certain resource types. Finally, and most important, overestimating the contributions of certain resource types can ultimately lead to power outages. This has been the case especially for gas plants, which **failed** at an **unprecedented scale** during recent extreme winter storms.

#### And, commercial investment in nuclear energy increases opportunity to meet increasing demand

Ferrechio 4/2 [Susan, 4-2-25, Next-gen nuclear reactors poised for surge in U.S. power grid, https://www.washingtontimes.com/news/2025/apr/2/next-gen-nuclear-reactors-poised-surge-us-power-grid/]

A manufacturing plant in Texas plans to power its production with an advanced nuclear reactor instead of natural gas, advancing the Trump administration’s push to unleash commercial nuclear power in the U.S. When completed, the nation’s first grid-scale advanced nuclear reactor will power a 4,700-acre facility that produces plastics and other materials used in dozens of products. Dow Chemical and the nuclear energy engineering firm X-energy submitted a construction permit this week to the federal government for a small modular reactor, or SMR, at Dow’s Seadrift, Texas, manufacturing site. The reactor will replace an aging natural gas plant and eliminate nearly all greenhouse gas emissions. The permit is the first step in an anticipated resurgence in nuclear power. Mr. Trump initiated the nuclear power comeback during his first administration, and nuclear power is now set to skyrocket as the president seeks to rebuild the U.S. manufacturing base and establish the nation as a global leader in artificial intelligence. X-energy CEO J. Clay Sell said the Dow project “will demonstrate how the technology deployed at Seadrift, Texas, can be quickly and efficiently replicated to meet incredible power demand growth across America.” Enabling commercial nuclear power projects is a top priority of the Energy Department. Secretary Chris Wright announced in February that the department would “work diligently and creatively to enable the rapid deployment and export of next-generation nuclear technology.” He is following orders from Mr. Trump, who, just days into his second administration, said he would use an emergency declaration to expedite the building of plants needed to provide energy to artificial intelligence data centers. The president said the plants can use any source of power, including coal, but SMRs are poised to play a pivotal role. The technology has been in development for years but has never been deployed in the U.S. A handful of SMR plants are running in Russia and China. Under the Trump administration’s pro-nuclear energy policies, SMR plants are poised to advance rapidly. SMR plants are smaller than traditional water-cooled nuclear power plants and can be built quicker and cheaper. SMRs can use a variety of coolants, so they do not need to be positioned near large water sources. They produce about a third of the energy of a traditional nuclear reactor. The multiple modules SMRs allow the plants to conduct maintenance without shutting down entirely, as is required with large-scale nuclear power facilities. Mr. Trump has been promoting SMR technology since his first term and promised during his 2024 campaign to get SMR plants up and running. “These can be built ultra-safe. They are ultra-clean, and they’re very low-cost. But they are absolutely safe,” he told voters in York, Pennsylvania, in August. Big Tech companies have started investing significantly in the plants, hoping they will provide clean energy to power AI technology. In October, Google touted “the world’s first corporate agreement” with Kairos Power to deploy multiple SMRs in the U.S. beginning in 2030 to provide electricity to Google data centers. The tech giant said the deal accelerates the advancement of clean, round-the-clock energy needed for power-hungry AI. Days after Google’s announcement, Amazon said it would invest $500 million in three SMR projects that will power its data centers and provide electricity for homes and businesses. Amazon’s investments include support for a 320-megawatt X-energy project with the regional utility Energy Northwest in Washington state. Amazon’s agreement with X-energy pledges to bring 5 gigawatts into the power grid by 2039, which would become the largest commercial deployment of SMR technology. Other investors include Citadel CEO Kenneth C. Griffin. Construction of the Dow Seadrift project is expected to begin next year and be completed by the end of the decade. The energy-intensive plant manufactures plastic products such as food containers and drip irrigation tubing. It also manufactures glycols used in antifreeze, polyester fabrics and bottles. “What attracted them to X-energy was that our plant configuration is four modules that produce about 320 megawatts,” said Carol Lane, X-energy’s vice president of government affairs. “It gives very, very high reliability, which is something that the data centers and AI centers really care about.” Energy demand in the U.S. is forecast to increase by nearly 16% by 2029, according to GridStrategies, a clean-power consulting firm. “We are looking at the highest growth in electricity in maybe 30 or 40 years or longer,” Ms. Lane said. “We think these small reactors have a smaller footprint and have a much higher energy density you’ll be able to deploy many of them around the country.” The Seadrift project is set to become one of the nation’s first operational small modular reactors. The X-energy project planned for Dow’s Seadrift facility will use helium gas in the reactor core to cool billions of uranium-filled pebbles. The gas flows over the pebbles, heats up to nearly 1,000 degrees Fahrenheit and flows to a steam generator that will power the manufacturing plant. Kairos Power’s technology, which will provide electricity to Google data centers, will use a molten-salt cooling system to heat a steam turbine that generates power. The uptick in SMR projects follows the spectacular failure of Oregon-based NuScale Power’s six-reactor project at the Idaho National Laboratory. Mr. Trump’s first administration agreed to fund up to $1.4 billion for the project, which by 2029 was supposed to be generating enough electricity to power 300,000 homes. The Biden administration also funded the development of the plant. It was canceled in late 2023 because of cost overruns and too few subscriptions from area power providers who were wary of the untested SMR technology. Big Tech, with its need for reliable energy and desire to cut carbon emissions, is backing the technology. Mr. Trump plans to clear a regulatory path for its advancement. “If you can get the first ones built and demonstrated, we think the confidence level is just going to continue to increase in terms of where you could put these plants,” Ms. Lane said.

#### And it’s key to grid stability

Latief 23 [Yusuf, 11-13-23, Grid reliability: Is nuclear the stabiliser we’ve been looking for?, https://www.smart-energy.com/industry-sectors/energy-grid-management/grid-reliability-is-nuclear-the-stabiliser-weve-been-looking-for/]

Grid stability is consistently brought up as a key puzzle that needs to be solved to reach our net zero targets. One often overlooked piece, states Bernard Salha, group technical director and R&D director for French energy giant EDF, might be found in nuclear power. Although the volume of renewable energy sources coming online is an accolade worth touting, the issue behind intermittency persists. However, an answer might just be found in the role of nuclear and Salha, in an Energy Transitions Podcast episode, stated his confidence in this being the case: “Nuclear is clearly an asset to cope with the question of overall intermittency and, let me also say, the question of global stability of the grid. “The big question with renewables is that you have electricity (only) when you have wind or when you have sun…” The go-to answer for this intermittency conundrum is the use of storage systems, whether battery or long-duration, which can be co-located with renewable power plants to store energy when generated and discharge back to the grid during peak hours of demand. owever, states Salha, storage technology is not yet at a level where it can be fully relied on to keep our grid in check for the foreseeable future: “…the development of storage, at least of big (enough) volumes of storage, is not yet here, and is probably not going to be here for a very long time. “There are technical devices, which allow us to have stability on the grid – grid forming systems for example – but nuclear could help also in that respect by its natural inertia. And nuclear is flexible – that’s a key element I really want to stress; nuclear is flexible. “On our French fleet, we have reactors, which can increase (…) or decrease power very fast; the technical spec, with grey rods to which the reactors are equipped, is of 3% full power per minute. “Nuclear power plants can follow the load, and consequently, they can help to bring stability on the grid.” According to Salha, ensuring the stability of our grid systems needs to be recognised as a crucial element for the success of the energy transition as, with increasing shares of electricity and renewable energy coming online, its functioning will need to be maintained throughout. “As each share (of energy) is going to be larger and larger; we need a strong grid and a stable grid. “And in that respect, a nuclear power plant with the flexibility and capacity to follow the load is clearly an asset in this global, complex landscape.” According to Salha, a way in which the integration of nuclear, as a decentralised flexible load, can be efficiently coordinated is through the use of smart grid technologies. In fact, it is not a way, but rather the way: “The question of this very big increase in electricity means that we are going to have a lot of different demands – (from) EV charging stations, heat pumps, industrial customers – and we will have to manage the global stability, the global frequency, of the grid… “It means that all these global systems have to use digital tools. Digital tools in that respect are mandatory if we want the system to be able to operate. All the AI techniques, all the tools which may help the global operators in charge of the management of the grid to work are going to have a great effect and are completely necessary.

**Gas dependence itself underscores grid failure, amplifying energy inequality.**

Vivian Yang 24. Western states energy analyst for the Climate & Energy program at the Union of Concerned Scientists. Reliance on Gas Power Plants Fuels Inequity. The Equation, 10 January 2024. https://blog.ucsusa.org/vivian-yang/reliance-on-gas-power-plants-fuels-inequity/. Accessed 10 September 2024

An electric system that is over-reliant on **gas** can contribute to **higher** and more **volatile** electricity **bills**. Furthermore, thermal resources (gas, coal, and oil) are often overvalued for their contribution to maintaining grid reliability. Not only is this bad for keeping the lights on, but it means that gas power plant **owners** are being **overpaid** and those extra payments are coming from customers. During Winter Storm **Uri** in 2021, a devastating storm where power outages contributed to **hundreds of deaths**, Texans saw the extreme of price volatility from over-dependence on the gas system in a competitive power market. Wholesale electricity prices rose **7,400%**, in part because gas plants disproportionately **failed** in the **cold weather** causing electricity supply shortages. Higher and more volatile electricity bills are particularly difficult for households with a higher energy burden. Studies show that **low-income** households spend almost **9%** of their **income** on **energy**, on average, compared to 3% for non-low-income households. And compared to **white** households, **Black**, **Latinx**, and **Native** households spend between **20** and **45% more** of their income on electricity bills. Compounding effects on other vulnerable populations The disproportionate effects that all these harms have on communities of color and low-income communities is well documented, but it doesn’t end there. These harms **intersect** across social segments, particularly affecting other **vulnerable populations**. For example, older adults are more vulnerable to heat waves due to aging immune systems, higher likelihood of dehydration, and more limited mobility. In the 2022 summer heat wave in Europe, 90% of heat-related deaths were people aged 65 and older. Exposure to air pollutants emitted from gas production aggravates existing respiratory illnesses and has been linked to increased childhood asthma rates. Gas plants are more likely to be in communities with limited English proficiency, making it more difficult for these communities to advocate for stronger pollution standards or plant retirements. Farmers must deal with increasingly extreme weather events and land degradation from gas infrastructure that put their livelihoods at risk. Wells drilled for fracking near drinking water sources have been linked to higher incidences of pre-term births and low birth weight. This is a small snapshot of how the power grid’s **reliance** on **gas** harms **vulnerable populations**. When intersected with low-income communities and communities of color, these compounding burdens breed more extreme inequality. So, why is the grid still so reliant on a resource with such known inequitable harms? Steps towards a more equitable grid Gas is often touted by its champions as the key to grid reliability. It indeed accounts for 40% of the electricity currently generated for the grid. But studies show that at least 80 to 90% of the US grid could be reliably served with renewable energy and there is limited to zero need for new gas plants for reliability. On top of that, the gas-for-reliability **narrative** is increasingly **under scrutiny** as gas plants and the associated infrastructure disproportionately **fail** in extreme weather conditions. Gas doesn’t need to be the crux of a reliable electric grid. And based on the challenges gas faces in extreme summer weather in addition to its alarmingly poor track record in extreme winter weather, it shouldn’t be. As the country moves to phase out its reliance on gas and other fossil fuel resources, equity needs to be a much bigger part of the discussion. Grid planners should prioritize the retirement of gas plants and related infrastructure in low-income communities and communities of color. In parallel, there should be more concerted efforts to break down the barriers to the clean energy buildout. These reforms will be a much bigger boon to grid reliability and grid equity. Unfortunately, we can’t undo the long history of harm that the energy system has disproportionately placed on communities of color, low-income communities, and vulnerable populations. But we can plan to transition to an electric grid where equity is underscored in the design and decision-making processes. **Clean energy**, done right, **avoids** many of the very **harmful** impacts of **gas**-fueled power plants. The work we do now to create an equitable grid can have transformative benefits for communities and ultimately contribute to a fairer and healthier society and planet.

**Nation-wide grid collapse is likely and causes existential nuclear meltdowns.**

Mark Leyse 24. Former Nuclear Engineer, University of Wisconsin; Nuclear Safety Analyst and Consultant. Spent nuclear fuel mismanagement poses a major threat to the United States. Here's how. Bulletin of the Atomic Scientists, 4-2-2024. https://thebulletin.org/2024/04/spent-nuclear-fuel-mismanagement-poses-a-major-threat-to-the-united-states-heres-how/. Accessed 10-9-2024

The relatively **high probability** of a nationwide grid collapse, which would lead to multiple **nuclear disasters**, emphasizes the need to expedite the transfer of spent fuel to dry cask storage. According to Frank von Hippel, a professor of public and international affairs emeritus at Princeton University, the impact of a **single accident** at an overstocked spent fuel pool has the potential to be **two orders of magnitude** more devastating in terms of radiological releases than the three **Fukushima** Daiichi meltdowns combined. If the US grid collapses for a lengthy period of time, society would likely descend into **chaos**, as uncooled nuclear fuel burned at multiple sites and spewed **radioactive** plumes into the **environment**. The **value** of preventing the destruction of US society and untold human suffering is **incalculable**. So, on the issue of protecting people and the environment from spent fuel pool fires, it is surprising when one learns that promptly transferring the nationwide inventories of spent fuel assemblies that have been cooled for at least five years from US pools to dry cask storage would be “relatively inexpensive”—less than (in 2012 dollars) a total of $4 billion ($5.4 billion in today’s dollars). That is far, far less than the monetary toll of losing vast tracts of urban and rural land for generations to come because of radioactive contamination. One should also consider that plant owners are required, as part of the decommissioning process, to transfer spent fuel assemblies from storage pools to dry cask storage after nuclear plants are permanently shut down. So, in accordance with industry protocols, all spent fuel assemblies at plant sites are intended to eventually be placed in dry cask storage (before ultimately being transported to a long-term surface storage site or a permanent geologic repository). If the NRC continues to allow the industry’s **mismanagement** of spent fuel to pose an **existential threat** to the **U**nited **S**tates, Congress must be compelled to pass legislation requiring utilities to swiftly thin out spent fuel pools.

**Collapse destroys life-affirming infrastructure. It’s an existential threat.**

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In the industrial world, when a switch is flipped, we take for granted that it will produce light, boot a computer, illuminate a stadium or activate a power plant. We know, of course, that power losses can and do occur. Many of us have lit candles during a thunderstorm or brought out extra blankets when a blizzard takes down transmission lines. As of this writing, the most populated state in the United States, California, is experiencing rolling blackouts.1 Yet even in prolonged power outages, we expect that electricity will be restored and, consequently, life will return to normal. Perhaps we need ask, however, what if power **cannot** be restored in a timely manner? Concern is growing that in the not-too-distant future our electricity supply could be irreparably compromised by a cyber attack. The issue when considering a systemic grid failure of this nature is twofold: how did we reach a point where something so **critical** to **routine life** now presents an **existential threat**, and what can we do to **mitigate** the risk of a catastrophic grid attack? This article posits that the emergence of cyber attacks on industrial control systems, as a means of war or criminal menace, have reached a level of sophistication capable of crippling those systems. This article argues that a new grid security policy paradigm is required to thwart catastrophic grid failure – a paradigm that recognises the inextricable link between commercial power generation and national security. In section 5, seven policy recommendations are outlined that may, in part, mitigate a future where grid attacks pose **existential risk** to nations and their citizenry. Those recommendations are: first, develop a comprehensive insurance programme to minimise the financial risk of grid disruption; second, train more cybersecurity professionals with particular expertise in industrial control systems; third, institute a federally mandated information-sharing programme that is centralised under United States Cyber Command; fourth, subsidise and/or incentivise cybersecurity protections for small to mid-size utilities; fifth, provide university grants for grid security research; sixth, integrate new technologies with an eye towards securing the grid; and, lastly, formulate clear rules of engagement for a military response to grid disruption. The purpose of this article is to provide the reader with an introduction to this complex topic. It is the aim of the author to give orientation to this issue and its many branches in the hope that better understanding will animate further curiosity and, ultimately, positive action on the part of the reader. Although many skilled and earnest people work tirelessly to prevent a grid failure scenario, it is essential that more be added to their ranks each day. Advisors, engineers, regulators, private counsel to power generators, and many others who play roles in electric power production are crucial to this subject. So, while this article provides entrée to the topic of grid security, its long-term objective is to spur action by the entire energy-related community. In the end, no one is immune to consequences of grid failure and, therefore, everyone is responsible, in part, for promoting grid integrity.2 In this regard, lawyers who represent various actors in the energy sector are going to be faced with questions and potential legal risks of a magnitude that they have never experienced before. 1.2. Turning the power back on in a powerless world ‘Black start’, not to be confused with the term ‘blackout’, is the name given to the process of restoring an electric grid to operation without relying on the external electric power transmission network to recover from a total or partial shutdown.3 At first glance, this description is unremarkable, but it implies a disturbing catch-22 – how might one restore power if the entire external transmission network is compromised? If an electric disruption occurs at a household level, some homes may be equipped with a modest gasoline generator to temporarily restore power. If a hospital loses power, it will almost invariably be resupplied by automatic, industrial-scale generators. These **micro** considerations hardly give **anyone pause**; they are hiccups on a stormy night or a snowy day. In other words, their ‘black start’ is a quick and effective process for restoring power. But what happens, at a macro level, when an electric **grid** supplying power to **large portions** of the **U**nited **S**tates goes black, or worse, what happens if **all** of the United States’ electric grids go down **simultaneously?**4 In that scenario, how might enough non-grid power be harnessed and transmitted to turn the United States’ lights back on? Moreover, how might such a catastrophe occur in the first place? Perhaps the more **ominous question** is **not how**, but **whether or not we can survive** such circumstances if they persist in the long term. The United States electric grid (‘the grid’) is the ‘largest interconnected machine’ in the world.5 It consists of more than 7000 power plants, 55,000 substations, 160,000 miles of high-voltage transmission lines and millions of low-voltage distribution lines.6 The scale and complexity of the grid in the context of the modern digital world are beyond comprehension because within it are innumerable industrial control systems; incalculable connections to digital networks; millions, if not billions, of analogue or digital sensors; many thousands of human actors; and trillions of lines of programming code.7 Further complexifying the grid is that it is comprised of generations of technologies, stitched together in ways that are not inherently secure in a world of cyber threats.8 The vastness of the grid makes security of it challenging. Likewise, the **vastness** of the grid makes the opportunities for intrusion **seemingly infinite**. By **any measure**, grid **failure** will unleash a **parade of horrors**. **Stores** would **close**, **food** scarcity would follow, **communication** would cease, **garbage** would **pile up**, planes would be grounded, clean **water** would become a **luxury**, service stations would yield **no fuel**, **hospitals** would eventually **go dark**, financial **transactions** would stop, and this is only the **tip of the iceberg** – in a prolonged grid failure **social chaos** would reign, once-eradicated **diseases** would **re-emerge** and, increasingly, hope of returning to a normal life would fade.9 The notion of complete grid failure, once relegated to science fiction comics or James Bond movies, is now not only possible but also one of the most pressing national security threats today.10

## Climate Leadership

#### Paris withdrawal puts climate leadership up for grabs

Gibson 25 [Kalina Gibson, dual degrees in economics and environmental science and policy from the University of Maryland. 1-21-25, The Trump Administration’s Retreat From Global Climate Leadership, https://www.americanprogress.org/article/the-trump-administrations-retreat-from-global-climate-leadership/]

As climate disasters grow in frequency and intensity, from devastating wildfires to relentless hurricanes to record-breaking heat waves, the Trump administration has once again taken a step that threatens to deepen the climate crisis: formally announcing the United States’ withdrawal from the Paris Agreement. In the midst of an escalating climate crisis that’s upending livelihoods and lives, this decision raises urgent questions about the future of national and global progress. Namely, what does it mean for the international climate effort to combat climate change when the world’s largest historical emitter steps away from the table? And what are the implications for Americans already grappling with the mounting costs of a warming planet? Since its adoption in 2015, the Paris Agreement has represented a historic act of global solidarity and a framework for collective accountability in addressing the climate crisis. Nearly 200 nations committed to curbing greenhouse gas emissions, bending the global emissions curve, and striving to limit warming to 1.5 degrees Celsius. While progress has been uneven and insufficient, the agreement underscores the power of collective action. At the same time, it fosters transparency and accountability, enabling nations to measure their ambition and progress against one another. This dynamic has not only spurred innovation but also inspired nations to vie for leadership in the global clean energy economy, proving that addressing climate change is both a shared responsibility and a pathway to prosperity. President Donald Trump’s decision to again withdraw does not reflect a failure of the Paris Agreement, but rather signals a profound abdication of leadership. The United States now joins Iran, Libya, and Yemen as the only countries in the entire world not party to the agreement. Other countries have already reaffirmed their commitments to the agreement by announcing their updated nationally determined contributions (NDCs) in an effort to uphold the agreement’s goal despite America’s retreat. Yet the withdrawal sends a troubling message: The United States is an unreliable partner. This is not just about one nation stepping back; it is a deliberate weakening of the multilateral system at a time when global unity has never been more critical to combat the climate crisis. In addition, it will serve to amplify the voice of China, the world’s largest greenhouse gas emitter still at the table. The question now is whether global momentum can overcome the absence of U.S. federal leadership—and what role subnational actors, international partners, and everyday citizens can play in ensuring climate progress continues, even as the clock ticks ever louder.

#### And, investment in nuclear energy is the only way to restore leadership

Pazzanese 25 [Christina Pazzanese, Master of Arts in Regional Studies, News writer at Harvard University, 1-7-25, “Nuclear has changed. Will the U.S. change with it?,” https://news.harvard.edu/gazette/story/2025/01/nuclear-has-changed-will-the-u-s-change-with-it/]

Fueled by artificial intelligence, cloud service providers, and ambitious new climate regulations, U.S. demand for carbon-free electricity is on the rise. In response, analysts and lawmakers are taking a fresh look at a controversial energy source: nuclear power. Two new reactors in Georgia are the first in consecutive years in the U.S. since 1990. In June, Congress overwhelmingly passed the ADVANCE Act, a bipartisan bill that boosts the number of reactors coming on line. Late last year, tech giants Google, Amazon, and Microsoft all pledged to invest in small reactors to help meet their future energy needs. In this edited conversation with the Gazette, Daniel Poneman, a senior fellow at the Belfer Center, discusses the growing momentum behind nuclear power plants. Poneman served as deputy secretary of energy and chief operating officer at the U.S. Department of Energy from 2009 to 2014. From 2015 through 2023 he was CEO of Centrus Energy, a supplier of nuclear fuel to power plants around the world. Is nuclear power making a comeback? I believe the answer is yes, because we have new factors present and they’re all converging to add momentum to nuclear. For a long time, a lot of people have been worried about climate change and reducing carbon emissions. The only source of clean power that’s been proven to work — day or night, season in, season out, in any geographic location, and successfully operating at large scale — that’s nuclear. It’s just shy of 20 percent of our total electricity production and nearly half of our carbon-free electricity. On top of that is this vertiginous increase in electricity demand that’s driven by 1) the AI revolution and 2) the effort to decarbonize not only power generation, which is about one-quarter of total emissions, but also transportation and industrial processes. If you have electric vehicles and you get the power for the vehicles from coal plants, you haven’t solved the emissions problem. The last factor is the hyper scalers, which have the wherewithal and frankly the balance sheets to support these very substantial investments in nuclear. So, you have all of those market-driven factors and strong recognition by the government of the importance of nuclear. I don’t think there’s any issue that has broader or deeper bipartisan support than this one. All of these things are converging to add new momentum to American nuclear energy. Historically, opposition to nuclear power has been linked to safety and environmental concerns — including waste — and on the business side, to high costs and low profits. What’s different — is today’s nuclear power safer, cleaner, more cost-effective? In terms of security, when people were concerned after 9/11, changes were undertaken. And obviously, a lot of lessons were drawn after Fukushima. There has been a continuous set of improvements over the years. When you ask what’s different: There is a whole new generation called advanced reactors. One of the problems over the years is that large reactors got larger and larger, and each one became a bespoke project. There were too many change orders within a single reactor project, and that just kills you on budget. One thing is to go to factory-built, small reactors that can be standardized, punched out like a cookie cutter, the same design over and over. The more of these things you punch out, the cheaper it gets, and the more practice you have installing them, the cheaper it gets. If you do things like that, you can improve on safety and budget. The waste issue depends on the specific reactor technology. Some advanced reactors are based on existing Gen III designs, so their waste would be the same but with smaller quantities because the reactors are smaller. Gen IV reactors use fast neutrons, which allow a more efficient use of fuel and therefore a reduction of total volumes. Some Gen IV reactors can burn used fuel that has already been irradiated, which would have the effect of both burning out some of the minor actinides and turning what is now considered “waste” into a source of more energy. At the end of the day, all nuclear waste, whether from current generation or advanced reactors, will need to be disposed in deep geologic formations; this is a safe process with well-known technology. The Biden administration late last year announced several new U.S. nuclear benchmarks at the United Nations Climate Change Conference. Are those goals realistic? They’re ambitious, but I think they’re necessary if we’re going to reach our targets. At the Belfer Center, I’m working on a project on how to get 200 gigawatts of new nuclear built in the United States by 2050. A bunch of things have to happen right for that to be achievable. But I have great confidence that when there’s something that’s truly important, and people in the United States put their minds to it, we can do great things. But it’s going to take smart government policies. We’re going to have to have lean and effective regulations. We’ve got to figure out a way to spread the cost and risk sufficiently, so you induce people to act sooner rather than later. Government loan guarantees that reduce the cost of capital can both defray first-mover risks and also give confidence to the private sector to co-invest. If we concentrate our efforts, we have a chance to restore U.S. global leadership. What factors will determine whether those goals are reached or derailed? Government is going to have to be there in terms of smart tax policy, in terms of providing things like cost-overrun insurance. The government also can be an important source of demand, especially for small and micro reactors that have potential applications such as supporting micro grids for things that can’t afford to go dark — military bases, things of that character. If there’s a cyber threat from an enemy or from some natural event, I would recommend the government buy a bunch of these small reactors to help them get over that first-of-a-kind challenge that is so hard to overcome for private entrepreneurs who can’t wait decades for an adequate return on investment. Private capital can then take the confidence that comes from having strong co-investment and commitments from the federal side. You’re going to have to have the engineering, procurement, and construction contractors who got rusty over the last few decades get back into the game and execute well. And we’re going to have to have the talent pool grow and training programs at the university level, but also in the trades and organized labor. Many thousands and, ultimately, hundreds of thousands of jobs are needed. You’re going to need well-trained people in the supply chain manufacturing these very precise components and parts. It’s going to take a group effort. And to maintain the social license to do this, we have to bring all of civil society along with us. So far, in recent years, you see a lot of very positive movement in that direction.

#### It's specifically key to climate leadership

Baker et al 20 [James Baker III (Law degree from the university of Texas), George Schultz (PhD in industrial economics from MIT), and Ted Halstead (Masters degree from Harvard's Kennedy School of Government), May/June 2020, The Strategic Case for U.S. Climate Leadership How Americans Can Win with a Pro-Market Solution, <https://clcouncil.org/reports/Foreign-Affairs.pdf>]

Although the United States and its trading partners have a long way to go in reducing emissions, a fundamental paradigm shift is occurring. Climate action and economic growth, far from being mutually exclusive, are not only compatible but also increasingly interdependent. The U.S. economy has prospered in recent decades because the U.S. public and private sectors were the frst to embrace the communications and information technology revolutions. The transition to clean energy promises equally far-reaching economic advantages. Nextgeneration renewables and nuclear energy could substantially drive down the perunit cost of electricity, just as the digital revolution drove down costs in recent decades. That is why China is investing so heavily in these sectors. And that is why the United States could be putting its global economic leadership position at risk if it continues to ignore this transformation.

#### U.S. climate leadership is key to mitigating Middle Eastern tensions.

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The United States has a key but indirect role to play in fostering such a dialogue and an interest in its success. Greater U.S. engagement on environmental issues would help the United States remake its image, demonstrate that it can play a productive regional role, and support its strategies of advancing regional integration and promoting de-escalation of tensions in the Middle East.[6] The United States should encourage its Arab Gulf partners to engage in regional environmental dialogue and help connect experts and civil society members around the Gulf to deepen the understanding of shared environmental concerns and solutions. The Necessity of Regional Action Gulf states share many environmental concerns and most of them are supranational. As such, they require multilateral responses.[7] “The Gulf is a single system, and what happens in one place impacts the rest of us,” an Iranian environmental scientist said.[8] Failing to act benefits no one.[9] Water is a priority for all Gulf states. All eight states surrounding the Gulf suffer from high or extremely high water stress.[10] Bahrain is the most affected, with 3,878 percent water stress, meaning it withdraws 38 times as much water as is supplied from renewable resources each year. Iran has greater natural water resources—which it relies on for its large agricultural sector and electricity generation—but the situation is rapidly deteriorating. In June 2023, more than 200 Iranian parliamentarians wrote an open letter warning that water reserves in two provinces would run out within three months, causing a “humanitarian disaster.”[11] Shortages of water have prompted political instability, sparking widespread protest movements in both Iran and Iraq. Most of the region’s water resources are shared. All identified aquifer systems in the Arabian Peninsula are shared between Saudi Arabia and at least one of its neighbors.[12] Meanwhile, Iran is an upper riparian country of the Tigris basin and the Shatt al-Arab, which are critical sources of water for Iraq. Therefore, states have an interest in collaborating on water resources. Air pollution is also a key regional concern. As well as costing states’ economies billions of dollars each year in GDP losses, increasingly frequent dust storms have grounded planes in Iraq, stopped maritime traffic in Kuwait, and downgraded soil fertility in Iran.[13] In May 2022, a large dust storm engulfed Saudi Arabia, Iraq, Iran, Kuwait, and the United Arab Emirates (UAE), hospitalizing thousands across the region.[14] Meanwhile, dozens of dust storms forming in Iraq have crossed into Kuwait and Iran. The transboundary nature of dust storms exacerbates tensions between states. A Kuwaiti professor said some of her students consider dust storms to be the result of their neighbors’ political decisions rather than naturally occurring environmental phenomena.[15] Successfully tackling sand and dust storms requires multilateral efforts.[16] The Gulf itself is a key economic, strategic, and cultural resource, and maritime pollution is a growing concern. Oil, chemical, and biological pollution come from both land and sea-based sources. From the land, domestic sewage, thermal water from desalination plants, and industrial waste infiltrate the water.[17] From the sea, more than 800 offshore oil and gas platforms are prone to spillage, as are the oil tankers that traverse the Gulf.[18] This pollution has increased fish kill events and harmful algal blooms, leading to a loss of marine biodiversity, undermining the fishing industry, and disrupting oil production. An Iraqi activist said that “we know that states in the region have solutions” to pollution from the oil sector, suggesting it is a promising area for cooperation.[19] Counterclockwise currents in the Gulf render Kuwait and Saudi Arabia vulnerable to any radiation leak from Iran’s Bushehr nuclear facility, which is prone to earthquakes since it lies at the junction of three tectonic plates.[20] Serious contamination of the Gulf would risk a water crisis in Saudi Arabia, which relies on desalination for freshwater. Multilateral efforts to combat marine pollution are therefore imperative to ensure regional states’ economic and security interests. Climate change is placing additional pressure on the region. The Middle East is warming twice as quickly as the global average, which exacerbates water scarcity and the risk of dust storms. Extreme heat events are becoming more common and bring health and economic challenges.[21] “Extreme heat and dust storms will undermine oil production in the region as workers will not be able to be outside in these conditions,” an Iraqi academic said.[22] None of these issues can be adequately addressed unilaterally, and the consequences of environmental degradation will ripple across the region. “A breakdown in Iraq’s ecosystem would impact Saudi Arabia, too,” said an Iraqi academic.[23] But despite the imperative of action, some Gulf governments are only just appreciating that climate change could become an existential threat. Gulf States’ Environmental Strategies Environmental cooperation appears to be the obvious solution to these shared concerns, but it remains difficult in practice. Although environmental issues are gaining unprecedented attention among the public, governments tend to drive policy that has limited engagement with civil society experts or scientists, and there is little cooperation at the regional level.[24] Most environmental action in the Gulf is top-down and unilateral. Competition for regional climate leadership between Gulf Cooperation Council states undermines the prospect of regional collaboration. Saudi Arabia and the UAE seek to engage on climate as middle powers and pursue a leadership role on climate in the Middle East and beyond. At times, this competition has threatened to derail action. In 2021, Saudi Arabia reportedly pressured the UAE not to sign a major solar energy deal with Israel and Jordan because the Saudi crown prince felt it undermined his plans for regional climate leadership.[25] The UAE was the first state in the region to devote serious attention to climate issues. The UAE has hosted the International Renewable Energy Agency since 2009, when it became the first developing state to host a major international organization. The UAE is also a regional leader on nuclear energy and is building the region’s first multiunit nuclear energy plant.[26] When Dubai hosts the 2023 UN Climate Change Conference (COP28) in late 2023, the UAE’s environmental ambitions will receive unprecedented international attention. The Saudi government knows oil producers will come under increasing international scrutiny as the energy transition advances, so it has begun to highlight its efforts toward environmental sustainability. The government is also keen to “flex its regional leadership muscle” and has found environmental action to be a promising line of effort.[27] At the domestic level, it launched the “Saudi Green Initiative,” which it describes as a “whole-of-society” approach to address climate change.[28] The initiative includes targets to cut emissions, grow the green economy, and protect the land and sea. The government also committed to environmental sustainability in its megaprojects, such as Neom and The Line, but much of this rhetoric is yet to materialize. Saudi Arabia’s “Middle East Green Initiative” is the embodiment of its regional ambitions.[29] However, the government has released little information about what the initiative will involve or when its activities will begin.[30] Iran has officially recognized climate change as an existential threat, but it prioritizes action on other areas. A former Iraqi minister said, “Iran may not feel it has the luxury to respond to environmental issues, because it has more pressing priorities, like security challenges stemming from U.S. threats to its regime.”[31] Some Iranian officials blame the United States for its environmental woes, arguing that climate change is “propagated by imperialism” and that U.S. sanctions undermine its climate efforts.[32] Although sanctions do not directly cause Iran’s climate issues, the regime resorted to ill-conceived coping mechanisms to sustain its economy and pursue self-sufficiency, which have placed additional strain on its natural resources.[33] Recently, the Iranian regime has sought to bolster its diplomatic role by convening various regional conferences on environmental issues. Iraq witnesses the effects of climate change and environmental degradation most directly of all Gulf states, from water shortages to debilitating dust storms. However, the government does not yet see climate change as an existential threat.[34] A former minister said, “The Iraqi government’s strategic plan does not mention dust storms in particular and its budget will not allocate funds to tackle them in a serious way.”[35] Iraq only ratified its nationally determined contribution to the Paris Agreement in December 2021, a full five years after the agreement went into effect, and has lost out on opportunities to access climate financing as a result. Smaller Gulf states demonstrate differing levels of environmental focus. States like Bahrain and Kuwait are largely late to the game and wait for their neighbors to lead on climate action. These states are not just waiting for investment in environmental initiatives, but also for the spillover effect that comes when influential states in the region push other governments to tackle environmental issues.[36] Although some Gulf states’ unilateral environmental initiatives are ambitious, an analyst warned that “other Gulf states are unlikely to sign up for something that they did not help shape.”[37] Regional collaboration on a new initiative is therefore necessary. A New Climate for Diplomacy Conditions are currently ripe to push for environmental diplomacy. Regional environmental action is a growing priority for states in the Gulf, the tools to tackle some environmental issues are readily available, and recent normalization agreements create a new impetus for regional diplomacy. Environmental dialogue has proven productive in other contexts. Environmental issues are gaining unprecedented attention among both the different populaces and governments in the Gulf. Record temperatures, water shortages, and increasingly frequent dust storms are clear evidence for the public of the changing climate.[38] Across the region, states have emphasized environmental issues, including by forming new ministries, renaming national oil companies, setting national climate targets, and hosting environmental dialogues.[39] COP28 in Dubai will bring unprecedented attention to environmental issues in the region, and this increased attention will prompt greater government prioritization of climate action. Governments are also articulating the necessity of regional action.[40] Saudi Arabia’s “Middle East Green Initiative” shows its ambitions to engage on climate issues outside of its own borders. COP28 in Dubai will feature a series of side discussions on regional climate issues. And Iran has a clear interest in regional collaboration on sand and dust storms because it is largely downstream of storms that form in neighboring states.[41] Gulf states are also able to lead their own environmental initiatives. The necessary technology and tools to tackle climate and environmental issues are increasingly available, reducing regional states’ reliance on external actors to facilitate environmental action.[42] For example, many technologies that reduce greenhouse gas emissions and advance environmental sustainability, such as renewable energy systems and smart agricultural technologies, are readily available off-the-shelf and do not require technological partnerships with Great Powers.[43] The region also has a wealth of homegrown climate expertise. Iranian scientists are global leaders, and graduates of a sustainable water management program at Oman’s state university are well-placed to use their expertise across the region. It is the opportune moment to use environmental cooperation as a confidence-building measure. Because there has been relatively little environmental action to date, a Saudi climate expert said, “There are lots of low-hanging fruit.”[44] Conservation efforts, greening initiatives, and efforts to reduce pollution are just a few of several promising areas for coordination and cooperation that exist right now. It will become harder to tackle environmental issues a decade from now, as the energy transition will have advanced considerably and the remaining environmental issues will require more fundamental shifts in behavior for Gulf states.[45] Those two trends will make confidence building harder in the future. The recent normalization agreements also provide a new window of opportunity to test the potential for environmental diplomacy. These agreements demonstrate Gulf states’ desire to de-escalate and reveal that both Saudi Arabia and Iran have determined the cost of continued hostilities outweighs the benefit. These states have expressed their desire to find areas of cooperation. In a June 2023 tour of Arab Gulf capitals, the Iranian foreign minister expressed his interest in a regional dialogue.[46] It is the opportune moment to use environmental cooperation as a confidence-building measure. Environmental dialogue in other contexts has helped normalize contact between adversaries and has prepared the ground for negotiations on more challenging areas. In the 1990s, the Madrid process included multilateral tracks on the environment and water, which facilitated contact between Israelis, Palestinians, Jordanians, Syrians, and Egyptians for the first time and built the foundation for talks on more difficult issues. More consequentially, the Trifinio Plan promoted local economic development and sought to control environmental change in the border area between rival states in Central America. It was the foundation of increased coordination and cooperation between El Salvador, Honduras, and Nicaragua and was “instrumental in developing the idea of a more closely integrated Central America,” which endures to this day.[47] More recently, in the context of heightened tension levels between the United States and China, efforts to tackle climate change have been a key area of cooperation. Environmental dialogue is often successful because the issues are seen as less contentious and because talks are dominated by technical experts rather than politicians.    Enduring Obstacles Despite its promise, environmental collaboration must overcome several challenges. An ongoing lack of trust, diverging interests, and an institutional lacuna are the greatest obstacles to environmental collaboration in the region. The normalization agreements are still new, and Gulf states are distrustful of others’ motives. A Tehran-based political scientist said that since President Trump withdrew from the Iran deal in 2018, the Iranian regime fears that even negotiations on something as benign as air pollution could open them up to security risks.[48] For these reasons, states in the region are hesitant to share any environmental data. The uncertain trajectory of relations with Iran also deters Arab Gulf states from making major investments. Saudi investors say they have little incentive to support projects in Iran or Iraq amidst political uncertainty out of a fear of investing in soon-to-be stranded assets.[49] The lack of trust even frustrates collaboration between civil society members. An Iranian oceanographer said authorities refused to allow scientists to share seismic data with Omani counterparts due to national security concerns.[50] Cultural tensions also undermine his ability to collaborate with his Arab neighbors. When banners at a Regional Organization for the Protection of the Marine Environment (ROPME) meeting in Tehran referred to the “Persian Gulf” (as opposed to the “Arabian Gulf”), some Arab participants became angry.[51] They then refused to organize future workshops with his institute. Some environmental issues are still seen in zero-sum terms, and diverging interests work against collaboration. For these reasons, water diplomacy remains a distant prospect. If a regional state agreed to share some of its water resources with its neighbors, it would bolster the neighbors’ standing at its own expense. Some interviewees also doubted that Saudi Arabia would engage in any environmental action that would strengthen the Iranian regime in the process, and they suggested that the costs of engaging with Iran may outweigh the benefits. The parties to the Abraham Accords need to balance their relationship with Israel when they consider collaborating with Iran, and the prospect of Saudi Arabia normalizing with Israel may also constrain its freedom of movement in environmental diplomacy with Iran.[52] Finally, an institutional lacuna means there is no obvious venue to host environmental diplomacy in the Gulf.[53] ROPME is the only organization that includes all Arab Gulf states and Iran, but interviewees stated that it has been largely inactive in recent years and that Iranian participation is minimal.[54] “It seems like more of an Arab organization than a regional one,” an Iranian scientist said.[55] Beyond ROPME, it is not clear which areas of the countries’ different governments or even which UN agency has ownership of these issues.[56] This institutional gap also undermines the establishment of common understanding on environmental issues. “The impact of climate change in the region has not been clearly established with data,” a Qatar-based climate activist said.[57] Making Environmental Diplomacy Work Despite the challenges, environmental diplomacy holds unique promise in the region. Environmental dialogue would build routine contact between governments in the region and serve as a confidence-building mechanism. It could also lead to the establishment of economic ties further down the line. Even if dialogue does not yield significant environmental collaboration, it would serve other goals. Minor or symbolic forms of collaboration could demonstrate the benefits of cooperation to populaces and governments alike. Therefore, Gulf states should pursue a step-by-step approach, beginning with small interventions and then expanding.[58] An agreement for regional states to increase their efforts toward protecting biodiversity would be a promising first step. Biodiversity is a unifying issue that does not require significant intergovernmental activity and has clear storytelling value.[59] For example, each Gulf state could nominate an endangered species and encourage its neighbors to support its efforts in protecting it. If successful, these efforts could then widen to maritime conservation, including efforts to curb the pollution of the Gulf and combat illegal fishing.[60] Expanding Saudi Arabia’s tree planting initiative to Iraq as part of an effort to combat dust storms would also serve as a helpful early step, which would benefit Iran as well. Although its results would not manifest in the short term, it would be clearly visible to the public in the affected areas.[61] Environmental dialogue would build routine contact between governments in the region and serve as a confidence-building mechanism. For these first efforts, diplomats should focus on the process rather than the outcome.[62] If these efforts can normalize diplomatic contact and discussions on less sensitive issues, they could buy some calm. It is critical that these efforts have local design and do not rely on external experts that impose their preconceived ideas on the process. Conveners should also stress terms that resonate with all actors in the region. For example, references to Islamic values of stewardship of the environment will be more effective than rhetoric about greenhouse gases and man-made climate change. Although environmental diplomacy can only succeed at the government level, nongovernmental actors can support it in helpful ways. Collaborations between academics from different states working on environmental issues could create a common body of evidence on climate change’s effects in the region. Experts can also help influence their governments’ approach to environmental diplomacy by providing ideas at both the technical and political levels. In addition, they can sell the wide-reaching benefits of environmental action to government officials, including its ability to bolster food security, improve health, and bring economic benefits. For example, the credit rating agency Moody’s integrates environment, social, and governance (ESG) risks into its credit analysis for all sectors globally.[63] The U.S. Role The United States would benefit from regional environmental diplomacy in the Gulf. President Biden’s national security strategy focuses on supporting de-escalation and integration in the Middle East, but after years of failed nuclear negotiations, there appear few good opportunities for the United States to support efforts toward stabilizing the Gulf.[64] That said, environmental cooperation is one of those opportunities. It is economical and low risk, so it is an effective way to test Gulf states’ desire to build trust. The results of efforts to build environmental cooperation would be instructive to U.S. policymakers, as it would either reinforce or undermine their understanding of Gulf states’ regional strategies in the new environment. President Biden has also made climate action a priority. Supporting environmental initiatives in the Gulf would help one of the regions that will suffer the effects of climate change most acutely, but it would also support the United States’ political aims. As the United States is reconfiguring its role in the Middle East, a greater push for environmental cooperation would help remake its image in the region. Further, failing to engage more substantially on the environment would open up more space for China, which would undermine the ability of U.S. companies and analysts to help shape the transition to sustainability.[65]

#### Middle Eastern war is coming now and goes nuclear---only diplomacy averts extinction.

Al Makahleh ’24 [Shebab; June 28; Senior media and policy consultant in Jordan and the United Arab Emirates, he has been working for several Middle Eastern countries as a political, military and security expert; The Jordan Times, “The Middle East tinderbox: Averting specter of nuclear catastrophe,” https://jordantimes.com/opinion/shehab-al-makahleh/middle-east-tinderbox-averting-specter-nuclear-catastrophe]

In a chilling roundtable discussion attended by a diverse array of scholars, professors and experts from renowned universities, think tanks and policy institutes, the fragile state of global affairs took centre stage. With the esteemed Professor Joseph Nye of Harvard University present, the conversation gravitated towards the Middle East, a region that has the potential to ignite a catastrophic nuclear war. The geopolitical landscape is increasingly defined by the rift between Russia and China, and their alliance, on one side, and the United States and NATO, on the other. This escalating tension is exacerbated by the mutual threats and saber-rattling across various flashpoints, from the Taiwan Strait to the Ukraine conflict, and from the Korean Peninsula to the volatile Middle East. The rift between the Russia-China alliance and the US-NATO axis has intensified in recent years, with both sides engaging in a perilous game of geopolitical brinkmanship. In the Middle East, this tension manifests in the proxy conflicts and power struggles playing out, from the war in Syria to the turmoil in Libya and Yemen. These regional conflicts have become entangled with the larger strategic competition between the great powers. Russia’s intervention in Syria, for example, was seen as an attempt to bolster its influence in the region and challenge the US-led order. Similarly, China’s growing economic and diplomatic ties with countries like Iran have raised concerns about its intentions in the Middle East. The Middle East, a powder keg of political, religious and ideological divisions, stands as the most immediate and perilous threat to global stability. The delicate balance of power in this region, coupled with the proliferation of nuclear capabilities, has created a scenario where the potential for miscalculation and unintended escalation looms large. The presence of nuclear weapons in the region further heightens the risks. Israel, widely believed to possess a sizeable nuclear arsenal, has long been a source of concern for its neighbours. The ongoing tensions between Iran and the West over Tehran’s nuclear program have also raised the specter of a potential nuclear confrontation. Furthermore, the unresolved disputes between India and Pakistan, both nuclear-armed states, and the precarious situation on the Korean Peninsula, where North Korea’s nuclear ambitions pose a threat to South Korea and Japan, create a complex web of nuclear flashpoints that could ignite a larger conflagration. In this volatile environment, the potential for miscalculation and unintended escalation is extremely high. A single mistake or misjudgement by any of the involved parties could trigger a chain reaction leading to a nuclear exchange. The fragile balance of deterrence that has held for decades is now under immense strain, as the risk of miscommunication and miscalculation increases. The numbers alone are staggering. The United States, Russia and China possess the lion’s share of the world’s nuclear stockpile, with the US and Russia maintaining over 5,000 nuclear warheads each, and China’s arsenal estimated to be in the hundreds. The volatile situation on the Korean Peninsula, with North Korea’s growing nuclear capabilities, further compounds the risk, as the fragile deterrence between North and South Korea, and Japan, hangs by a thread. In this precarious geopolitical landscape, the role of leadership and diplomacy becomes paramount. The nations involved must navigate the treacherous waters of strategic ambiguity, where the slightest misstep could unleash a chain reaction leading to unthinkable devastation. The path to averting this nuclear catastrophe lies in the hands of those with the foresight, courage, and diplomatic acumen to bridge the widening chasm between the global powers. It will require a fundamental shift in mindset, from the zero-sum game of political grandstanding to the recognition that the survival of humanity is the ultimate prize. The Middle East, with its entrenched conflicts and competing interests, presents the greatest challenge in this quest for peace. Resolving longstanding disputes, addressing the root causes of regional tensions, and cultivating a culture of mutual understanding and compromise must be the guiding principles. As the world watches with bated breath, the onus falls upon the leaders of these nations to rise above their own egos and ideological differences. The specter of nuclear war, once unthinkable, now looms large, and the consequences of inaction are unimaginable. Averting this nuclear catastrophe will require a concerted effort on multiple fronts. Diplomacy and dialogue must be prioritised, with the great powers engaging in substantive negotiations to address the underlying drivers of tension. Confidence-building measures, such as the establishment of clear communication channels and the implementation of crisis management mechanisms, can help reduce the risk of escalation. Regional conflict resolution efforts must also be intensified, with the involvement of all stakeholders, including the local actors and the global powers. The resolution of longstanding disputes, such as the Israeli-Palestinian conflict and the tensions in the Persian Gulf, can help create a more stable and secure regional environment. Moreover, the strengthening of global governance institutions and the reinforcement of international norms and laws regarding the use of nuclear weapons can contribute to a more stable and predictable international order. The time for action is now. The world cannot afford to be mere spectators to the unfolding drama in the Middle East. A concerted effort, guided by reason and a shared commitment to the preservation of human civilisation, must be undertaken to extinguish the flames of conflict and chart a course towards lasting peace. Ultimately, the key to averting a nuclear catastrophe in the Middle East lies in the ability of the global community to transcend narrow self-interests and work towards the common goal of preserving humanity. The stakes are too high, and the consequences too dire, to allow the pursuit of short-term political gains to jeopardise the future of our species.