# 1AC---Dartmouth---Round 2

## 1AC

### 1AC---ADV: Experts

#### Contention 1 is Energy:

#### Trump’s flurry of executive orders is imperiling the independence of the Nuclear Regulatory Commission [NRC]. That’s destroying confidence and preventing effective implementation of Trump’s nuclear goals

Burns et al. 25 [Stephen Burns; served as a Commissioner on the United States Nuclear Regulatory Commission JD from George Washington. Alan **Ahn**; Master of Arts in Law and Diplomacy from Tufts, Director of Programs and Communication at the Global America Business Institute. Rowen **Price**; Senior Policy Advisor for Nuclear Energy. Ryan **Norman**; Senior Policy Advisor for Climate and Energy Finance, July 31 2025, "Trump is Gutting the NRC. Nuclear Deployment Will Face the Consequences.", Third Way, https://www.thirdway.org/memo/trump-is-gutting-the-nrc-nuclear-deployment-will-face-the-consequences] \*[language modified]

Dismissals of senior staff: Recent reports suggest that key NRC personnel at the senior staff level have been “effectively forced out,” in a sudden loss of technical expertise and institutional knowledge that cannot be readily replaced. Former Executive Director of Operations Mirela Gavrilas is among those who have been reportedly forced to leave the agency. There are legitimate concerns that these positions will soon be filled with political allies rather than experts. Applications for new career safety inspectors require answering the question, “How would you help advance the President's Executive Orders and policy priorities in this role?”

Appointment of DOGE staffers to key agency roles: Allegedly, a DOGE staffer was detailed to the NRC’s Office of the Executive Director for Operations, where he is now tasked with “handling reductions in force at the agency.” During his nomination hearing on June 25th, Chairman David Wright confirmed that this staffer is “on detail from the Department of Energy, and as such, does not have an NRC supervisor.” Reports have surfaced that this detailee has communicated his expectation that the agency “rubber stamp” license approvals. DOGE detailees lack technical nuclear knowledge and an understanding of the NRC’s mission, presenting an enormous risk to the credibility of the agency as the US nuclear regulator.

These events have fueled speculation that the White House is positioning itself to intervene in licensing decisions and reviews that should be firmly based on technical factors and considerations. And while there are appropriate roles for DOE and the Defense Department as part of a whole-of-government strategy on nuclear deployment, these recent actions have intensified concerns that the administration is attempting to leverage these agencies to circumvent the NRC’s proper jurisdiction as the independent regulator of civilian uses of nuclear technology. This change would be a shocking rejection of the provisions of the Energy Reorganization Act of 1974—which rightly separates the government’s promotional and regulatory functions with respect to nuclear energy to ensure the NRC’s credibility as a safety regulator. Such centralized executive power would severely undermine the NRC’s independence and authority.

Undermining Confidence in American Nuclear

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

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

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

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

Draining the Agency of Technical Expertise and Capacity

The Trump Administration set the very ambitious, and laudable, goal of expanding US nuclear energy capacity to 400 GW by 2050. Even if there are enormous staffing efficiencies that could be gained at NRC, it is inherently contradictory to slash the agency’s expert staff while dramatically increasing the number of licenses it needs to review, especially while rightly demanding it review applications much more quickly.

The demand for nuclear energy is skyrocketing, both at home and around the world. The NRC is seeing record numbers of new license applications, many for new reactor designs that have not yet been licensed in the United States. Of particular note, the President’s AI Action Plan and associated EO on Accelerating Federal Permitting of Data Center Infrastructure, published July 23, 2025, create an unprecedented demand for nuclear fission technologies to support these electricity markets. However, these licensing reviews require unique and scarce technical expertise, and demand a close and rigorous partnership between the developer and regulator. Considering this, we should be talking about sizable increases to agency staff, not reductions.

DOGE’s track record across the federal government does not inspire confidence. Workforce reorganizations and reductions conducted without sufficient precision (as we have seen from DOGE at NNSA) will debilitate [undermine] the agency at an inflection point for US industry. And DOGE influence, in and of itself, has incentivized flight at other agencies, such as DOE.

There is enormous urgency to quickly approve the US’s first commercial advanced nuclear new builds and scale the deployment of these technologies. The NRC must have the means to meet the moment—this means adding to existing technical expertise, increasing funding, and uplifting the authority of the Commissioners as the decision-makers for their own agency.

Broader Consequences of Trump’s Actions on NRC

Potential Delays and Disruptions at a Critical Juncture for US Advanced Nuclear

DOGE influence and presence—beyond the fundamental issue of undermining the agency’s technical credibility and objectivity—threaten to put the NRC at a breaking point through the loss of key personnel and leadership in combination with the specter of systematic workforce reductions and “wholesale revisions” to regulations.

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

Creating Negative International Ripple Effects

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

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

Ironically, efforts to weaken the NRC’s credibility are also inconsistent with the administration’s goals to expand US nuclear exports as outlined in a separate EO on deploying advanced nuclear for national security. Moreover, diminished agency capacity would hamper the NRC’s ability to support and provide regulatory assistance to countries interested in US reactor technologies, further negatively affecting our international competitiveness. And by weakening our export competitiveness in the name of reform, we will cede international markets to China and other competitors—with adverse implications not only for the global reputation of our nuclear regulator, but also American industry and our security and geopolitical interests.

#### Only expert implementation unlocks Trump’s nuclear agenda, solving climate change

Toro 25 [Quico Toro; Masters in Social Policy and Planning from London School of Economics and Political Science. Director of the Anthropocene Institute, IR from John Hopkins School of Advanced International Studies (SAIS), 1-24-2025, "Putting the Worst Green Ideas in the Dustbin of History", Persuasion, https://www.persuasion.community/p/putting-the-worst-green-ideas-in] \*[language modified]

Whether Donald Trump actually believes climate change is a Chinese hoax, or whether he just says it to get under his opponents’ skin, we don’t know. What we do know is that he drips with contempt for environmentalism and those who espouse it. So it surprised no one that, amid the rash of Week One executive orders, many of them—ranging from pardoning January 6 Capitol rioters to overturning birthright citizenship by executive fiat—deeply irresponsible, he made sure to do his utmost to piss off the greens. The executive order titled “Unleashing American Energy” seems built entirely around the maxim that whatever progressive climate activists support must be bad. Environmentalists were suitably appalled, which figures: appalling them seemed to be the whole point.

This seems like a simple story of a callous administration gleefully wrecking the environment to line the pockets of its backers in the fossil fuel industry. And there’s certainly some of that. But it’s not so simple. The green consensus overturned by Trump’s executive order was badly built around a series of half-baked ideas that create serious problems when you try to implement them. Trump has no idea, but in killing their worst ideas, he’s just done the climate movement a big favor.

For a decade, mainstream environmentalism has been organized around a simple formula: electrify everything, then switch electric generation to renewable sources, especially wind and solar. This was the guiding spirit of Biden’s landmark climate law, the misnamed Inflation Reduction Act (IRA), which Trump is especially keen to dismantle. The IRA’s central plank was a series of juicy tax incentives to subsidize wind and solar production, setting off a boom in generation capacity that was supposed to revolutionize American energy markets.

Pushed with great enthusiasm by activists who didn’t really understand the nuts and bolts of energy markets, the rush towards weather-dependent renewables carried risks that are only now being recognized. Intermittency—renewables’ propensity to flake out when the weather isn’t cooperating—turned out to create complications the climate movement hadn’t properly thought through. For all the hype, hydrogen and grid-scale batteries are far from being ready to take up the slack. Renewable-heavy grids, it turned out, only work if backed up by hugely expensive back-up power sources, usually reliant on fossil fuels. Wherever regulators pushed up the share of renewables in the grid, prices rose, price volatility rose, and grids became more fragile.

This was foreseeable, and ought to have been foreseen. But ideology is a hell of a drug, so the unthinking push towards unstable, unaffordable energy picked up steam around the world. The places that have gone farthest in this direction have ended up with some of the world’s highest and most volatile energy prices. Energy intensive manufacturing has begun to flee these places, which figures: who wants to run a factory where the cost of energy depends on the weather forecast?

It’s still taboo to say this frankly in right-thinking spaces, but it’s becoming obvious that the green consensus was badly misconceived from the start. The more weather-dependent renewables you add to the grid, the more volatile and unreliable it becomes. Pushed far enough, this trend portends a crisis. High and volatile prices aren’t even the worst of it: Industry watchdogs in the United States have been warning for some time that switching from old fossil fuel plants to renewables leaves the Midwest and the Northeast at risk of blackouts.

The rush towards a weather-depending grid threatens to make climate politics synonymous with winter blackouts and economic doldrums. Which is why a small but growing dissident movement within the climate community—sometimes called “energy realists”— increasingly argues that energy abundance is absolutely non-negotiable in the fight against climate change: voters won’t stand for climate policies that pick their pockets and leave them in the dark in the middle of winter. Nor should they.

This is pretty much my view. We energy realists tend to think there’s only one way to square energy abundance with zero emissions: nuclear power. The case for nuclear is simple: it’s the only technology that can get us to zero emissions safely and affordably.

For energy realists, Trump’s executive order isn’t the unmitigated disaster greens see. We see problems, for sure. We also see—dare we say it?—some promise.

The orders include a sweeping mandate to all federal agencies to “suspend, revise, or rescind all agency actions identified as unduly burdensome” to the development of domestic energy resources. Though the order is obviously built around the priorities of the fossil fuel industry, it explicitly includes nuclear resources.

More importantly, it instructs agencies to simplify permitting across the energy industry, by easing requirements under the National Environmental Policy Act—better known as NEPA. This Nixon-era law had grown over the years into a NIMBY’s best friend, creating a labyrinthine permitting process that made it absurdly easy for anti-development groups to tie up any project they didn’t like in legal fights that could last years, even decades. NEPA is one of the biggest reasons it’s gotten so hard to build projects of any level of ambition in the United States, and is a key reason why so few new nuclear power plants get built.

If you squint, there is an optimistic case to be made for Trump’s early executive orders on climate grounds. They don’t know it, but Trump is doing the greens a big favor by forcibly removing the shovel they were using to dig themselves deeper and deeper with regard to wind and solar. Allowed to run for another four years, America’s wind and solar buildout would’ve brought the country to the kind of energy crisis that would have turned environmentalism into a toxic brand for a generation. Now, that’s unlikely to happen.

Instead, by including nuclear in his all-of-the-above energy abundance agenda, Trump could give [an advantage] a leg up to the one zero-emissions technology that actually could bring lasting, politically attractive and economically sustainable decarbonization.

Most people don’t understand this yet, but the next generation of advanced nuclear reactors now wending their way through the world’s research labs are an order of magnitude better than the previous generation. None of them have reached the point of commercial development, but once they do, there’s a very real chance they’ll crowd out fossil fuel generation within a few decades, simply because they’re better in every way: cleaner, cheaper, healthier and much safer. If his administration gets serious about licensing fourth generation nuclear power plant designs, Trump could—paradoxically—be remembered for sounding the death-knell of the fossil fuel economy.

Of course, he’s not doing this because he cares about the environment—he plainly doesn’t. But politicians end up with legacies at odds with their intentions all the time. Take Richard Nixon: making it impossible to build anything important in America was obviously not what he hoped to be remembered for, but by signing NEPA, that’s the legacy he earned.

#### Global warming ensures multiple pathways to extinction through non-linear feedback loops

Spangenberg 25 [Joachim H. Spangenberg Professor at University of Versailles St. Quentin, Research Coordinator at the Sustainable Europe Research Institute, member of the Executive Committee of the International Network of Engineers and Scientists for Global Responsibility, PhD in Economics. Citing, among others: Chi Xu, Professor of Ecology at Nanjing University; Timothy A. Kohler, Professor of Anthropology at Washington State University, Fellow at the Research Institute for Humanity and Nature; Tim Lenton, Professor of Earth Science at University of Exeter, PhD, University of East Anglia; Jens-Christian Svenning, Professor in the Department of Bioscience at Aarhus University; Marten Scheffer, Professor at Wageningen University; Nicole D. Miranda, Professor of Engineering Science at the University of Oxford; Jesus Lizana, Associate Professor in Engineering Science at the University of Oxford; Sarah Sparrow, Associate Professor in Environmental Impact, University of Oxford; Miriam Zachau-Walker, PhD Candidate in Engineering Science; Peter A.G. Watson, PhD, Senior Lecturer at School of Geographical Sciences at Bristol University; David C.H. Wallom, Professor in Informatics at Oxford; Radhika Khosla, PhD, Associate Professor at the School of Geography and the Environment at Oxford; Malcolm McCulloch, PhD, Professor of Engineering at Oxford, “The roadmap to collapse: whatever the last summers have been like for you, one thing is clear: you are currently experiencing the coolest period of your lives,” Consumption and Society Journal, Vol. 4, No. 1, pp. 141-55, 2025]

Science

The effects of such a strong warming are still insufficiently researched – some scientists speak of the ‘climate endgame’ (Kemp et al, 2022). Climate researchers have constantly underestimated both the extent and the speed of change, and economists, who have long played down climate change, still massively misperceive science (economics is a scholastic system, not a science: Diesendorf et al, 2024), underestimate the social costs of the climate crisis, and thus misadvise policy (Rennert et al, 2022).

2030

Economy and Politics

The war in Ukraine has ended with a compromise, Russia keeping Crimea, but the Near East conflict is close to a nuclear confrontation. The United States has withdrawn support from Ukraine, leaving the multi-billion job to rebuild the country to Europe; no comparable efforts are undertaken in Palestine. The significant weaponry production facilities built up during the war in Ukraine continue producing, flooding the world with exports from Europe, Russia and the United States, and fuelling military conflicts around the world. The international order, international regulations and norms are eroding. Throughout the world economy, resource constraints are felt – this is a major challenge to the EU refining economy model (importing cheap resources at low cost, exporting sophisticated products at high ones). With these effects on top of the decades-old trend of secular stagnation, economic growth has come to a standstill. To secure resource access and trade, the major powers (United States, China, Russia and their satellites) increasingly use military means.

The electrification of all spheres of life continues, following US standards for the West, and Chinese ones for the rest of the world. Artificial intelligence and Large Language Models made the share of global greenhouse gas emissions double from about 4 per cent of the global total – an unbroken trend driven by demand and supply. Governments invest heavily in subsidising technical solutions to still not declining CO2 emissions like carbon capture and storage (CCS – capturing CO2 from production processes, purifying and compressing it, transporting it to on-shore and off-shore underground dumping sites and storing it there). However, the volumes stored remain marginal, and the process is expensive and increases overall energy consumption. The new ‘hydrogen ready’ natural gas fired power stations built in the first half of the decade continue running on fossil fuels as the limited amount of ‘green hydrogen’ available is used for production processes. Hence, even if some of them are converted to hydrogen, the hydrogen they use is generated from natural gas. So while gasoline use is decreasing, natural gas consumption increases steeply.

Consumers are still unwilling to change habits – solar energy production in households has been growing significantly as it saves costs, but overall energy consumption is still increasing. Reduction of heat demand falls short of what is needed to limit the climate crisis, sustainable mobility including less car use, and even the market share of electric vehicles, is only growing slowly – bans on fossil fuel cars have been abandoned under the pressure of public opinion and conservative parties. Sufficiency is still anathema, even more so as expectations of rising incomes are being disappointed. After a short phase of war Keynesianism (growth through military investment), economic growth is further slowing down due to higher resource and energy costs, insecure supply chains, re-shoring (relocating industries back into the national economy – a kind of insurance against supply risks, associated with less division of tasks and higher cost).

Society

Social inequality is increasing, as the richer strata of society are better able to protect themselves from climate impacts than the poorer, but this is accepted after decades of neoliberal education – social consideration is dwindling, self-fulfilment at the expense of others is on the rise (Benz, 2022), the brutalisation of elites has taken hold of the middle classes (Heitmeyer, 2012). The crisis of care, remunerated and voluntary, is accelerating (Spangenberg and Lorek, 2022). As in the past after floods, droughts, cyclones and heat waves, violence against women and members of gender minorities is on the rise – mental stress, drug abuse, economic problems, food insecurity and poor social infrastructure after climate disasters are the immediate triggers (Rodrigues, 2022).

The readiness to employ violence in all kinds of conflicts, or just for the fun of it, continues to increase – police, fire brigades and ambulances are attacked, as are local politicians. As frightened people withdraw from such engagement, public security and democracy are suffering, and extremism is on the rise. Together with the increasing income polarisation, this leads to emerging unrest, intensifying social tensions exploited by the far right/neo-fascists; and populist parties win majorities.

Climate

The global temperature rise has surpassed 1.5°C and is on its way to 2° to 3°C (Carrington, 2022). The causes are manifold – besides the lack of political will and sufficient funding, and institutional feasibility constraints, the conversion of many economic sectors is failing due to a lack of skilled workers, especially in handicraft professions. Second, physical resources are lacking, not only because of unreliable supply chains, but also because minerals and metals are not available in sufficient quantities – past expansion plans have systematically ignored the finite nature of resources. Given the lack of resources, competition of decarbonisation strategies with digital applications and armament is leading to a price explosion that is slowing down the expansion of renewable energies. NATO members have increased their military spending to 2 per cent of their GDP, causing annual additional emissions larger than those of Russia, the world’s largest natural gas producer. Accelerated clean energy production reduces the energy cost, but contributes little to reducing the overall emissions.

Due to insufficient decarbonisation, lack of conservation of materials and energy, and the influence of the fossil fuel industry, greenhouse gas emissions remain too high. For example, since 2022, the 12 largest oil and gas companies alone have spent €103 million per day on the development and exploitation of new oil and gas fields (Carrington, 2021). Correspondingly, emissions have increased by 14 per cent since 2020 instead of falling by 50 per cent as required (McKie, 2022). Governments did nothing to prevent oil and gas multinationals from embarking on these projects, which clearly made compliance with the 1.5° limit impossible (Carrington and Taylor, 2022).

As a result of higher evaporation, summer drought is the new normal in Europe, including heat waves and large-scale forest fires (up 40 per cent in the Mediterranean). The number of heat days has doubled compared to 1971–81 and the number of frost days has dropped significantly. At the same time, there are extreme cold spells (persistent low temperatures of up to minus 20°C in Central Europe and massive snowfalls in the Mediterranean) due to polar air intrusions, caused by the weakening of the circumpolar jet stream. The ongoing Amazon dieback has turned wider parts of the basin from carbon sinks into carbon emission sources, further accelerating climate change.

Although heavy rainfall on land has increased by 16 per cent in Europe, and massive investments in flood protection are required, more than 270 million people suffer from water shortages, and in some regions water has to be rationed regularly. Water-intensive agricultural crops are being cut back, ploughing is becoming problematic. Harvests are at risk due to the mix of heat, drought, heavy rain and frost periods, while varieties genetically optimised for one environmental condition fail under the other conditions. In particular, winter cereals, depending on a prolonged period of low temperatures before they can shoot and flower (vernalisation), produce significantly reduced yields.

The collapse of the Greenland ice sheet is accelerating, but it is not yet clear by when it will have melted completely, raising global sea levels by seven metres. Decision-makers are hoping for the long term and postponing protective measures for coastal regions that go beyond incremental dike increases. The tipping points of the climate, first exceeded in the early 2020s, are becoming a cascade (Armstrong McKay et al, 2022). Migration and immigration of species result in communities that have never existed in the past 10,000 years, altering the spectrum of ecosystem services provided. The restoration of ecosystems and their services proves to be impossible.

Health

In particular in ageing societies, health costs are spiralling out of control (in European public health systems less than in the United States). The problem is aggravated by the additional challenges caused by environmental degradation, like more frequent pandemics, new infectious diseases and the curbs on medical research introduced to minimise the risk of terrorists using bio-medical know-how to produce and disseminate bioweapons (Brent et al, 2024).

The areas suitable for malaria transmission have grown by 10 per cent and more where re-wetting of wetlands was implemented. Disease vectors such as the tiger mosquito are forming stable local populations in formerly temperate climate zones, ticks continue to spread, and known tropical pathogens are spreading at an increasing rate (Mora et al, 2022). It is not possible to prevent the new waves of infection through precautionary measures due to the multitude of mechanisms of action.

2040

Economy

The obstacles to growth already manifest in 2030 have been growing, and new ones have emerged, for individual countries (mostly the heavily export-dependent ones like China and Germany), and for the world economy as a whole. Already 15 years ago, economic research estimated that an increase in global temperature of 1°C would lead to a 12 per cent decline in global GDP (Bilal and Känzig, 2024), and the ‘locked in’ global economic damage caused by global warming up to the year 2050 was estimated to be almost US$60,000 billion, corresponding to 30 per cent of the global economy (Kotz et al, 2024) – now the bill has to be paid. Add to this the expenditure on coastal protection, relocation of dykes and partial abandonment of cities and settlements due to the faster than expected rise in sea levels now and in the next decades (Taberna, 2022), what we have been facing since 2030 is just the beginning of a long-term, climate change-induced recession of the entire global economy (Kotz et al, 2024).

Hence, after years of stagnation, economic growth has turned negative. The economic reason is that to generate growth, the annual investment must be higher than what is needed to compensate for loss to wear and tear, and the requirements of technological development – otherwise the production potential does not increase. Investments are financed from the surplus of the previous year, plus by credit. The latter is limited in the private sector by the risk of over-indebtedness, and in the public sector by the necessity to keep redemption below a level impinging on key policy priorities, and to limit the regressive effects of taxpayers financing the interest for rich lenders. Hence the necessary massive defensive investments in climate adaptation, the repair of environmental damages, protection of biodiversity (not least for food security) and cleaning the environment from health-threatening pollution with particulate matter, microplastics and the like – economically necessary to avoid future losses – begin crowding out investments in expanding the production potential. The increased spending on CCS and hydrogen processes and infrastructures, armaments, and business subsidies for climate neutral production (state subsidies cover a significant share of the European chemical industry’s 2021–50 decarbonisation funding gap of US$550 billion [Scott, 2024]), and so on, exacerbates the situation. Furthermore, the health systems are at the brink of collapse due to heat-induced treatment needs, and with them the stability of an ageing society (Romanello et al, 2021). Such investments are classified as ‘defensive’, as they prevent damages accumulating, but are not (or only to a certain part) enhancing the production potential. Subsidies are claimed as for the business sector, defensive investment needs are mostly the result of mandatory legal obligations. Innovation, dematerialization and digitalization suffer, in particular as decarbonization, digitalization and weapons production are competing for the same or similar physical resources. As defensive investments are crowding out business production capacity enhancing investments, the production potential is shrinking, and GDP declines. For some time, public authorities have tried to compensate such investment capital scarcity with public funding, but the required level is surpassing all estimates of public fund availability. The necessary level of government spending begins to lead to a higher tax burden on corporate profits and to declining real incomes, public disapproval and social unrest.

Consumption

Consumption, which has been the main driver of ecological burdens since the turn of the millennium, is declining – the consumer society is running out of consumers (Spangenberg and Kurz, 2023). However, this externally enforced reduction in consumption leads an ever fiercer defence of privileges, less willingness to voluntarily reduce consumption, or to share the remaining wealth with others, in particular with the Global South. Hence, public pressure results in an end to development cooperation and (the always insufficient) financial support for climate adaptation to poor countries. The result is more climate refugees, clashing with a decreasing willingness to welcome any kind of migrants as they are – wrongly – perceived as competitors for the diminishing consumption space. Consumer dissatisfaction spills over into increasing scepticism regarding the liberal democratic system – an institutional crisis is emerging (Kalke et al, 2024).

Politics

The global political situation has become volatile, with a group of major powers struggling for dominance, while the majority of countries tries to navigate the stormy waters in changing collaborations and confrontations. Trade wars and patent conflicts prevail; international regimes of intellectual property rights have collapsed and free trade in resources has come to a virtual standstill. Armed conflicts are fueled by geopolitics and upscaled by weapons export since 2025, resource wars increase, but in order to avoid nuclear escalation, the major powers impose an allocation system for raw materials, with quotas for all countries (which many consider a neocolonial means to deny access to non-affiliate countries). There are political and armed conflicts about access to increasingly short freshwater supplies. The global water crisis takes its toll, hunger is getting normalized in many parts of the world, due to declining harvests due to heat stress and lack of irrigation water.

Public pressure demands a ‘Fortress’ policy, denying climate refugees access to the still relatively affluent countries – a demand the strong extreme right is more than happy to fulfil (nativism, economic fears, and so on). Permanent involvement in resource wars and repulsion fights against refugees at all borders leads to a militarizing of societies, but also to a more favorable view on elements of a war economy. This, together with the shortage of physical resources, has drastic political consequences.

Domestically, in most European countries and beyond, politicians have pulled the emergency brake and declared both a ‘climate war’ (mostly neglecting other environmental problems) and ‘identity defense’ (rejection not only of refugees, but all ‘foreign’ inhabitants – at the expense of lacking skills and workers in the labor force). As the permanent resource constraints and the high cost of enforcing access make it impossible to any longer ignore the problem of overconsumption, decisionmakers try to find ways to accommodate the internationally set resource quota. The limited materials are auctioned off nationally, with special purchase rights for non-commercial users. This mechanism, borrowed from war economics, leads to a massive restructuring of industry, as high resource efficiency becomes a prerequisite for a secured further existence. In order to limit overconsumption, those consumer goods that have become scarce are given away on non-tradable ration coupons. This ensures that scarce goods are available to all and are not consumed or hoarded by a privileged few at the expense of the general public.

2050

Rising temperature, rising sea levels, rising migration

The emergency measures introduced in 2040 have managed to prevent or at least postpone the collapse otherwise due. Nevertheless, global warming surpasses 2.5°C (that is, 5°C over land), triggered by tipping cascades such as the melting of permafrost regions since 2040, when the conditions for their permanent existence were no longer given, transforming large parts of Siberia, Alaska and northern Canada into barely usable, greenhouse gas emitting swamps (IPCC, 2021; Fewster et al, 2022) plagued by wildfires. Wetlands and moors are drying out – and thus releasing additional CO2. Deadly heat waves and temperatures of over 50°C are no longer uncommon in the tropics, and temperate latitudes exceed 40°C in summer, causing tens of thousands of heat deaths annually in Europe. In many regions in the South, but also in European regions such as the Spanish highlands, human life is no longer possible.

Anthropogenic warming is casting billions of people outside of the boundaries of normal human habitation, with abundant negative consequences for human wellbeing, mortality and levels of international migration (Scheffer et al, 2024). A billion people are facing coastal flooding risk from rising seas, and more people are forced out of their homes by weather disasters, in particular flooding, sea level rise and tropical cyclones (Selby et al, 2024). Once warming exceeds a few more tenths of a degree, it will lead to large areas becoming uninhabitable (IPCC, 2022).

While most refugees stay in neighbouring countries until their capacities are exhausted, many move to the North, only temporarily stopped at the crumbling military border defence of the EU (less so, and later, the United States). Migration is enhanced by the neocolonial economic policy of the dominant powers, with militarily supported land-grabbing where fertile ground and water are available (for example, Ukraine) to overcome domestic food supply volatility problems.

Freshwater scarcity

Heavy rainfall on land has increased by more than a third; summer precipitation comes in the form of flash floods, which only partly seep into the ground and replenish the groundwater available for dry periods. Freshwater has become scarce and is part of the rationing system. Private swimming pools, watering lawns or washing private cars have been banned. Not least because of the melting of the last glaciers in the Alps and the Andes/Rocky Mountains, river levels fluctuate extremely, affecting both shipping and summer water supplies. More than 390 million people are suffering from water scarcity, and their number is bound to rise. The thawing of the Himalayan glaciers accelerates (they had lost 40 per cent of their area by 2020 [Lee et al, 2021]), putting the regular water supply of two billion people at risk, who depend on the waters of Indus, Ganges, Brahmaputra, Irrawaddy, Mekong and Yangtzekiang (Wester et al, 2019).

Sea levels are rising faster than expected and are approaching one metre. Salt water penetrates the groundwater reservoirs in coastal regions and all major river deltas, putting some of the ‘bread baskets’ of the world at risk (for example, in Egypt, Vietnam, India, Bangladesh, Argentina, the United States). The tidal flats and salt marshes along the North Sea and similar coastal regions are under pressure – where dikes are not moved back, sacrificing land to the sea and allowing salt marshes to move inland, they are flooded and some of the most biologically diverse habitats on earth are thus lost (Saintilan et al, 2022). The oceans are not only becoming warmer and hence low-oxygen, but also more acidic, affecting countless species along the entire food chain. Shell-forming animal species are dying out, fish stocks – until 2040 a major protein source of humankind – have more or less collapsed due to past overfishing, persistent ocean pollution, acidification and the loss of breeding grounds (temperate salt marshes decline, coral reefs are gone). Habitat for nearly 20 per cent of all insect species has at least halved.

Food (in)security

The cultivation of wheat, barley, rye, oats and maize is hardly possible anymore (wheat becomes sterile at 30°C, maize pollen at 35°C); agriculture has switched to millet/sorghum and chickpeas instead of wheat, yams instead of potatoes, as well as cassava/ manioc and sweet potatoes. Small farmers have not survived the crisis economically. In addition, higher CO2 concentrations reduce the quality of proteins in cereals and fruits, and cows have to digest more grass for the same milk yield.

The number of frost days has decreased sharply, in many years they no longer occur – a problem for food production from fruit trees, vegetables and wheat. To these plants, prolonged cold exposure is required to provide competency to flower (vernalisation). In other years, non-moving polar air masses lead to weeks of deep low temperatures, which do not suit many of the new, drought-resistant agricultural plants. These are hot–cold times. Vegetation also feels the effects: native tree species are not adapted to heat and drought, but Mediterranean species are not adapted to the cold spells. As a result, more than half of Europe’s tree species are threatened with extinction. Forest fires accelerate that – burning areas in the Mediterranean region have grown by more than 60 per cent.

Health

Areas suitable for malaria transmission have grown by 15 per cent. Tropical disease vectors are well established, but tropical and emerging pathogens are spreading mainly through transmission by indigenous species; dengue, chika and West Nile fever are regular occurrences. New pathogens have emerged from zoonoses, pandemics with previously unknown pathogens regularly claim numerous victims worldwide – the ‘age of pandemics’, of which IPBES had warned urgently, has dawned (IPBES, 2020).

Alternative scenario for Europe (other regions unaffected)

Following the calculations of Ditlevsen and Ditlevsen (2023), the AMOC/Gulf Stream warm water circulation would collapse between 2025 and 2095 with a central estimate of 2050 (assuming emissions are not reduced, in line with our earlier assumptions). Such a collapse would result in Western Europe suffering far more extreme winters, rapidly rising sea levels on the east coast of the United States and a lack of vital tropical rainfall. During the last ice age, some major changes in AMOC flow caused winter temperatures to change by 5–10°C in just one to three years. The chilling effect would be moderated by the heating that has already occurred in the northern hemisphere (Spangenberg et al, 2012).

2070

A dystopian situation has emerged: planetary boundaries continue to be crossed, tipping cascades cause irreversible damage and have escaped human control, ecosystem cycles are collapsing. The loss of pollinators reduces food availability; fermented substitutes are consumed instead. Desperate attempts at geoengineering have not solved any problem, but created new damages and conflicts. The global heating has surpassed +2.5°C and is heading for 3°C – which implies 5–6°C heating over land (IPCC, 2021). All coral reefs and almost all large tropical forests have disappeared. The melting of the Greenland ice sheet, the increasing loss of South Polar ice and of almost all glaciers is driving up sea levels. Coastal cities around the world are being abandoned, partly because of direct flooding and ever stronger typhoons, partly because infrastructures cannot withstand rising sea levels despite high dikes. Life expectancy is decreasing, and water and food supply has become unreliable, even in the richest parts of the world.

For two billion people, survival in their homeland is no longer possible – flight or death is the alternative as a result of heat, drought, lost soil fertility or as a result of flooding and salinisation. As neighbouring countries and regions can no longer absorb the refugees – they are already overburdened and suffer just as much from climate and environmental destruction – a global migration of more than one billion of people has set in, upsetting all previous geopolitical power constellations. Countries are at permanent war to uphold the neocolonial status quo, but the threat of nuclear escalation is growing by the day. The mood of migrants is not only desperate, but also aggressive: those affected are well aware that they are innocent victims of the North’s overconsumption. Already in 2020, the richest 10 per cent of humanity (that is, all those with an annual income of over US$90,000) emitted almost half of all CO2 emissions, while the poorer half of the world’s population was only responsible for 12 per cent (Herrmann, 2022). Such facts have been sinking into the collective consciousness and attitudes. The Global North has been stealing the future as well as the present, not only from its own children but, above all, from those who live in the most affected parts of the world. The EU and the United States are losing their defensive wars against migrants, and their militarised societies fail to adapt to the inflow of refugees. The result of the conflict is unpredictable, but will certainly be paid for with high human sacrifices.

In temperate latitudes, landscapes are dotted with wind turbines and solar panels; there are also a few trees, but only a few species that have adapted to climate change and water scarcity. Lush greenery, buzzing insects, singing birds – absent. The planet has become silent – 90 years after Rachel Carson’s Silent Spring.

#### Independently, a biased NRC increases risks of nuclear accidents

Huff et al. 25 [Katy Huff; former Department of Energy assistant secretary for nuclear energy and is currently an associate professor at the University of Illinois in Urbana-Champaign. PhD in Nuclear Engineering, Paul **Wilson**; Grainger Professor of Nuclear Engineering and the chair of the University of Wisconsin–Madison’s department of nuclear engineering and engineering physics, Michael **Corradini**; former member of the U.S. Advisory Committee on Reactor Safeguards, a former president of the American Nuclear Society and a professor emeritus at the University of Wisconsin–Madison., 3-6-2025, "Killing a Nuclear Watchdog’s Independence Threatens Disaster", Scientific American, https://www.scientificamerican.com/article/killing-a-nuclear-watchdogs-independence-threatens-disaster/]

A Trump administration executive order is setting the U.S. on the fastest path to a nuclear accident.

Announced on February 18, the “Ensuring Accountability for All Agencies” executive order aims to bring independent regulatory agencies under the “supervision and control” of the president. Among them, the Nuclear Regulatory Commission is the watchdog that Americans rely on to hold nuclear energy companies accountable for avoiding reactor accidents and releases of radioactive material into the environment.

By demanding that the NRC cease to issue regulations and guidance without written permission from the president or the attorney general, the order effectively demands that nuclear safety take a back seat to politics.

As nuclear engineers, as well as former government and industry officials, we foresee that this proposed regulatory capture by the Executive Office of the President—where decisions are made for political reasons and not for the benefit of people served—will severely increase the risk of expensive, unexpected nuclear accidents in the U.S.

This is neither hypothetical nor hyperbole.

History provides too much frightening evidence to ignore. When Soviet leadership and its captured regulator prioritized national pride over safety, a known flaw in nuclear reactor control rods (which slow the rate of atomic fission in a reactor) went unchecked, safety protocols at the Chernobyl Nuclear Power Plant went unheeded, and in 1986 the worst nuclear power accident in history resulted.

So too when “regulation was entrusted to the same government bureaucracy responsible for its promotion,” the operators of Japan’s Fukushima Daiichi Nuclear Power Plant failed to deploy countermeasures demanded by known seismic risks; they failed to plan appropriately for evacuation; and in 2011, they failed to avoid the second worst nuclear power accident in human history.

In 1974 Congress recognized the importance of independent nuclear oversight, reorganizing the Atomic Energy Commission into two distinct agencies: the Department of Energy, responsible for research, development and promotion of nuclear energy; and the NRC, to regulate and oversee the then-booming nuclear energy industry. Five NRC commissioners, each appointed by the president and confirmed by the Senate, work together to “formulate policies and regulations governing nuclear reactor and materials safety, issue orders to licensees, and adjudicate legal matters brought before [them].” The president has the authority to designate one of these commissioners as the chair, acting as the chief executive officer of the agency.

International consensus is clear about what works and what doesn’t in nuclear safety regulation. Most fundamentally, the regulator’s ability to ensure safe nuclear power operation requires independence, especially from entities with a conflict of interest. The International Atomic Energy Agency, humanity’s foremost authority on nuclear energy safety and security, is clear that governments must ensure that the regulatory body is not influenced by “entities having responsibilities or interests that could unduly influence its decision making.” Failure to maintain regulatory independence from commercial, political and ideological influence is not accountability. It is instead regulatory capture.

Both President Trump and Secretary of Energy Chris Wright, by virtue of their offices, have responsibilities and interests that demand efforts to expand nuclear power. The country’s continued prosperity relies heavily on secure access to reliable energy, and nuclear energy has a unique role in meeting our energy demands. Nuclear energy is one of the nine pillars of Wright’s secretarial order calling for action to “unleash American Energy.” In a recent CNBC interview, when describing his optimism for growth in nuclear energy, Wright recently declared, “Do we need some government out of the way to make it work economically? Absolutely, but that’s what America is about.”

That’s true only if industrial accidents are also what America is about. In reality an independent regulator plays a fundamental role in generating public confidence in the safe and secure deployment of nuclear technology. While discussions about the effectiveness of the agency are appropriate, such discussions never question the importance of its continued independence. Even for officials in the Office of Nuclear Energy at DOE, the independence of the NRC is a red line no one would ever consider crossing, precisely because DOE’s role involves the enthusiastic promotion of nuclear energy.

Nuclear energy relies on precision technology and an unwavering dedication to safety, so regulating it is a serious technical undertaking meant to shield us from unwanted radiological consequences. The U.S. has historically been a global leader in nuclear regulatory practices and principles that uphold the highest standards of safety globally. A critical component of their operation is independence from conflicting motives. Nuclear safety is too important to undermine through uninformed political actions. Regulatory capture by industry, politics or the whims of an individual is not merely dangerous—it is the primary cause of the two worst nuclear reactor accidents the world has known. We cannot allow this to occur in the U.S.

The NRC must remain independent to provide the public confidence in the safe implementation of this important technology.

#### Nuclear fires ensure extinction from direct radiation and killing underly ecosystems

Mousseau 16 [Dr. Timothy A. Mousseau, Professor of Biological Sciences, University of South Carolina. Professor Mousseau’s past experience includes having served on the editorial boards for several journals, and on NSF, USGS, and a variety of international grant foundation advisory panels. He served on the National Academy of Sciences panel to analyze cancer risks in populations near nuclear facilities. He was elected a fellow of the American Association for the Advancement of Science (AAAS) in 2008, a Fellow National of the Explorers Club in 2009, and is a fellow of the Royal Geographical Society. He was awarded a fellowship from the American Council of Learned Societies (ACLS) in 2015 to study the history of the Chernobyl disaster. Since 1999, Professor Mousseau and his collaborators have explored the ecological and evolutionary consequences of the radioactive contaminants affecting populations of birds, mammals, insects and people inhabiting the Chernobyl region of Ukraine, and more recently, in Fukushima Prefecture, Japan. Their research suggests that many species of plants and animals experience direct toxicity and increased mutational loads as a result of exposure to radionuclides stemming from the Chernobyl and Fukushima disasters. In many species (e.g. the barn swallow, Hirundo rustica), data suggests that this mutational load has had dramatic consequences for development, reproduction and survival, and the effects observed at individual and population levels are having large impacts on the biological communities of these regions. – “At Chernobyl and Fukushima, radioactivity has seriously harmed wildlife” – The Conversation - Published: April 25, 2016 – Modified for language that may offend - https://theconversation.com/at-chernobyl-and-fukushima-radioactivity-has-seriously-harmed-wildlife-57030]

The largest nuclear disaster in history occurred over 30 years ago at the Chernobyl Nuclear Power Plant in what was then the Soviet Union. The meltdown, explosions and nuclear fire that burned for 10 days injected enormous quantities of radioactivity into the atmosphere and contaminated vast areas of Europe and Eurasia. The International Atomic Energy Agency estimates that Chernobyl released 400 times more radioactivity into the atmosphere than the bomb dropped on Hiroshima in 1945.

Radioactive cesium from Chernobyl can still be detected in some food products today. And in parts of central, eastern and northern Europe many animals, plants and mushrooms still contain so much radioactivity that they are unsafe for human consumption.

The first atomic bomb exploded at Alamogordo, New Mexico more than 70 years ago. Since then, more than 2,000 atomic bombs have been tested, injecting radioactive materials into the atmosphere. And over 200 small and large accidents have occurred at nuclear facilities. But experts and advocacy groups are still fiercely debating the health and environmental consequences of radioactivity.

However, in the past decade population biologists have made considerable progress in documenting how radioactivity affects plants, animals and microbes. My colleagues and I have analyzed these impacts at Chernobyl, Fukushima and naturally radioactive regions of the planet.

Our studies provide new fundamental insights about consequences of chronic, multigenerational exposure to low-dose ionizing radiation. Most importantly, we have found that individual organisms are injured by radiation in a variety of ways. The cumulative effects of these injuries result in lower population sizes and reduced biodiversity in high-radiation areas.

Broad impacts at Chernobyl

Radiation exposure has caused genetic damage and increased mutation rates in many organisms in the Chernobyl region. So far, we have found little convincing evidence that many organisms there are evolving to become more resistant to radiation.

Organisms’ evolutionary history may play a large role in determining how vulnerable they are to radiation. In our studies, species that have historically shown high mutation rates, such as the barn swallow (Hirundo rustica), the icterine warbler (Hippolais icterina) and the Eurasian blackcap (Sylvia atricapilla), are among the most likely to show population declines in Chernobyl. Our hypothesis is that species differ in their ability to repair DNA, and this affects both DNA substitution rates and susceptibility to radiation from Chernobyl.

Much like human survivors of the Hiroshima and Nagasaki atomic bombs, birds and mammals at Chernobyl have cataracts in their eyes and smaller brains. These are direct consequences of exposure to ionizing radiation in air, water and food. Like some cancer patients undergoing radiation therapy, many of the birds have malformed sperm. In the most radioactive areas, up to 40 percent of male birds are completely sterile, with no sperm or just a few dead sperm in their reproductive tracts during the breeding season.

Tumors, presumably cancerous, are obvious on some birds in high-radiation areas. So are developmental abnormalities in some plants and insects.

Given overwhelming evidence of genetic damage and injury to individuals, it is not surprising that populations of many organisms in highly contaminated areas have shrunk. In Chernobyl, all major groups of animals that we surveyed were less abundant in more radioactive areas. This includes birds, butterflies, dragonflies, bees, grasshoppers, spiders and large and small mammals.

Not every species shows the same pattern of decline. Many species, including wolves, show no effects of radiation on their population density. A few species of birds appear to be more abundant in more radioactive areas. In both cases, higher numbers may reflect the fact that there are fewer competitors or predators for these species in highly radioactive areas.

Moreover, vast areas of the Chernobyl Exclusion Zone are not presently heavily contaminated, and appear to provide a refuge for many species. One report published in 2015 described game animals such as wild boar and elk as thriving in the Chernobyl ecosystem. But nearly all documented consequences of radiation in Chernobyl and Fukushima have found that individual organisms exposed to radiation suffer serious harm.

There may be exceptions. For example, substances called antioxidants can defend against the damage to DNA, proteins and lipids caused by ionizing radiation. The levels of antioxidants that individuals have available in their bodies may play an important role in reducing the damage caused by radiation. There is evidence that some birds may have adapted to radiation by changing the way they use antioxidants in their bodies.

Parallels at Fukushima

We tested the validity of our Chernobyl studies by repeating them in Fukushima, Japan. The 2011 power loss and core meltdown at three nuclear reactors there released about one-tenth as much radioactive material as the Chernobyl disaster.

Overall, we have found similar patterns of declines in abundance and diversity of birds, although some species are more sensitive to radiation than others. We have also found declines in some insects, such as butterflies, which may reflect the accumulation of harmful mutations over multiple generations.

Our studies at Fukushima have benefited from more sophisticated analyses of radiation doses received by animals. In one paper, we teamed up with radioecologists to reconstruct the doses received by about 7,000 birds. The parallels we have found between Chernobyl and Fukushima provide strong evidence that radiation is the underlying cause of the effects we have observed in both locations.

Some members of the radiation regulatory community have been slow to acknowledge how nuclear accidents have harmed wildlife. For example, the U.N.-sponsored Chernobyl Forum instigated the notion that the accident has had a positive impact on living organisms in the exclusion zone because of the lack of human activities. A 2013 report of the United Nations Scientific Committee on the Effects of Atomic Radiation predicts minimal consequences for the biota animal and plant life of the Fukushima region.

Unfortunately these official assessments were largely based on predictions from theoretical models, not on direct empirical observations of the plants and animals living in these regions. Based on our research, and that of others, it is now known that animals living under the full range of stresses in nature are far more sensitive than previously believed. Although field studies sometimes lack the controlled settings to the effects of radiation needed for precise scientific experimentation, they make up for this with a more realistic description of natural processes.

Our emphasis on documenting radiation effects under “natural” conditions using wild organisms has provided many discoveries that will help us to prepare for the next nuclear accident or act of nuclear terrorism. This information is absolutely needed if we are to protect the environment not just for ~~man~~ [humanity], but also for the living organisms and ecosystem services that sustain all life on this planet.

There are currently more than 400 nuclear reactors in operation around the world, with 65 new ones under construction and another 165 on order or planned. All operating nuclear power plants are generating large quantities of nuclear waste that will need to be stored for thousands of years to come. Given this, and the probability of future accidents or nuclear terrorism, it is important that scientists learn as much as possible about the effects of these contaminants in the environment, both for remediation of the effects of future incidents and for evidenced-based risk assessment and energy policy development.

### 1AC---ADV: Energy

#### Contention 2 is Energy:

#### Nuclear energy unlocks natural gas exports and stabilizes domestic energy markets, preventing price increases

Cohen 25 [Ariel Cohen; Ph.D. is a Senior Fellow at the Atlantic Council and the Founding Principal of International Market Analysis, a Washington, D.C.-based global risk advisory boutique. He is also Managing Director of the Energy, Growth, and Security Program (EGS) and a Senior Fellow with the International Tax and Investment Center (ITIC). For 22 years, he was the Heritage Foundation’s leading Russia/Eurasia and international energy expert., 2-27-2025, "How LNG Exports Will Define U.S. Energy Policy Under Trump 2.0", Forbes, https://www.forbes.com/sites/arielcohen/2025/02/27/how-lng-exports-will-define-us-energy-policy-under-trump-20/]

President Donald Trump’s guarantee to supply liquefied natural gas to Europe furthers his broader push for U.S. “energy dominance,” marking a stark reversal of the Biden Administration’s pause on the approval of new LNG export infrastructure permits. While Trump’s approach to energy policy correctly identifies LNG as a growth driver and an essential geopolitical lever, expanding LNG exports risks impacting domestic energy prices and should be balanced with other reliable sources of energy like nuclear power to maximize its benefits and ensure long-term energy security.

The Growing Role of LNG Exports in American Energy Policy

Since returning to the White House, Trump has prioritized LNG as a pillar of his energy policy. Following the declaration of a national “energy emergency,” Trump directed federal agencies to eliminate all delays in the permitting process for energy infrastructure projects and, on February 14th, established the “National Energy Dominance Council” to coordinate policies increasing energy production and eliminate “unnecessary” regulation.

LNG has increasingly become an integral tool in expanding America’s geopolitical influence, mainly by providing the US’s European partners with an alternative to Russian gas following its 2022 invasion of Ukraine, a dynamic that was stifled by Biden’s pause. As Europe’s LNG import capacity increases, American natural gas can stabilize global prices and reduce inflation. However, the significance of U.S. LNG goes beyond Europe. While EU demand for natural gas is expected to decline by 2030, Southeast Asian countries are forecast to make up 12% of global LNG demand by 2033.

Given that U.S. LNG offers its customers unique pricing mechanisms and alleviates supply risks, it’s no surprise that energy-starved markets are trying to tap into America’s 21st-century energy commodity.

What is the link between LNG exports and domestic gas prices?

TotalEnergies CEO Patrick Pouyanné focused attention on an important aspect of the U.S.’s LNG agenda, asking Trump what he would do if growth in American LNG exports to Europe increased domestic natural gas prices in the U.S. Pouyanné’s question echoes the findings of the Biden Department of Energy parting shot report released in December, warning that more American natural gas exports risks driving up the price of domestic energy.

Increasing LNG exports can directly boost energy prices domestically by reducing the available supply in the U.S. gas market. This reduction is driving up domestic demand, which is rising as energy-intensive technologies like AI are increasingly adopted across all industries. Data centers account for between 1% and 2% of global energy demand, which could skyrocket to 21% by 2030.

As more LNG export terminals are approved, the U.S. gas market may become more vulnerable to price volatility in the global gas market, straining states that rely on natural gas for power generation. The surge of U.S. LNG exports following Russia’s invasion of Ukraine illustrated this risk. As demand quickly started to outpace supply, high levels of U.S. gas production couldn’t insulate American consumers from the global price shocks, costing them more than $100 billion over a 16-month period.

How the U.S. Can Make the Most of LNG Exports

Nuclear energy – a renewable energy source that does not depend on outside environmental factors like wind and solar – has emerged as a priority in Trump’s energy agenda. U.S. Energy Secretary Chris Wright cited the commercialization of affordable and abundant nuclear energy as a key objective, and the industry has enjoyed a surge of investor interest. Nuclear energy is reliable, with the highest capacity factor of any energy source and, like natural gas, serves as an economically efficient baseload source.

Furthermore, as the U.S. seeks to export more LNG, renewable energy plays a vital role in stabilizing the domestic energy supply, working alongside natural gas to maintain lower energy prices and ensure energy security

The Federal Energy Regulatory Commission and North American Electric Reliability Corporation found that Texas’ overreliance on natural gas was a primary cause of energy blackouts during Winter Storm Uri in 2021. In contrast, in August of 2024, when Texas was hit with record energy demand, it was solar energy production that allowed the Lone Star State to meet the demand without any interruptions.

Renewables, although not suitable to replace hydrocarbons, can supplement the energy supply, enabling the country to maximize the benefits of LNG exports.

#### High electricity prices collapse sustainability of AI development

Loyola 24 [Mario Loyola, JD, Senior Research Fellow for Environmental Policy and Regulation at The Heritage Foundation, "High Electricity Prices Have Europe Facing Deindustrialization; Don’t Let It Happen Here," 2-12-2024, https://www.heritage.org/energy/commentary/high-electricity-prices-have-europe-facing-deindustrialization-dont-let-it-happen]

Rising electricity prices could not come at a worse time. The revolution in artificial intelligence heralds a new age in America’s technological dominance, but only if America can keep its electricity prices low. The power requirements of AI are staggering. In 2021, Google alone consumed 18 terawatt-hours of electricity, more than many of the world’s nations. According to John Henessy, chairman of Google’s parent company Alphabet, a Google search assisted by AI can consume 10 times more electricity than a normal Google search. Powered by AI, Google’s energy consumption could triple by 2027.

Rising electricity prices bode ill for the competition with China. While U.S. electricity prices have soared since Biden’s inauguration, China’s prices have kept steady at a level about 31 percent below ours, and will likely decrease as the country continues building coal-fired power plants at a frenetic pace. China’s tech industry is quickly catching up to America’s and could meet Chinese premier Xi Jinping’s stated goal of surpassing the U.S. by 2030.

America has been at the forefront of every major technological innovation since the Industrial Revolution began, a major reason the U.S. became the world’s superpower. Part of the reason has been abundant energy supply. But that era could be coming to an end.

U.S. policymakers should heed warnings from Europe, and embrace a policy of making American electricity once again the most reliable and affordable on Earth.2

#### Deterrence collapse is inevitable absent AI to close operationalization gaps for detection and attribution---otherwise adversaries like Russia, China, North Korea, and Iran escalate in grey zones and hybrid war

Lynch & Morrison 23 [Justin Lynch, Senior Director for Defense at the Special Competitive Studies Project (SCSP). Prior to SCSP, he served at the National Security Commission on Artificial Intelligence, at the House Armed Services Committee, and in the United States Army. He is a term member at the Council on Foreign Relations and a nonresident fellow at the Atlantic Council; Emma Morrison, national security professional who has served at the Special Competitive Studies Project and at the House Armed Services Committee, “Deterrence Through AI-Enabled Detection and Attribution,” July 2023, https://kissinger.sais.jhu.edu/programs-and-projects/kissinger-center-papers/deterrence-through-ai-enabled-detection-and-attribution/]

Throughout the Cold War, deterrence theory served as the guiding concept for much of U.S. strategy. Today, however, many practitioners struggle to turn deterrence theory into an effective strategy. While the theory remains fundamentally sound, operations that are difficult to detect and attribute have challenged efforts to implement it as strategy.[1]The increasing proliferation and power of capabilities enabled by sensors, computers, and artificial intelligence (AI) are creating opportunities for deterrers to better detect and attribute offensive operations and to reduce the challenge of translating deterrence theory into effective strategy.

This essay begins by establishing a theoretical framework. It then shows that operations that challenge detection and attribution undermine the credibility of deterrence efforts. Gray zone operations, hybrid operations, and cyber warfare in particular exploit this vulnerability in deterrence strategy. The essay then shows that machine learning and data fusion offer opportunities to improve detection and attribution, increasing the credibility of deterrence strategies and the relevance of deterrence theory. The essay closes with a brief discussion of how such capabilities could affect escalation dynamics between great powers.

A Challenge to Classic Deterrence Theory and Strategy

In his 1966 work, Arms and Influence, Thomas Schelling defined deterrence as seeking “to prevent from action by fear of consequences.”[2] Patrick Morgan then refined Schelling’s definition by elaborating on the relationship between the actors in a dyad, stating that the “essence of deterrence is that one party prevents another from doing something the first party does not want by threatening to harm the other party seriously if it does.”[3] In their contributions to the study of deterrence, Robert Haffa and others before him argued that to effectively deter a challenger, a deterrer must have sufficient capability, credibility, and communication. Haffa defined capability as “the acquisition and deployment of military forces able to carry out plausible military threats to retaliate in an unacceptable manner or to deny the enemy’s objectives in an unaffordable way.”[4] He also defined credibility as “the declared intent and believable resolve to protect a given interest”[5] and described communication as “relaying to the potential aggressor, in an unmistakable manner, the capability and will to carry out the deterrent threat.”[6]

This taxonomy has more than just semantic value. Separating theory and strategy allows the application of theory to be examined without challenging theory itself. Subdividing deterrence into the components of capability, credibility, and communication allows for simplified, useful analysis of how detection and attribution affect the credibility component of the strategy with less focus on capability and communication.

The Challenge to Deterrence Strategy

Deterrence strategy, and a state’s ability to effectively employ it, is dependent on the state’s ability to demonstrate capability and credibility and to clearly communicate those signals to a potential adversary. Credibility cannot be achieved without effective detection and attribution. Without detection, would-be deterrers are unable to mount an effective strategy of denial or threaten retaliation as part of a strategy of punishment. Without attribution, defense is possible, though punishment cannot be targeted at a specific actor. While detection and attribution are not the only components of credibility, they are essential.

In the aftermath of the First Gulf War, China and Russia sought to increase their conventional military power, while heightening their emphasis on conflict in the gray zone, adopting new hybrid tactics, and employing information operations.[7] This evolution of warfare has continued to serve U.S. adversaries, enabling them to use force, coercion, and deception to pursue their objectives while reducing the probability of detection and attribution; by extension, they have lowered the probability of a credible threat of effective U.S. defense or retaliation.

Gray Zone and Hybrid Operations

Gray zone and hybrid operations pose a detection and attribution challenge due to their inherent ambiguity. Gray zone operations are a strategic approach using coercive actions in the liminal space between armed conflict and more ordinary diplomatic and economic activity.[8] Hybrid operations are an operational approach that use a combination of capabilities—including diplomatic, economic, and informational tools—to create a psychological and physical advantage.[9] Given that gray zone operations are a strategic approach and that hybrid operations are an operational approach, they are neither equivalent terms nor mutually exclusive. Instead, a state can use a gray zone strategy with or without a hybrid operational approach, and vice versa. Both approaches endeavor to create ambiguity. Because of this shared characteristic, both enable an actor to “evade detection outright or to frustrate intelligence efforts to attribute blame, quantify risk, and inform decisive responses.”[10]

Several countries around the world have implemented such tactics over the last twenty years. To cite a few examples, Israel has used hybrid operations in its fight against Hezbollah; Russia has done so in its 2014 seizure of Crimea and its all-out invasion of Ukraine since February 2022; and countries like China, Russia, Iran, and North Korea have employed such measures against the United States. Detection and attribution remain a challenge.[11] Jake Harrington and Riley McCabe noted in a 2021 brief about the 2020 U.S. presidential election that Russia used “multiple cut-outs and proxies” to employ agents in Nigeria and Ghana to make unattributed gray zone attacks on the United States as part of a broad campaign of election interference.[12]

One reason deterring such operations is so difficult is that they often involve several distinct proxy actors and frequently span multiple “hazy domains,” including “economic influence, information operations, and other political, diplomatic, or commercial activities that defy easy categorization or clear connection to a known campaign of malign behavior.”[13] When seemingly unrelated or insignificant actions could ultimately be revealed to be part of a broader, more insidious plot, targeted actors are left overwhelmed by action inputs, unable to sift through and distinguish “a significant attack from a false alarm.”[14] This is particularly true for information operations, a favored tool of practitioners of hybrid warfare.

Information Operations

Information operations, including cyber operations, offer particularly adept methods of conducting warfare beyond what the United States can easily detect and attribute, and they are widely used in both gray zone and hybrid operations. They can be defined as the “use of social media and other outlets, in addition to traditional efforts, to bolster the narrative of the state through propaganda and to sow doubt, dissent, and disinformation in foreign countries.” Information operations include the use of propaganda (perhaps misleading, but factually true, information), misinformation (unintentionally false information), and disinformation (intentionally false information).[15] Several U.S. adversaries have favored information operations while striving to obtain a strategic advantage over the United States.[16]

According to the Center for Strategic and International Studies (CSIS), since 2006, there have been roughly 1,000 known significant cyber incidents worldwide against “government agencies” or “defense and high tech companies,” or “cyber economic crimes with losses of more than a million dollars.”[17] It is reasonable to expect that many more attacks in this realm have gone unreported, undetected, and unattributed. After all, a significant number of those listed by CSIS remain publicly unattributed to any state or nonstate actor. Many more future cyber incidents will certainly follow.

Russia has come to depend on information operations as its “most effective gray zone tactic”—a tactic that continues “to be well-funded, relentless, and prolific,”[18] as expressed by Moscow’s military doctrine, which scholars have found “frequently equates the strategic impact of information weapons with that of weapons of mass destruction.”[19] Though Russia was responsible for a higher percentage of known information operations using disinformation between 2013 and 2019 than any other country (72 percent), China has also begun to use disinformation operations more. In 2020, Beijing conducted a misinformation campaign on Facebook to promote pro-China messaging in the Philippines.[20] Using cyber operations to not only conduct “espionage and intelligence gathering but also to target other states’ critical infrastructure and disrupt political processes abroad,”[21] Russia and China have demonstrated the power and potential of this method of warfare.[22]

The indicators of an information or cyber operation are typically more difficult, labor intensive, and time-consuming to detect or attribute than those of conventional war.[23] The link between the attack and attacker is typically apparent during most conventional attacks, such as an observed aerial bombing.[24] In contrast, information operations, like those examined by the U.S. cybersecurity firm CrowdStrike, require significant resources to get from detecting an attack by an individual operator to attributing that attack to a specific aggressor. CrowdStrike’s 2014 Putter Panda report outlined one such example in great detail, attributing a series of “coordinated breaches” from a single user handle to a specific individual affiliated with the People’s Liberation Army.[25]

The internet is such that virtual anonymity is possible in the absence of intense scrutiny. According to one expert, “adversaries can exploit any number of system or protocol vulnerabilities to hide or spoof their location and can operate from nearly any physical location.”[26] What is an already difficult knot to untie is further tangled in legal and political complications that delay attribution, especially in circumstances where multilateral cooperation is required.[27] Finally, the mass quantities of data a targeted state might possess on such attacks is only as strong as the targeted state’s ability to understand it. As one scholar has put it, “intelligence services struggle to interpret data, and the more they collect, the more they face the challenge of separating meaningful information from background noise.”[28] Ultimately, this flood of information is the key to attribution, but without the appropriate tools and methods, it is also the fog that obscures these attacks.

The efficacy of deterrence strategy is dependent on the efficacy of an actor’s detection and attribution efforts. To quote one expert, “you cannot deter unless you can punish and you cannot effectively punish unless you have attribution.”[29] This is because a display of resolve, without the credibility of consistently detecting and attributing attacks, is likely to be dismissed. Therefore, any actor that hopes to combat such attacks and ultimately deter future ones needs to strengthen its ability to detect and attribute such tactics. This is not to say that credibility is the product of detection and attribution alone or that strengthening detection and attribution will, on its own, result in credible deterrence. Instead, as necessary but not sufficient components of deterrence, strengthening detection and attribution will shore up one important weakness in deterrence strategies.

How to Strengthen Detection and Attribution

Strengthening attribution and detection would require a country’s government, especially its military services and intelligence agencies, to accomplish several related objectives. First, given that some of the offensive actions described above are designed to avoid detection, intelligence agencies and military services would need to observe more adversary actions in all five domains (land, sea, air, space, and cyber). Second, they would need to understand which of these events are significant, either as actions in their own right or as indicators of future actions. Third, they would then need to focus more attention on potential significant events and to identify when and how these events take place and who is causing them. Finally, all of this information would need to be pulled together into a coherent narrative that would inform policymakers and military and intelligence leaders.

Technological developments, particularly the growing prevalence of sensors and the power of AI, can help intelligence agencies and militaries perform these demanding tasks. Far more of the planet is observed with greater frequency today. The proliferation of large constellations of commercial satellites has been one notable development. Companies like Skybird have observed militaries, nuclear reactor and centrifuge sites, and missile launches for more than a decade.[30] An increasing number of companies like BlackSky, OneAtlas, ICEYE, and others collect imagery from space ever more frequently and provide imagery, including synthetic aperture radar imagery, to governments.[31] The explosive growth in the use of smart phones and the way they combine location data and photos offers another means of collection, especially when photos are posted on social media sites or messaging apps. Internet users also leave data exhaust online that shows their searching, reading, and other habits.[32] These changes are making it more difficult to avoid detection in every domain, even the most traditionally opaque ones like outer space, under the sea, and cyberspace.[33]

While the large increase in sensors will help militaries and intelligence agencies observe significantly more events, this shift also has the potential to complicate their work rather than automatically strengthening detection or attribution. The sheer volume of data creates one challenge. According to one estimate, there were more than 600 million surveillance cameras in China alone prior to the coronavirus pandemic.[34] Data from thousands of satellites, billions of people and bots on social media, and other information sources have the potential to overwhelm both analysts and decision-makers, particularly during crises.[35] To complicate matters further, much of this information comes from commercial partners or nontraditional data sources like open-source intelligence on social media platforms. Tapping into these alternative sources requires intelligence agencies to partner with commercial entities to purchase their data or analysis and to integrate their work into intelligence assessments.[36]

AI can help analysts understand which events are significant, focus their attention, help them attribute actions, and aid them in presenting usable information to decision-makers.[37] The most common definitions of AI revolve around using machines to perform tasks that usually require human or some other form of intelligence.[38]

The Defense Advanced Research Projects Agency sees AI as having come in two broad waves, with another one to come. The first wave involved expert systems that were built manually, often by interviewing subject matter experts and encoding their knowledge as rules, an approach that has proven limited for use at scale.[39] The second and current wave of advances in AI consists mainly of statistical models trained on data via machine learning. While machine learning algorithms, specifically neural networks, have limited contextual capabilities and minimal reasoning abilities, they are quite adept at recognizing patterns in data, especially extremely large data streams when given access to powerful or application-specific hardware. Such an algorithm can discover correlations in such datasets and optimize a computer programming framework to perform assigned tasks. This gives them classification, inference, and prediction capabilities that can be more effective than those of previous generations of software and hardware.

Despite these advances, machine learning has significant limitations. It reflects the limitations and biases of the datasets used to train it. Likewise, the speed at which algorithms can be trained to infer is limited by the computing power available. Such algorithms also struggle to perform in many unstructured environments. Structured environments provide well-defined and discrete parameters, choices, and outcomes. Many of AI’s best known victories, such as AlphaGo’s victory over champion player Lee Se-dol in the board game Go, have taken place in structured environments.[40] When performing tasks in unstructured settings, AI must create and continuously update a model of the world, including potentially unfamiliar environments.[41] Machine learning tools have often struggled to accurately reason in unstructured environments, particularly for the type of high-stakes decision-making performed in warfare.[42] Most machine learning algorithms are also narrow and brittle, performing only a very specific task or set of tasks. Placing such algorithms in unfamiliar conditions, or assigning them unfamiliar tasks, can result in failure, sometimes in unpredictable ways.[43]

The third, still-theoretical wave of AI would be much closer to artificial general intelligence (AGI), or AI that extends beyond narrow capabilities to broader, more human-like abilities.[44] If and when the third wave of AI develops, its systems are expected to perceive, learn, abstract, and reason in ways much closer to humans than first- and second-wave AI systems.[45] One example of a military application of third-wave AI would be “a fully autonomous ship that uses algorithms to maneuver in situations it was not specifically trained for (such as inclement weather or contested waters); it would be capable of planning, relaying, and carrying out military missions similar to the way a human would.”[46] The consensus is that third wave models will take some time to develop. As a result, second-wave machine learning applications will dominate AI-enabled systems for the foreseeable future.[47]

Machine learning offers multiple ways to help collect and process information in a manner that may strengthen attribution and detection efforts. AI-enabled autonomy can help direct intelligence collection in both physical and digital domains by both directly guiding collection assets, such as semi-autonomous drones,[48] and by providing collection guidance called autonomous tipping and cueing for individual assets.[49] Machine learning can also assist with analyzing collected data. Supervised learning algorithms trained for image recognition can identify objects far faster than human analysts can, as in the case of the Department of Defense’s most prominent AI use case, Project Maven.[50] Unsupervised learning algorithms can zero in on patterns in data, including patterns too complicated for humans to identify without algorithmic assistance.[51]

Far from a hypothetical scenario, the U.S. military, intelligence community, and private sector already use AI in ways that can strengthen detection and attribution. The most prominent example is Project Maven, which uses machine vision to help analysts identify objects in footage and imagery much more quickly, and in much greater quantities, than would be possible for human analysts alone. The Army has built on Project Maven’s work to develop Scarlet Dragon, a “target recognition” software that is already used in live fire drills. Prometheus similarly uses AI to sense and identify targets from space.[52] The Air Force used an AI tool developed in just five weeks to pilot a U-2 aircraft in December 2020, has integrated AI into its all-domain operating picture (known as the Advanced Battle Management System), and is partnering with the Space Force to develop an AI-enabled space awareness capability.[53] In the private sector, commercial drones have the ability to autonomously recognize and track specific individuals while developing a real world map, planning a path, and avoiding obstacles.[54]

As a result, intelligence agencies and militaries that integrate AI into their operations and processes have the potential to significantly increase their abilities to collect data, make sense of that information, and highlight important findings for decision-makers. Increasing the collection and visibility of relevant information will strengthen these government actors’ ability to detect activities that previously evaded sensors, were lost in the noise, or that can only be detected by combining multiple data inputs. Doing so will also strengthen their abilities to attribute actions to the relevant parties by associating disparate attribution indicators even in cases involving hard-to-detect activities.[55]

One of the most promising ways to use AI to strengthen detection and attribution is data fusion. Data fusion plays an important role in helping intelligence analysts and military personnel detect and draw connections between phenomena from different types of sensors and in different databases.[56] Drawing on digital signal processing, statistics, control theory, and other fields, militaries have used data fusion for decades to improve intelligence collection and command and control, primarily by combining data streams from the same type of sensors.[57]

Fusion Model

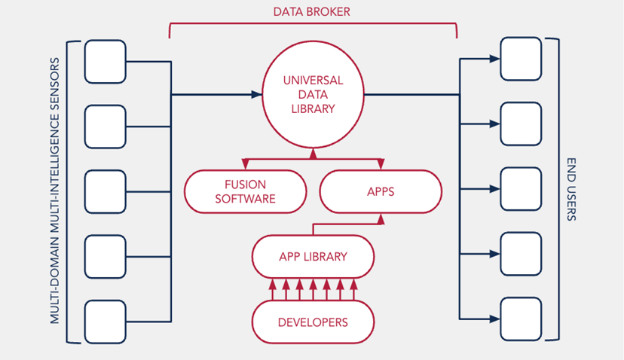


Figure 1. A Data Fusion Model

Data fusion is likely to evolve to be able to fuse many heterogeneous data streams coming from tactical intelligence assets into strategic intelligence analysis.

The growing ubiquity of sensors and the power of AI-enabled analytics means that data fusion is likely to evolve to be able to fuse many heterogeneous data streams coming from tactical intelligence assets into strategic intelligence analysis. Figure 1 shows how a networked system can integrate data from many diverse sensors into usable information for a variety of end users.[58] Together, data fusion systems enable sensors, a data broker, applications, and end users to compile large amounts of data from diverse sources and make it far easier for end users to detect and attribute adversaries’ activities by identifying important information and connecting disparate activities.

Sensors: Multidomain sensors from multiple intelligence sources provide inputs to the data broker. The sensors include traditional intelligence sources, such as satellite imagery, human intelligence reports, signals intelligence, and electronic intelligence. This would also include publicly available information, such as information posted on social media and commercially available intelligence, such as commercial satellite imagery.[59] As data fusion systems become more sophisticated, a growing number and variety of sensors will be able to provide inputs to the same data broker.

Data Brokers: The data broker is a database that organizes and catalogs the intelligence provided by the sensors in a format and location on the network that allows this information to be used by the applications in the application library.

Applications and application library: The application library is a set of software tools available to end users to process and analyze data held by the data broker. While some of the applications are AI-enabled, they would use (potentially several) narrow AI applications and would be directed by a human end user.

End users: The information produced by applications used to access the fused datasets would support a range of parties including analysts serving in strategic intelligence roles, analysts in operational and tactical military headquarters, fielded units and systems, and even the people and algorithms that guide the sensors that provide such inputs.

Governments that establish a strategic-level data fusion system will be able to improve their ability to detect and attribute adversaries’ activities. Large volumes of information from heterogeneous datasets would be accessible at a single point for analysis with a prepared and regularly updated set of applications. This would allow end users to use many data points to detect otherwise invisible events like cyber attacks or geopolitically motivated financial moves. It would also help end users attribute actions by quickly using a wealth of data to more effectively determine the actors involved, their methods, and who employed them.

Strengthening Deterrence

When an adversary manages to ensure that its operations and preparations for those operations avoid detection and attribution, that reduces the probability that targeted countries will adequately prepare to respond. This increases the probability of the aggressor accomplishing its goals and decreases its likely cost of victory, undermining the credibility of deterrence strategies. Technology is granting intelligence agencies and militaries the ability to monitor an increasingly large portion of the world using an ever greater variety of sensors, to combine that intelligence into a more coherent whole, and to understand it using AI-enabled software.[60] As this shift takes place, governments will be significantly more likely to be able to detect and quickly attribute gray zone and hybrid tactics, cyber incursions, and other types of attacks.

Strengthening detection and attribution would create more opportunities to try to defeat or deter gray zone and hybrid tactics, cyber attacks, and other operations by adversaries. Detecting preparations for operations or operations themselves would allow targeted governments to plan and prepare specific diplomatic, military, or economic responses to reduce the probability of an enemy’s success or increase the cost of the foe’s offensive operations. For example, if Ukraine had been able to detect Russia’s preparations to send irregular forces into Crimea in 2014, or their arrival in the region prior to more conventional Russian operations, they would have been better equipped to stage forces in Crimea, preempt Russian information operations, and strengthen Ukrainian cyber defenses, reducing the probability of a successful Russian seizure of Crimea or increasing the cost of doing so. The United States and the North Atlantic Treaty Organization (NATO) did detect Russian preparations for an invasion of Ukraine in 2021 and 2022, and they consequently helped disrupt Russian information and cyber operations.[61] The United States and NATO did not, however, deter a conventional attack, reinforcing the point that detection and attribution merely create opportunities to defeat or deter attacks and do not automatically result in deterrence success.

Retroactive attribution also can possibly strengthen efforts to deter operations that have typically been difficult to attribute. More quickly attributing the identities and intent of offensive actors in cyberspace, of state-affiliated criminals, or of geopolitical actions whose moves are disguised as benign economic activity such as some infrastructure projects or dual-use research would help the identifying countries coordinate responses with their allies and partners. While this might result in military action, it might also help partners coordinate sanctions, increasing the economic cost of adversarial offensive operations.

The emergence of machine learning and its application through a data broker model of data fusion has the potential to strengthen deterrence. As these technologies continue to improve, states will probably come to believe that their adversaries are highly likely to detect and attribute their preparations for or execution of offensive operations, and targeted countries could therefore have greater opportunities to punish, or even block, offensive operations. Stephen Van Evera’s research in Causes of War showed that states that believe they do not have a first-mover advantage, including because they cannot achieve the element of surprise, are less likely to engage in offensive operations.[62] As John Mearsheimer has argued, “deterrence—a function of the costs and risks associated with military action—is most likely to obtain when an attacker believes that his probability of success is low and that the attendant costs will be high.”[63] Decreasing the probability of cheap or quick victories has the potential to strengthen deterrence and stabilize relationships between competing great powers.[64]

#### Independently, energy diversification prevents great power war

---GPR = Geopolitical Risk

Liu et al 23 [Fangying Liu, School of Economics, Qingdao University, Chi-Wei Su is a full professor in School of Economics, Qingdao University, Meng Qin, associate professor in School of Marxism, Qingdao University, Oana-Ramona Lobont, Associate Professor at the West University of Timisoara, Finance Department, “Winner or loser? The bidirectional impact between geopolitical risk and energy transition from the renewable energy perspective” Energy Volume 283, 15 November 2023, https://www.sciencedirect.com/science/article/pii/S0360544223025689#bib6]

This article explores the time-varying causalities and features between renewable energy (RE) and geopolitical risk (GPR). Energy transition is defined as increasing renewable and clean energy use to reduce negative environmental externalities from energy consumption [1,2]. Energy sustainability has long been regarded as the lifeblood driving economic development and ensuring national security [3]. In recent decades, the endless rise in energy demand has been accompanied by numerous significant issues, such as global warming, energy competition and international conflicts [4,5]. Increasing energy scarcity exacerbates contradictions and conflicts between resource-consuming countries, leading to large-scale geopolitical wars [6,7]. Competition over traditional energy is a leading factor in triggering global geopolitical conflicts, and a diversified energy supply can mitigate the risk of energy competition [8]. Hence, finding alternative energy to reduce GPR posed by energy competition and promote energy transition has become a significant concern for global governments [6,9]. As a clean and pollution-free green energy, RE plays an increasingly important role in shaping the energy market and increasing energy supply [10,11]. Moreover, the unlimited supply of RE allows it to replace the application of traditional energy and decreases energy competition's negative impact on the global political situation [2,3]. It is noteworthy that a stable political environment is an essential factor in driving the deployment of RE. The interlinkages between the GPR and energy transition have received widespread attention due to the frequent outbreak of global trade disputes and geopolitical conflicts. It can be seen that probing the transmission mechanism between GPR and RE is of profound significance for facilitating energy transition and ensuring energy security.

#### Global threats and hotspots are primed for miscalculated escalation from energy insecurity

Heath et al 22 [Timothy R. Heath1, Kristen Gunness2, Tristan Finazzo3, 1senior international defense researcher at RAND, prior to joining RAND in 2014, Heath had over fifteen years of experience in the U.S. government researching and analyzing military and political topics related to China, Ph.D. in political science, George Mason University; M.A. in Asian studies, George Washington University; B.A. in philosophy, College of William and Mary, 2associate research department director, defense and political sciences department; senior policy researcher; and professor of policy analysis at the Pardee RAND Graduate School. Formerly, she served as the Director of the Navy Asia Pacific Advisory Group at the Pentagon, where she advised the Chief of Naval Operations on Chinese security and foreign policy trends in the Indo Pacific region, worked with a range of U.S. Department of Defense and private sector clients throughout her career and advised senior leaders in the United States Navy, USINDOPACOM, Office of the Secretary of Defense, and the Intelligence Community. She holds a B.A. from Tufts University in international relations, a certificate in Chinese studies from the Johns Hopkins SAIS Nanjing Center, and an M.A. in security studies from Georgetown University’s Walsh School of Foreign Service, 3at the time of writing, research assistant specializing in China at the RAND corporation with a bachelor’s degree in international/global Studies from the University of Chicago. Presently has a M.A. Global Journalism and East Asian Studies from the Arthur L Carter Journalism Institute at NYU, “The Return of Great Power War”, Chapters 2-3, pg13-46, ISBN: 978-1-9774-0816-7, Published by the RAND corporation, 08/10/2022, https://www.rand.org/pubs/research\_reports/RRA830-1.html]

Increasing International Fragmentation and Disorder

A symptom of an international system in transition away from a U.S.-led unipolarity is its increasing fragmentation and disorder, a trend recognized by both Chinese and Western analysts.7 The 2019 report China’s National Defense in the New Era states that “global and regional security issues are on the increase.” It cites problems of eroding international arms control, nonproliferation, and disarmament efforts, the intensification of arms races in Asia and other regions, the spread of extremism and terrorism, and the increase in non-traditional security threats involving cybersecurity, biosecurity, and piracy.8 A report from the U.S. Office of the Director of National Intelligence similarly anticipates a more uncertain and fractured international order and describes an evolving international order that features “uncertainty about the United States, an inward-looking West, and erosion of norms for conflict prevention and human rights.”9

Increasing international fragmentation poses both challenges and opportunities to China. Beijing has already had to confront the reality of internal breakdown in some of its partner countries. The PLA Navy sent a frigate to safeguard evacuees in Libya in 2011, and the PLA conducted a larger noncombatant evacuation operation in Yemen in 2015 for more than five hundred citizens of various countries.10 Chinese officials have had to grapple with persistent civil strife in key BRI partner countries such as Pakistan.11 Chinese articles have also pointed to the dangers posed by the Syrian civil war, the Israeli-Palestinian conflict, unrest in Africa, and the Iran nuclear issue, all of which pose some level of threat to Chinese energy sources, markets, and natural resources.12 In the Asia-Pacific, Chinese analysts have argued that rising regional competition between China and the United States is likely to result in increased regional instability.13 To illustrate, scholars point out that China’s neighbors such as India and Japan attach importance to economic cooperation with China while simultaneously deepening security ties to the United States.14 They also note that regional confrontations, such as those involving North and South Korea, remain complex, featuring the involvement of several great powers and other regional powers.15 Chinese analysts also assess that regional hot spot issues remain contentious and that the risks of conflict in the India Pakistan disputes and those regarding the Senkaku Islands and Taiwan may have increased.16

But China, Russia, and others have also taken advantage of greater international disorder to secure gains. In 2022, Russia launched a large-scale invasion of Ukraine. China and Russia in particular have successfully advanced their interests through measures short of war, also known as gray zone operations. A recent RAND report notes that adversary use of gray zone tactics through paramilitary forces and emerging military and communications technologies can destabilize states with increasing ease.17

The fragmentation of the international order shapes the future operational environment in which U.S.-China conflict might emerge. It creates greater uncertainty and therefore increases the risks of miscalculation. The exacerbation of long-standing security issues, the spread of diverse threats, and the weakness of global governance mechanisms raise the prospect that nontraditional and traditional threats could overlap and aggravate one another, a trend already well demonstrated in the case of Syria, where civil conflict, fueled by mass migration owing in part to the effects of climate change, has intensified interstate feuding between Russia and the United States. In the future, China’s deepening involvement with troubled states along BRI routes raises the possibility of conflict scenarios that arise, perhaps suddenly, from unexpected sources. Escalation in such volatile and confusing situations may become unpredictable. Tensions, crises, and conflict involving Chinese- and U.S.-backed forces could occur within the context of nontraditional threats and issues that complicate and aggravate conflict tendencies. In this analysis, the United States may need to find ways of responding to traditional and nontraditional threats even as it manages a systemic conflict with China.

Competition for Resources and Markets

Another geopolitical trend that could affect conflict scenarios involving China and the United States concerns the competition for resources and markets. China’s ability to garner natural resources as its energy demand continues to grow could influence its military operations abroad. According to a 2016 North Atlantic Treaty Organization (NATO) report, energy security will remain a major concern for most countries, with large resource deposits located in unstable regions of the world.18 The U.S. Energy Information Administration projects that global energy demand will increase 50 percent by 2050, with demand led by growth in Asia.19 This will likely result in competition for resources, which in turn will lead to instabilities in different regions, from the Arctic to the Middle East and from South America to the South China Sea.20 In addition to energy, the increase in technical and electronic products requiring rare earth minerals has created another area of competition, such that countries willing to endure the high environmental costs of recovering them could manipulate access to the minerals for coercive purposes, as China has done in the past. Of the 33 minerals that the U.S. Department of the Interior listed in February 2018 as essential to the U.S. economy, China was the top producer of 19 and the top supplier of 12.21

Competition for energy is another trend that will likely persist for the foreseeable future. China currently imports oil and gas from more than 40 countries. In 2019 China imported approximately 10.1 million barrels per day of crude oil, which met approximately 77 per cent of its needs, and China’s imports of natural gas could grow from 23.8 percent in 2021 to 46 percent by 2035.22 Most of China’s oil and natural gas imports come primarily from Africa, Central Asia, the Persian Gulf, and Russia. Beijing has become adept at intertwining its search for diverse sources of energy to support its economic development with its desire to increase political and economic influence. The clearest example of this is the BRI, Xi Jinping’s ambitious project aimed at linking China to more than 60 countries across Asia, Africa, Europe, and Oceania through infrastructure projects, energy cooperation, and technology deals (Figure 2.1).23 Through the BRI, China has increased overland oil supply via pipelines from Kazakhstan and Russia. In 2019 approximately 34 percent of China’s natural gas imports came from Turkmenistan via a pipeline that runs through Kazakhstan and Uzbeki stan. While China has sought to diversify energy suppliers and reduce dependency on strategic choke points, it will continue to rely on sea lines of communication (SLOC) such as the South China Sea and the Strait of Malacca for most of its hydrocarbon deliveries. The large volume of oil and natural gas imported from Africa and the Middle East will make securing strategic SLOC a priority for China for at least the next 15 years.24 In 2019, approximately 77 percent of China’s oil imports and 10 percent of its natural gas imports transited the South China Sea and the Strait of Malacca.25

China’s energy security interests extend to the Arctic region. China has invested in the Power of Siberia natural gas pipeline and financed the liquid national gas project in Yamal.26 This, combined with the opening of the Northern Sea Route, has provided the foundation for future energy cooperation between China and Russia. China’s Polar Silk Road, part of the BRI, is expected to serve as a vehicle for increased Sino-Russian investment and cooperation in building Arctic infrastructure to support commercial transit and resource exploration along the Northern Sea Route.27

Competition for natural resources and energy will likely persist even if China and the United States were to escalate their rivalry into conflict. Efforts to control access to vital resources could overlap and exacerbate related crises and wars, especially in countries holding important energy reserves, such as those in Africa, the Middle East, Central Asia, and possibly the Arctic regions. China’s desire to ensure secure supplies could conflict with demands by U.S. allies and partners for access to the same resources. The result could be mutually reinforcing sources of tension and fighting, which could add another layer of intractable conflict to a U.S.-China systemic war.

[[paragraphs condensed]]

China’s Growing Leadership in the Global Economy As has been noted, the evolution of the global economy is expected to feature the growing strength of developing countries and receding strength of the industrialized West. Experts have described how the world economy may rely more on China and developing countries for future growth. Chinese sources in particular have highlighted the importance of the BRI, the massive Chinese-led trade and investment infrastructure project connecting Africa, Eur asia, and parts of Latin America. Both a Nineteenth Party Congress report and a 2019 foreign policy white paper promote a new version of globalization centered on the BRI.28 Although BRI projects have come under considerable criticism for their role in encouraging unsustain able debt and other problems, most Western experts agree that the future evolution of the global economy will likely feature a larger role for emerging economies, many of which are BRI partners. The World Bank estimates that implementation of major BRI projects could increase global trade by 1.7 to 6.2 percent and raise world incomes by 0.7 to 2.9 percent.29 But a world economy that features greater Chinese leadership could face its own challenges. China and other countries may need to commit military resources to help manage the secu rity challenges posed by disorder and fragmentation in the developing world. Future growth also faces challenges from economy-related issues. The Nineteenth Party Congress report, for example, notes that the “gap between rich and poor countries continues to widen.” It also observes that global economic growth has remained slow.30 Western scholars have simi larly highlighted trends toward imbalanced global economic development and inequality, slowing growth, a reduction in the economic interdependence that has traditionally served as a restraint on interstate violence, and weakened norms and international institutions.31 Although the global economy could experience deceleration and fragmentation, interna tional commerce would still depend on vital SLOC and maritime trade routes. China’s over seas trade will continue to depend on several major commercial shipping routes that pass by regions such as the Bay of Bengal, the North Sea, the South China Sea, the Strait of Malacca, and potentially the Arctic.32 China has long had concerns about the vulnerability of mari time trade routes to piracy.33 The BRI’s Maritime Silk Road, which seeks to better connect China and open new trade routes through strategic access to global ports and waterways, will also create maritime vulnerabilities such as greater exposure to piracy and terrorism.34 The increasing importance of digital services and technologies means that infrastructure for information technology could also become a more important aspect of the global economy. As but one example of the increasing importance of the digital economy, China’s digital pay ments accounted for 40 percent of the world total and were worth US$790 billion in 2016.35 Although the future expansion of the digital economy is constrained by a large rural work force that cannot be easily absorbed into the digital economy, cyberspace will likely remain important for China’s economic security.36 China’s role in leading the “new economic globalization” centered on BRI provides a strong incentive for its military to increase efforts to build military partnerships with clients. The PLA could increase operations to counter nontraditional threats and help build partner capacity in select countries in Africa, the Middle East, South Asia, and Southeast Asia, as well as along maritime routes through the Indian Ocean and South China Sea. The Arctic region could play a more important role in global commerce, raising the risk of militarization in that area. U.S. allies and partners may find themselves in disputes with Chinese client states, which could result in proxy conflicts between China and the United States. The overlap of resources and markets with BRI routes suggests that prospects for conflict could be higher in all these areas. Shifts in International Partnerships Although Western countries may, in general, see their collective share of world GDP decline while that of the developing world increases, major developed countries are expected to continue to remain key players in the future world order. Both Chinese and Western sources agree that the world is moving away from a unipolar system dominated by the United States. However, they continue to debate what might come next. Chinese analysts anticipate the advent of an international system characterized by multipolarity. Fang Changping defines multipolarity as “power distributed more evenly among the major countries and an increased willingness on the part of major countries to act independently of the United States.”37 Chi nese scholars and others perceive multipolarity as providing China more freedom to maneu ver while decreasing vulnerability to hostile action by the United States.38 Multipolarity is also viewed as one of the driving forces behind the reshaping of an international system that China views as primarily dominated by and benefiting the United States. As Yang Jiemian observes, “The multipolarization of international power has been a long-term, historical process of development that is only beginning to see the gradual balancing of international influence between the East and the West in sectors long dominated solely by Western powers, including economy, politics, science and technology, culture, education, and public opinion.”39 Western scholars have also noted the fragmenting of Western power and the increasing might of rising major powers around the world. Analysts no longer regard the prospect of a postunipolar world as implausible and instead debate the implications of a world characterized by bipolar ity, multipolarity, or with “no hegemon.”40 While Chinese scholars describe the benefits that their country receives from a trend toward multipolarity, they also appear to recognize the challenges it brings. Fang Changping notes that multipolarity creates uncertainties for China in the security environment, particu larly relating to the U.S.-China bilateral relationship: Multipolarity is advancing global interconnectedness in ways that support China’s goals of “peace and development” but is also giving rise to several new issues of instability, including rising global inequality, regional hot spot issues, and nontraditional security threats. . . . The uncertainties in the security environment and development issues result ing from regional multipolarization make Sino-U.S. relations a primary factor in deter mining the stability of China’s peripheral and overall external security environments.41 In this understanding of multipolarity, Europe and the United States may remain friendly with one another, but would operate autonomously rather than as close allies. Other rising powers in the developing world, such as Brazil, India, or South Africa, could also play increas ingly important roles in international politics.42 In short, some partnerships may grow weaker, while new ones may emerge for either China or the United States. This may result in a more dynamic and fluid set of international coalitions in a situation featuring intense U.S.-China rivalry and even conflict. Multipolarity could also allow China to expand its informal rela tionships with countries outside the region, such as in Latin America. There are also risks that multipolar competition could become more destabilizing. One Chinese article notes that the United States is engaging in “technological and institutional innovation in pursuit of absolute military superiority,” while France, Germany, India, Japan, and the United Kingdom are rebal ancing and optimizing the structure of their military forces. This, combined with advances in artificial intelligence (AI) and other military technologies, means that China’s military secu rity is vulnerable to “technology surprise and a growing technological generation gap.”43 In a multipolar world featuring a China nearing global primacy, China and Russia could become close partners. There has already been an increase in military cooperation between the Chinese and Russian armed forces over the past several years.44 In June 2019 the two nations upgraded their relationship to a “comprehensive strategic partnership.”45 Chinese scholars generally anticipate that the bilateral relationship will grow even stronger.46 Over the next several decades, the two countries could expand the scope and scale of military exer cises, increase joint air and naval patrols in the Indo-Pacific region and potentially in areas closer to Russia, and increase cooperation in sensitive defense fields such as strategic mis sile defense, hypersonic technology, and nuclear submarine technology.47 Increased China Russia cooperation could also seek to undermine arms control treaties, and this might accel erate an arms race with the United States. If the U.S.-China competition were to turn hostile in the future, China and Russia could collaborate to support operations against the United States and its allies and partners along BRI routes. The two nations could be joined by others that have antagonistic relations with the United States, such as Iran and North Korea.48 The shift toward a multipolar international order raises the prospect of a more change able and unpredictable geopolitical contest in which coalitions shift and partnerships grow or recede in unexpected ways. In such a coalition, Russia could play an especially prominent role. The United States would likely retain friendly relations with powerful entities such as the European Union and Japan, although the degree of alignment may differ. China’s appeal as a patron state could grow under conditions in which it had neared global primacy, because it would be better positioned to provide benefits to other countries. A China enmeshed in a global rivalry with the United States would also be highly motivated to cultivate international support. Embattled governments around the world burdened with domestic difficulties or confronting bitter feuds with their own rival states could appeal to Chinese patronage for assistance. A key factor that could determine the extent of China’s network of clients would be how much each country judged Chinese assistance to be more valuable and meaningful than what the United States could offer. This scenario assumes that U.S. power continues to experi ence relative decline, to the point that its willingness or ability to furnish goods and benefits to its partners and allies had eroded considerably. In such a situation, some disillusioned U.S. allies and partners could decide to abandon their former patron in favor of a position of neutrality or even switch to a more lucrative Chinese patronage. Although countries might hope to remain neutral, autonomy could be difficult to sustain in the face of intense pres sure from Beijing and Washington, both of which could be expected to demand some level of support in exchange for material benefits of any type. In many ways, this dynamic would simply replicate a historical pattern featuring an acutely polarized international system, such as occurred in the World Wars and between the United States and Soviet Union in the Cold War. The pattern goes back to the 1700s and 1800s in Europe, where many smaller states aligned themselves with powerful great powers partly in hopes of securing the benefits of patronage. Indeed, studies have found that a rapid expansion in the number of alliances and partnerships tends to precede wars among great powers.49

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Elevated Risks from Regional and Global Competition

A turn toward hostile rivalry (see Chapter Five) could result in a heightened risk of conflict at both the regional level and beyond. Currently, Chinese and Western scholars tend to regard the risk of war among the great powers as still relatively low. A 2017 RAND report assessed the prospect of war between China and the United States as unlikely, though the study did note an uptick in conflict risks.50 Similarly, a commentary by Chinese media outlet CGTN rejected as improbable the possibility of U.S.-China war, though it regarded some sort of proxy clash as slightly less unlikely.51 At the regional level China seeks more sway over its neighboring regions and promotes an order in which U.S. influence does not dominate.52 Both countries have outlined competing visions for the Asia-Pacific’s emerging economic, political, and security order. They continue to face risks of a military crisis over flash points related to Taiwan and the East and South China Seas.53 Chinese leaders have denounced U.S. alliances and protested U.S. surveillance flights along Chinese borders, the U.S. Navy’s Freedom of Navigation Operations, and other activities.54 Feuding extends to the global level as well; for example, China and the United States have stepped up disputes regarding trade and technology.55 Since the 2010s, China has sought more significant revisions of global rules and norms, both alone and in conjunction with Russia.56 In June 2018 Xi identified “leading the reform of the global governance system with the concept of fairness and justice” as one of the ten priori ties for China’s diplomacy.57 In our scenario of Chinese near global primacy, the changes in the relative balance of power between China and the United States and their structural differences at both the regional and global levels are the most fundamental drivers of a systemic war.

Implications

These geopolitical trends provide the general outlines of the geopolitical environment within which a hostile U.S.-China rivalry might emerge. The future geopolitical situation could feature a more unstable international environment in which countries compete more aggressively for energy and other resources. A stronger China in partnership with Russia and other developing countries could face off against the United States and its allies and partners. A China nearing global primacy could have far greater international military presence and a larger group of military partners than it does today. Pervasive feuding at the regional and global levels raises the risk that conflict between China and the United States could spread beyond the Indo-Pacific to other regions around the world and in global domains including cyberspace and information technology. Table 2.1 shows the implications of key geopolitical factors for potential conflict.

[[table 2.1 omitted]]

[[paragraphs condensed]]

Military Trends Complementing our understanding of the geopolitical trends, analysis of anticipated devel opments in warfare could illuminate how China and the United States might fight under a situation of Chinese near primacy. These trends go beyond traditional comparisons of forces; instead they involve military changes that are expected in coming decades and that could profoundly shape U.S.-China confrontation and conflict. Thus, we review a protracted great power war, society as a domain of warfare, concealment and stealth, gray zone operations, outer space as a contested environment, and war from a distance. As much as possible, we include perspectives from both Chinese and Western sources. The Heightened Risk of a Protracted Great Power War Some Western scholars argue that future conflicts between great powers would focus on waging a limited war, because seeking victory through unconstrained warfare would lead to catastrophic destruction. Conflict between great powers could thus be protracted.58 As used by these experts, the term protracted war refers to a form of conflict characterized by long duration and limited means and ends. Such a conflict would aim to avoid the escalatory risks of direct conventional war in favor of indirect conflict that blurs the line between military and nonmilitary domains. The potential for a protracted great power war is further increased by other trends discussed in this chapter, including the intensification of geopolitical competi tion, conflict over scarce resources, and the resort to measures other than war to achieve secu rity goals. One study from the Center for a New American Security concludes that for future conflicts, limited protracted wars could include “peacetime preparation that is likely to blur with protracted, sometimes domestic, internal security operations, peacekeeping and coun terinsurgency or counterterror missions.” The study judges that “attacks will resemble raids” in that “armed forces will probably be deployed on the receipt of specific intelligence in highly mobile and exceptionally rapid operations.” These small-scale operations would address only local, immediate threats while leaving the broader struggle unresolved.59 This approach dif fers from that of many previous great power conflicts, in which countries mobilized large numbers of troops and equipment to decide wars through major combat engagements. Frederick Kagan has argued that protracted war increases the possibility that states will incorporate economic warfare into their strategies to exhaust the opponent and degrade their will to fight.60 His and other studies highlight the importance of economics in protracted war. Adversaries could seek to disrupt trade and logistics in the initial stages of conflict and could carry out blockade operations and commerce-raiding operations during the more advanced stages of conflict. Given the rise of global logistics chains and just-in-time inventory systems, even small disruptions in the velocity of trade could trigger large-scale economic challeng es.61 Although the risk of protracted conflict remains low in general, China’s growing mili tary capabilities, robust nuclear inventory, and economic clout increase the likelihood that any prospective U.S.-China conflict could resemble a protracted war, a possibility we explore in more detail in Chapter Six’s low-intensity conflict scenario. Chinese scholars acknowledge the possibility of a great power war between China and the United States but regard it as unlikely. While they do translate and discuss Western writ ings on protracted war, they have tended to downplay its relevance for China. A search for the term protracted war on Chinese academic study databases turns up a handful of recent articles that used the term in a metaphorical sense of long-term struggle. An article published in the military newspaper PLA Daily invokes Mao Zedong’s classic work Protracted War to suggest that China must adopt a new development pattern and avoid playing by rules set by the United States to advantage itself.62 Instead of seeing future war through the lens of pro tracted war, Chinese military analysts tend to focus on four different kinds of conflicts that they judge as more likely for the PLA: (1) a large-scale, high-intensity defensive war against a “hegemonic” country attempting to slow down or interrupt China’s rise; (2) a relatively large-scale, high-intensity anti-separatist war against Taiwan independence forces; (3) a medium- to small-scale and medium- to low-intensity conflict related to territorial disputes or Chinese near borders; or (4) small-scale, low-intensity operations intended to counter ter rorist attacks, preserve stability, and/or preserve the regime.63 The acknowledgment of large scale, high-intensity war against the United States is striking, but such sources do not explore the possibility in any depth, perhaps owing to political sensitivities. Instead these sources tend to refer to war in a general, abstract sense, unmoored from specific scenarios involving U.S. forces. Reflecting this tendency, the experts tend to emphasize the technological dimen sions of “future war,” such as AI and systems-of-systems warfare featuring information sys tems, long-range precision strikes, and advanced technologies. They do not discuss how the PLA would use these against U.S. forces in specific scenarios, however.64 Society as a Domain of Warfare Increasingly, warfare is no longer solely confined to the military. The intersection of multi ple emerging technologies, from surveillance technologies to AI, algorithms, machine learn ing, and virtual reality, is creating the potential for aggressors to disrupt and manipulate the information-based foundation of society. As a result, the barriers between military and civilian, and between peacetime and wartime endeavors and responsibilities, are blurring.65 The potential economic devastation that could accompany such war could deter adversaries from escalating to this level. If deterrence failed, conflict could be waged between and among networks, targeting and disrupting the whole of society, according to Western analysts. As Robert Johnson, an Oxford University specialist in the changing character of warfare, observes, “Future forces will make use of stealth, systemically operating through communi cations networks and through the exploitation of the vulnerabilities of society. They will use information warfare to spread fear and panic but also wage kinetic warfare on and among civilian populations. Their aim will be to destroy financial systems, infrastructure, and the willingness to sustain resistance.”66 China could also carry out information operations that target U.S. elections, political processes, and governmental institutions or that contribute to broader societal disruption and the shaping of U.S. public opinion.67 Chinese military analysts have written about society as a domain of warfare since the mid-2000s. Indeed, the concept is embedded within the PLA’s operational idea of informa tion dominance, which asserts that the side with the information advantage will win the war. The idea that cybertechnology and information operations can be used in wartime to target civilian infrastructure and shape an adversary’s societal thinking has been discussed in authoritative PLA sources since at least 2009.68 The PLA’s Three Warfares concept, a doctrine that calls for employing military assets to wage public opinion and psychological and legal warfare, illustrates the importance China places on seizing the information initiative and continuously shaping the narrative in both peacetime and wartime, including use of informa tion operations and propaganda campaigns to degrade adversary decisionmaking and mobilize support for China’s objectives.69 Developments consistent with this trend can already be observed in the activities of hack ers, activists, and informal propagandists being employed by China or Russia as part of their disinformation campaigns and cyber activities against the U.S. government and busi ness interests.70 Chinese export of surveillance technology around the globe further creates opportunity to disrupt information networks and collect data that can be used to shape information operations.71 As a result, any future conflict involving the PLA will almost cer tainly not remain within the military domain. In addition to the geographic expansion of U.S.-China competition given the geopolitical patterns discussed in Chapter One, the com petition, should it turn hostile, would likely broaden to include societal targets. Concealment, Stealth, and Proxy War Along with the information-based societal disruption and the challenges that related activi ties present, future conflicts appear poised to rely more on concealment or stealth. Accord ing to scholars who analyze patterns of conflict, methods of stealth and concealment include smaller organizations, as opposed to large armies, operating from other countries or attempt ing to remain concealed within populations or remote terrain. They also include “war by proxy,” where smaller groups and proxy actors assert the right to wage war, equipped with significant combat power. A technology trend, the “miniaturization of combat power,” enables smaller and more effective weapon systems with increased explosive power that can be carried by individuals. As Robert Johnson has observed, “The deduction of this trend is that every city, port and province is a potential battlespace.”72 The increase in the number of private security contractors and private military companies participating in security on behalf of states with interests overseas further illustrates this trend. Smaller, more dispersed, and well-armed groups make the conduct of proxy warfare easier, with nonmilitary or para military groups and individuals trained and equipped by both state and nonstate actors. An illustration of this trend may be seen in China’s increasing reliance on the paramili tary People’s Armed Police (PAP) to secure interests outside its borders, particularly in Cen tral Asia and along the borders with such countries as Afghanistan and Tajikistan.73 China is also hiring private security companies, both foreign and Chinese, to protect overseas facto ries and infrastructure projects in Africa and Central Asia.74 Furthermore, the use of proxy cybersecurity groups by China, including advanced persistent threat groups, many of which are contracted by the Chinese Ministry of State Security, is another means of concealment because these groups’ activities are often unattributable.75 These activities will continue and are even likely to increase as the U.S.-China competition tightens and China potentially expands its network of client states, particularly along the BRI. Gray Zone Operations The term gray zone operations refers to operations that seek to achieve military goals primarily through nonmilitary means or use coercion to achieve national objectives below the thresh old of war. Gray zone activities involve contractor, paramilitary, and proxy forces to coerce adversaries without provoking a military conflict. They also include nonkinetic means such as information warfare, economic coercion, or cybersecurity activities. Gray zone operations have become more common since the early 2010s. They are cheaper than conventional forms of conflict and carry lower risk of escalation, yet have proven remarkably successful: Iran has used these tools to advance its interests in the Middle East, and Russia has used them in Eastern Europe.76 In addition, countries are gaining a larger gray zone “toolbox,” including capabilities in emerging technologies such as AI-enabled cyberlearning, machine learning, and unmanned vehicles that can coerce and intimidate without the presence of military forces. Though they are below the threshold of war, these operations can increase regional instability and the risk of escalation through miscalculation. Gray zone operations have played a pivotal role in advancing China’s interests in the East and South China Seas, as they have been used to further strengthen Chinese administration of disputed waters, island features, and resources. They also serve to establish Chinese civil ian and military maritime presence as normal in the hope that the United States, regional nations, and the broader international community will accept China’s presence in disputed areas and hence its claims to those areas.77 While gray zone operations have occurred mainly in the maritime domain, they may provide a model of how China could pursue gray zone tactics on land—for example, in border disputes with India, where China has deployed a combination of military and civilian presence near or in disputed territory; gray zone forces include the People’s Armed Forces Maritime Militia and the paramilitary Chinese Coast Guard (CCG).78 Chinese literature also discusses use of AI and cybertechnology to enhance and shape information operations, which are used in gray zone conflicts.79 Given the relative success of gray zone operations in the Indo-Pacific region, China and the PLA will likely rely on gray zone actions and capabilities in future U.S.-China competition to support China’s objectives in other parts of the world and should conflict erupt. Cyberspace and Outer Space as Contested Environments Scholars also point to cyberspace and outer space as contested environments in conflicts over the coming decades.80 China and the United States already contend with each other in the cyber domains, and both sides have also built cyber-military units to defend their interests.81 While the United States has been the dominant player for decades in outer space through investments in intelligence, surveillance, and reconnaissance (ISR) and satellite capabilities, future U.S. dominance is threatened as China and Russia improve their counterspace ties (i.e., employment of weapons to degrade or destroy space assets). In addition, the private sector is increasingly exploiting outer space for commercial use, including launching micro satellites for imagery and communications purposes.82 This provides opportunities for other countries, including China, to capitalize on commercial technology—such as navigation and surveillance—that will improve the PLA’s global operations. China is actively investing in its military capabilities for outer space and cyberspace. The PLA has been modernizing its satellite communications infrastructure; space-based survey, mapping, and navigation systems; and an increasingly diverse range of space launch vehicles.83 China has a growing fleet of maritime surveillance satellites and dual-use oceanographic and hydrological satellites, as well as an expanding constellation of Beidou navigation satellites— all of which, Chinese scholars note, diminish China’s reliance on the U.S.-produced global positioning system. The Beidou constellation achieved global navigation coverage by 2020.84 These space-based capabilities are supported by infrastructure on the ground that ensures network connectivity, including spacecraft and space launch vehicle manufacture, launch, command and control, and data downlink.85 To address the increased vulnerability of space-based capabilities to attack, the PLA has also been developing counterspace capabilities, including an antisatellite capability that it tested in 2007 and 2014.86 An additional concern noted by Western experts discussing outer space as a contested warfighting domain is that China’s missile capabilities are undergirded by space-based surveillance and sensors that can work with over-the-horizon radars and other air- or ship-based sensors to find targets. Therefore, any future conflict involving China in which long-range missiles or hypersonic weapons come into play would likely spread to outer space.87 For any future low-intensity or proxy conflicts between the United States and China, space-based and navigational capabilities obtained from China by countries along the BRI digital Silk Road would augment the PLA’s command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) and navigational capabilities, as well as providing intelligence and data-gathering capabilities to Beijing.88 This would potentially extend China’s ability to conduct military operations or support proxy forces in a future U.S.-China conflict. Long-Range Precision-Guided Munitions Another military trend noted by experts is that developments in long-range precision strike and multiuse platforms enables countries to place forces at risk from vast distances. New generations of antimissile technology and semiautonomous vehicles have spurred develop ments in multiuse platforms that are able to operate on land, sea, air, and electronically.89 These enable an aggressor to conduct military operations without having to deploy forces close in, and it also increases the costs of response to the targeted country. China has made efforts to exploit this military trend through the diffusion of precision guided munitions (PGMs) and highly accurate extended-range delivery systems, such as bal listic and cruise missiles.90 These include hypersonic antiship cruise missiles, as well as a robust inventory of ballistic missiles, many of which can be adapted to use hypersonic war heads.91 The PLA also fields approximately 200–300 conventional medium-range ballistic missiles, which increase the range for precision strikes against land targets and naval ships operating out to and beyond the first island chain, and a series of nuclear and conventional intermediate-range ballistic missiles that are road-mobile and increase the capability for near-precision strike as far as the second island chain.92 Conceptually, PLA scholars discuss target-centric warfare as part of their operational systems concept, which uses precision strike capabilities and intelligent munitions to paralyze an enemy’s operational system while limiting nontarget collateral damage.93 Increased integration of PGMs and other long-range missiles into the PLA’s arsenal means that the Chinese military could feasibly target U.S. forces and sup porting client states from afar should the U.S.-China competition turn violent. However, the vulnerability of space-based and airborne ISR systems to both kinetic and nonkinetic strikes could mitigate, to some extent, the effectiveness of long-range strike capabilities.

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Implications

This section has examined future patterns of conflict and military developments that bear on the PLA’s approach to supporting Chinese primacy in the U.S.-China competition. These future patterns of conflict point to several common themes that are likely to affect such a competition. First, they will expand the competition, both geographically and into other domains, including outer space and society. Second, these developments point to a range of ways in which China can support proxy groups or client states through dispersion, concealment and stealth, gray zone operations, and the use of cybertechnology and other emerging technologies to cause societal upheaval. These possible scenarios in turn potentially increase the possibility of low-intensity or proxy conflicts in a U.S.-China competition. Table 2.2 summarizes these military developments and their implications for potential U.S.-China conflict.

[[table 2.2 omitted]]

Summary

This chapter has examined key geopolitical trends and patterns of conflict that are likely to affect the PLA’s support to Chinese primacy. Several implications arise from this discussion that will be discussed in the remainder of this report. First, the possibility of U.S.-China conflict owes in large part to broad historical trends related to the changing balance of power between China and the United States. To date, both countries have ensured that the competition remains peaceful. Although the current risk of conflict remains low, the possibility that tensions will escalate to hostilities cannot be fully discounted.

Second, the broad geopolitical drivers raise the possibility that should U.S.-China competition turn hostile, Chinese cooperation with Russia could become even closer. The rise of the East also points to the possibility that China will be able to broaden the competition to other geographic areas by expanding its network of supportive client states in the developing world—most likely along BRI routes. This in turn could increase the potential for military crises and incidents involving China and possibly the United States across a much broader geographic region than is the case today. China’s deepening energy dependence could also lead to an expansion of Chinese military presence in Africa and the Middle East, which could provide Beijing with military options should a U.S.-China conflict erupt.

The military trends discussed in this chapter carry important implications regarding the potential trajectory of U.S.-China conflict as well. The risks of escalation provide a strong incentive for the two great powers to resort to more indirect methods of fighting, including economic warfare, information operations, and cyberwarfare. The overlap of unsettled and disordered geographic regions with China’s pursuit of infrastructure development along the

BRI, the competition for resources, and an emerging mode of war featuring the blurring of military and society in conflict and the involvement of nonuniformed forces raise the prospect of low-intensity proxy wars. Improvements in space-based capabilities could allow China to field forces farther away and bolster its confidence to carry out combat operations abroad. The long ranges of advanced PGMs and the advent of new technologies suggest con flict could be waged at greater distances and also involve more dispersed forces.

[[paragraphs condensed]]

CHAPTER THREE Insights from the Wars of Past Global Leaders In a situation featuring Chinese near primacy, the possibilities of U.S.-China conflict could be dramatically different from what we regard as plausible today. What sort of conflicts might the two countries fight in such a hypothetical situation? Where might the conflicts occur? Would the two sides carry out the struggle through indirect means, or would the fighting be primarily conventional? One challenge in estimating how the Chinese military might seek to carry out conflict against the United States in a condition featuring a China nearing global primacy is that China is not today close to contending with the United States for such a status. We lack direct evidence of how China in a position of near global primacy might fight the United States. One potential source of data that could help us imagine this possibility lies in the experi ence of past great powers that achieved some form of international primacy. In this chapter we examine historical examples of leading great powers, focusing on the features of highest interest for our research purposes. After delineating relevant cases, we consider the geo graphic foundations of their international power, the principal methods that each country used to exert control, the reach and strength of their militaries, and the patterns of conflict experienced by each of the great powers. The observed patterns of past leading great powers could illuminate key aspects of potential U.S.-China conflict, including how China might seek to assert its primacy, where Beijing might be most willing to risk conflict, and what types of conflict China might be willing to wage against the United States. Which Are the Leading Great Powers? As presented in Chapter One, we define China’s pursuit of global primacy in terms that draw from both realist/hegemonic stability theory and systems leadership theory. Given their different definitions and points of emphasis, it should perhaps be unsurprising that the two schools of thought disagree on the historical list of great powers. Both groups agree only that the United Kingdom and the United States have reached the summit of global power.1 The consensus owes principally to the unusual degree of concentrated political, military, and economic power each has possessed. By contrast, scholars have not arrived at a consensus on the leading great powers for the preindustrial age, in part because countries rarely experienced such immense concentrations of national power. For example, some countries such as Portugal in the 1500s succeeded as mighty trading powers but lacked a powerful military and had far less political influence on the affairs of continental Europe than did rival land powers such as Spain. Similarly, the Hapsburg Empire in the 1600s may have been a dominant military power, but it lacked economic dynamism and could not com pete economically with the Dutch Republic and other vibrant trading nations.2 We will avoid the disputes over preindustrial great powers and instead base our analysis primarily on the cases of the United Kingdom and the United States. To these two undis puted examples, however, we will add a third great power for comparative purposes—the Soviet Union. The inclusion of the Soviet Union with global leaders such as the United King dom and the United States is not unproblematic. The Soviet Union lacked the concentration of comprehensive national power and global reach that the United Kingdom and the United States enjoyed, and its share of the global economy never reached more than a fraction of its chief rival, the United States. However, the Soviet Union’s formidable military arsenal, political influence, and substantial population do, by most criteria, meet the threshold for a great power. More relevant to our purposes, including the Soviet Union can be useful for analyzing China’s pursuit of global primacy. Prior to China’s ascent, the Soviet Union was the only great power to have been led by a communist party. Since China under Chi nese Communist Party (CCP) rule has frequently absorbed many lessons and imitated vari ous aspects of the Soviet Union, the experience of the Soviet Union it its prime could offer insights into China’s case. To facilitate analysis, we aim to more clearly define the periods of primacy experienced by the three countries. We define period of primacy as the time when the leading great power became the undisputed globally dominant power or, in the case of the Soviets, the undis puted Eurasian regional power. In the case of the United States and the United Kingdom, we measure this economically, by noting the years when the country in question had the single largest share of world GDP. The two nations saw their largest share of world GDP in the years 1945–1973 and 1815–1873, respectively. The United States outperformed the United Kingdom by some measure, as it was responsible for between 30 and 40 percent of world GDP at the height of its strength and GDP remained above 25 percent through 1973. Even in the 1990s and early 2000s, the United States retained an impressive 20 percent of world GDP by itself. By comparison, the United Kingdom at its height accounted for about 15 percent of world GDP.3 The Soviet Union’s economy performed relatively poorly compared with that of its Western competitors, never rising above 3 percent of world GDP. However, it dominated the economy of Eastern Europe as a regional power. At its height from the late 1940s through the mid-1970s, the Soviet Union experienced its highest rates of per capita GDP growth due to rapid capital accumulation.4 In comparison with these historical precedents, China has not arrived at a point of global primacy, despite decades of rapid growth. We tentatively mark the late 2030s as a hypo thetical period of Chinese near primacy, which assumes the country’s economy overtakes that of the United States. Some economists project that China could have the world’s largest economy by 2030 and that this share could continue to grow through 2050.5 Others reject this as implausible.6 Resolution of this issue lies beyond the scope of this report. For purposes of analysis, we will assume that the size of China’s GDP overtakes that of the United States in nominal terms in the late 2030s, although it continues to lag in terms of per capita GDP. We have no way of judging how long a hypothetical period of hegemony could last, although past precedents suggest a range between 30 and 60 years. We emphasize that these are merely planning assumptions, not predictions. Bookending each country’s period of primacy are phases of ascent and decline; each coun try in our sample shared a similar position in the international system relative to other coun tries. Periods of ascent are characterized by expanding economies and improving internal state capacity. Each of the countries had a minor share of world GDP, but that share grew relative to that of their competitors. According to such criteria, countries can be on the ascent for a very long time. To narrow the focus of analysis, we have selected periods of time when the international system featured multipolarity and there was no clear dominant power. For the United Kingdom, this corresponds roughly with the period 1763–1815, when numerous European powers vied for supremacy; for the United States it was 1873–1945. The Soviet Union’s phase of ascent in Eastern Europe may be marked from its formation in 1922 until the end of World War II. China overcame enormous difficulties stemming from civil war, foreign invasion, and economic disaster to establish the People’s Republic of China in 1949. However, the Maoist period saw uneven economic growth and considerable political disarray. By the early 1970s, China still remained one of the world’s poorest countries, but the turn toward market reforms in 1979 coincided with a dramatic increase in GDP growth, which averaged nearly 10 percent annually through early 2018.7 China’s international political and mili tary power lagged behind its economic strength through the 1980s and 1990s, but by the early 2000s its growing national power became clear; the era of U.S. unipolarity was near ing its end. For the purposes of our analysis, periods of decline can be defined as periods when new competition from rival states erodes the position of the leading great power. After all, no country remains supreme forever, though the duration of their respective tenures may vary considerably from one to another. In economic terms, a period of decline means that the leading global power no longer has the single largest share of world GDP or that its share had declined from the peak it enjoyed during its years of primacy. The United Kingdom’s share of global GDP declined after 1873, when it experienced greater competition from rivals, includ ing Germany and the United States. The United States saw its share of world GDP decline sig nificantly beginning in the 1970s. Although it retained the single largest economy for decades afterward, its position began to be more actively contested by China in the early 2000s.8 As a regional power, the Soviet Union’s economy stagnated in the late 1960s, and by the mid 1970s Moscow experienced a severe economic slowdown; this was followed by poor economic performance in the 1980s, which eventually led to the dissolution of the Soviet Union.9 Of course, since the period of Chinese hegemony is based on speculation, we have no way to judge when it might enter its period of decline. These definitions and time frames provide us with a sample of previous great powers with which we can now compare China and its prospects (see Table 3.1). The sample also provides some case studies for comparative analysis, which we will carry out in the follow ing section. [[table 3.1 omitted]] Key Features of Past Leading Great Powers Having identified our cases, we now compare them in terms of geographic foundations of primacy, methods of control, military reach and strength, and patterns of conflict. In this section we also consider how China’s case might compare with these precedents. Geographic Foundations Past leading great powers may have exerted influence across continents, but scholars of past empires have noted how the dominance of each was structured by specific geographic regions.10 The geographic regions most essential to sustaining a leading great power typi cally featured a dense network of trade, investment, security, and political relationships. The geographic regions most essential to the success of one global leader have generally differed from those of its predecessor. This is because rising powers tend to build their partnerships in countries that are less vital to the status quo power, due to the lower risks of provoking conflict with the leading power. The British Empire, for example, depended on a ribbon of territories through the center of Africa and the Middle East, a massive colony in South Asia, and several islands in the Caribbean and Pacific regions.11 The United Kingdom gradually assembled its empire through conquest, cultivation of client states, and other forms of state craft over the span of several centuries, with British power reaching its zenith in the mid- to late 1800s. Economically each of the geographic regions contributed vital trade resources and industry. The Caribbean furnished sugar, and India provided cotton and other manu factured goods and commodities. The United Kingdom also profited handsomely from trade in tea and exotic commodities from its outposts in China and the Pacific. To secure its over seas interests, it maintained colonies and supported client states with a modest expeditionary army augmented by native levies. It also maintained a robust navy to ensure secure sea lines of communication for its far-flung empire.12 By contrast, the geographic foundations for U.S. primacy lay in the Americas, western Europe, and East and Southeast Asia, with Japan being the most important Asian partner.13 Economically, the United States traded with these regions and built up industrial ties with western Europe, Japan, Latin America, and other Asian countries. With colonialism discred ited after World War II, the United States protected its interests in these regions through the formation of alliances: NATO in western Europe, the Central Treaty Organization (CENTO) in the Middle East, the Southeast Asia Treaty Organization (SEATO) in Southeast Asia, and bilateral alliances formed with countries such as Australia, Japan, the Philippines, South Korea, the Republic of China on Taiwan, and Thailand. The United States fielded a large military presence abroad in bases hosted by its allies, and naval dominance allowed it to ensure security for global commerce and energy supplies originating from the Middle East. But the United States also protected its interests through support for client states and occa sional smaller-scale military interventions, as it did in Latin America during the Cold War. The Soviet Union never reached the heights of global power exercised by the United King dom or the United States. However, it did achieve primacy across parts of Eurasia, and espe cially Eastern Europe and Central Asia. Moscow maintained friendly ties with a handful of communist nations in Asia, such as North Korea and Vietnam, and in Latin America. Economically the Soviet Union traded with its communist allies and partners through the Council for Mutual Economic Assistance.14 To protect its interests, Moscow formed an alli ance with satellite Eastern European states, the Warsaw Pact. The Soviet Union also provided military training, arms sales, and other forms of security assistance to communist partners and Moscow-aligned insurgencies across the developing world. China has not yet attained the summit of global leadership, but it has already made clear the geographic areas that it regards as most essential to its international position: Africa, the Caribbean, Central, South, and Southeast Asia, eastern and southern Europe, Latin Amer ica, and the Middle East are the principal areas designated as part of the BRI, which has largely coincided with the patterns in trade, investment, bilateral and multilateral collabora tion, and infrastructure development promoted by Beijing (see Table 3.2). Importantly, these are also areas that have tended not to be critical to U.S. power. Following the pattern set by the preceding cases, China has concentrated its build up of partnerships in areas neglected by the United States. An illustration of the importance placed on these geographic regions can be seen in China’s investment patterns. In the 1990s Beijing focused on areas largely neglected by the incumbent world leader and expanded its foreign directed investment in Southeast Asia and sub-Saharan Africa. However, Chinese foreign directed investment patterns diversified in the early 2000s to extend to Europe, Latin America, the Middle East, and the United States.15 These coun tries also experienced substantial increases in trade, reflecting their importance to China as sources of raw materials and technology and as markets for finished goods.16 China’s increas ing dependence on energy imports has reinforced the importance of these geographic regions. The 2000s have also seen a significant expansion of China’s partnerships for oil imports, much of which have involved Latin America, the Middle East, Russia, and coastal southwestern [[table 3.2 omitted]] Africa.17 China’s presence in these regions also extends to collaboration on a variety of issues, including manufacturing, production, research, infrastructure construction, among others.18 Indeed, Chinese officials have characterized “collaboration” as the “key” to the BRI Initiative, to distinguish it from the traditional trade and investment activities typically undertaken by countries everywhere.19 China shares with the United States extensive trade and investment ties with Europe and Japan, for example. China also maintains robust trade and invest ment ties with the United States. However, China’s involvement in the infrastructure develop ment, technological research and development, and manufacturing processes of the richest nations is limited. By contrast, China has sought to cultivate a closer cooperative relationship with its BRI partners. As Chinese involvement in relevant countries has deepened, China’s security interests have also increased. Beijing has focused on military diplomacy to bolster its security ties with its partners; relevant activities include arms sales, military training and exercises, senior leader visits, port calls, and other forms of security assistance, all of which have seen a dramatic increase in scale and scope since 2000, especially in countries along BRI routes.20 China has maintained a continuous naval presence in the Gulf of Aden to combat maritime piracy, and Beijing established its first overseas military base in Djibouti in 2017.21 Methods of Control Leading great powers stand apart from other wealthy, powerful countries in their ability to influence and determine events in other countries. By definition, countries that enjoy primacy have a greater ability to influence other countries than countries that do not. Thus they not only have power in the form of superior resources but also exhibit power over other countries to make them comply with their preferences to varying degrees. Compliance may be imper fect, and control may be weak, but there should be evidence that the preeminent power has the ability to either direct or influence the behavior of subordinate countries. Julian Go, a theorist in imperial formations, has distinguished between two forms of con trol. The first, formal control, consists of a relationship in which a great power directly con trols and administers a subordinate state, usually a colony.22 This tends to take the form of laws that delineate the inferior rights and obligations of the dependent state. Officials from the mother country also directly administer affairs in the subordinate state. By contrast, informal control relies on indirect methods that nominally respect the sovereignty of the dependent power. However, in practice, the leading great power relies on many instruments and tools to exercise influence. These may take the form of incentives offered through alli ances, bribes, blackmail, and intimidation. They may include support for coups, assassina tion, military invasions, and other actions to overthrow a recalcitrant regime and install a more compliant government. The degree of control under informal control varies greatly by situation and relationship and in general is considerably weaker than that exercised under formal control. Informal control offers its own advantages, however: It generally carries far less cost and risk to the leading great power since there is no need to maintain costly and politically contentious occupying armies; It is also more sustainable politically, since the sub ordinate country maintains the appearance of its sovereignty and independence. This latter point is especially important since the advent of the world decolonization movement, which has resulted in global norms against formal empire. The British Empire exercised both forms of control throughout its ascent, height of pri macy, and decline. It established colonies in Africa, India, North America, and elsewhere. However, it also maintained informal forms of control through protectorates, in which the United Kingdom acknowledged the sovereignty of the country and permitted local leaders to rule. In exchange, the protectorates provided military access and support to London. The United Kingdom also maintained clients in the Caribbean, the Middle East, Oceania, South east Asia, and sub-Saharan Africa. British authorities exercised control through a variety of methods, including offering financial aid and investment, arms sales, military assistance, and training, and occasionally through coercive acts including military demonstrations or even large-scale military interventions. The United States practiced a mix of formal and informal control in the early decades of its ascendance. It supported client states in Latin America in the late 1800s, for example, but also seized the Philippines as a colony from Spain in the Spanish-American War. How ever, after World War II, U.S. ascendancy coincided with an evolution in the international system premised on the rejection of colonialism. In a global order defined by nation-states, the United States supported national independence movements and then used techniques of informal control—such as financial, military, and advisory aid—to bolster friendly political regimes.23 During its early years, the Soviet Union engaged in war to conquer and annex provinces. After World War II, however, ideological opposition to colonialism and advocacy of national liberation, as well as a lack of accessible territory not “claimed” by other nations, discouraged Moscow from pursuing formal methods of control. From its period of regional primacy to its dissolution, the Soviet Union relied on informal methods of control. Moscow recognized the nominal autonomy of countries in the Eastern bloc, yet the reality of military occupation, economic dependence, and lack of autonomy on the part of the satellite communist states underscored the extent of Soviet domination. Moscow controlled the installation of sympa thetic leaders and ensured that the military and intelligence services of Eastern bloc countries were populated with individuals loyal to Moscow. When countries demonstrated too strident an opposition to Moscow’s preference, the Red Army invaded, as happened in Czechoslovakia in 1968. The Soviet Union thus exercised informal control of an unusually assertive variety. China shares with the Soviet Union an ideological opposition to colonialism, and it also lacks accessible territory not “claimed” by its neighboring nations. Unlike the Soviet Union, though, it rejects the principle of military alliances, which Moscow maintained with the Warsaw Pact. Accordingly, China has relied on informal techniques of control, includ ing offers of financial assistance, infrastructure investments, and various forms of security assistance, such as arms sales. Between 1999 and 2010 China went from having fewer than ten arms export partners to more than 20. From 2015 to 2019, China was the fifth largest exporter of arms.24 This expansion in the “harder” forms of militarism has been exceeded by an even more rapid expansion of “softer” forms of political and military engagement. Chinese economic developmental aid expanded rapidly, with the number of countries receiving some kind of developmental assistance nearly doubling, from 47 in 2000 to 93 in 2012.25 This same period is also marked by the PLA’s extensive engagement in military diplomacy. While sys tematic data on these activities are available only for the years after 2002, researchers see this level of activity with a large number of partner countries as marking a significant expansion in the PLA’s international engagement when compared with that of earlier decades.26 China has also stepped up the use of coercive instruments, including threats of economic sanctions, diplomatic retaliation, and—possibly—support for at least one coup.27 To date, these methods have yielded at most a modest bounty in terms of Chinese influ ence and control. Polls indicate that China’s efforts to win international backing have gen erally fallen short, especially in the developed West.28 Scholars have dismissed the pos sibility of Chinese international power by noting the enduring limitations of its appeal.29 But some of the limitations of Chinese influence can be explained by the fact that it remains a weaker country compared to the United States. China may be able to provide considerable economic assistance to countries, but it cannot provide the forms of diplomatic and mili tary assistance that the United States can with its broad network of partnerships, which is one of the main benefits of being the incumbent global leader. So long as the U.S. position seems secure, countries around the world have a strong incentive to favor U.S. over Chinese power. Much of this would change in our scenario since it features China nearing global pri macy. The collaboration currently underway in countries along BRI routes would in our hypothetical situation become more fruitful, resulting in a more substantial and persistent Chinese presence in the infrastructure, manufacturing, and technological development of its partner states, as well as in their diplomatic and political activities. Indeed, in our sce nario, the degree of collaboration would have advanced to such a degree that many of the states would become dependent on China, which would mark their transition from “part ners” with the autonomy to reject Chinese demands to “clients” that would be less able to reject the same demands. A more successful and wealthier China would be better positioned to offer a broader array of benefits to its clients, and it would be politically and militarily more capable of providing a competing, though not necessarily symmetrical, set of benefits to what the United States traditionally offered. Importantly, U.S. relative power would have waned, thereby eroding its ability to furnish benefits to its own allies and partners. In an era of fragmentation and disorder, governments disillusioned with Washington’s inability or unwillingness to provide substantial aid could either adopt a neutral stance or turn to Beijing as a patron. Even so, it is possible that in our scenario China does not achieve the level of international support enjoyed by the United States. Regarding countries on its periphery, China probably would not even exercise the type of tight control that Moscow held over the Eastern bloc. Chinese informal control could thus be considerably weaker than that seen in the other cases, with clients experiencing a higher degree of autonomy. One way China could mitigate the weaknesses of its control might be to generally support illiberal or authoritarian regimes that could suppress any popular discontent with pro-Chinese policies. Beijing might find this approach appealing as well due to its own political preferences. In short, Beijing in such a hypothetical future would rely primarily on informal control during its period of hegemony and as its primacy declined (see Table 3.3). [[table 3.3 omitted]] Military Reach and Strength In this section we briefly evaluate the structure of military power for the countries in our sample. In particular, we are interested in the ability of each country to employ its military force to uphold its international influence and leadership. A robust military capable of power pro jection is essential for protecting vital shipping lanes, defending clients, and deterring attacks against overseas national interests.30 To assess a country’s ability to project power abroad, we will examine the ability of a country to protect vital shipping lanes through naval power and the ability to fight threats to national interests abroad (see Table 3.4). In terms of naval power, we are interested in a country’s strength relative to rival nations. One way to measure this is to consider its share of major naval combatants during the period of primacy. If the share of a single country is over 50 percent of the global total, then the country may be said to have a globally predominant navy. By this standard, the United King dom had a globally predominant navy during the height of its primacy, from around 1820 through the late 1860s. The U.S. share of global power surpassed 50 percent from the end of World War II through the 1990s.31 The Soviet Union, by contrast, never achieved naval predominance. Reflecting its fundamental orientation as a Eurasian land power with little need to protect global shipping lanes, the Soviet military consisted primarily of a vast ground force, augmented by a modest navy that focused principally on submarine missions to deter the West and a surface fleet that sailed occasionally to Moscow’s clients in the developing world.32 China appears poised to develop in a direction somewhere between the Western and Soviet examples. Unlike the Soviets, China’s prosperity is much more dependent on access to the global economy; accordingly, Beijing has shown a much stronger interest in developing a robust navy. The PLA Navy has undergone a dramatic expansion in past decades, and since at least 2020 it has surpassed the U.S. Navy to become the largest navy in the world in terms [[table 3.4 omitted]] of the number of major naval vessels. Similar to the UK and U.S. precedents, the PLA Navy is building ships for long distance, oceangoing voyages, including aircraft carriers, cruis ers, and replenishment vessels.33 However, it is unclear if China can achieve a level of naval predominance experienced by its Western predecessors. China faces stiff competition from the U.S. Navy, as well as the substantial navies of India and Japan. Even decades from now, it seems doubtful that China will have achieved global predominance on the scale experienced by the United Kingdom and the United States.34 For leading great powers that seek to exert influence on military affairs around the world, possession of a powerful navy is a necessary, but insufficient, precondition. A global leader must also be able to deploy and sustain major combat forces in another continent for weeks, months, or longer. Both the United Kingdom and the United States demonstrated such a capability, with the former fielding expeditionary forces fighting wars as far away as Burma, China, and South Africa in the nineteenth century. The United States not only deployed vast armies to both the European and Pacific theaters in World War II but also fought major wars in Korea and Vietnam during the Cold War. The Soviet Union, by contrast, did not dem onstrate the capability to wage major combat operations on another continent. After World War II, the Soviet military supported client states with military advisers in Africa and other developing countries, and it projected major combat forces into neighboring countries, as it did in the Soviet-Afghan War. However, Moscow did not fight any major wars on other conti nents. China appears poised to evolve into a force somewhere between the Western examples and that of the Soviet Union.35 China has not fought a war beyond its periphery and currently lacks the capability to maintain major combat operations on another continent. But it has built its first overseas military base, in Djibouti, and it is significantly increasing its expeditionary capabilities. In addition to the growing naval fleet, it is expanding the PLA Navy Marine Corps to 100,000 personnel and is adding large transport aircraft.36 Chinese political and military thinkers have also expressed a clearer intent to field military forces abroad to protect the country’s growing array of interests when compared with what the Soviets could do.37 Yet even with the expanded capability, China will likely continue to field a far smaller expeditionary force than the United States possesses today, owing to a lack of allies, tighten ing budget constraints, and other factors.38 In terms of military might, China’s potential evolution as a leading power suggests a tra jectory between its Western precedents and that of the Soviet Union. China’s navy and power projection capability will very likely far surpass that of the Soviet Union but will likely fall short of what the United States and even the United Kingdom achieved at the height of their respect eras of primacy. Even so, the PLA’s anticipated global reach and expanded capabilities open possibilities for military operations beyond the reach of Soviet commanders. Patterns in Conflict In this section we analyze the types of conflict engaged in by leading great powers and how these have unfolded in their respective histories. We group the types of conflict by their char acteristics and then explore patterns of association between types of conflict and the phases of ascent, primacy, and decline for the sample countries. In terms of the types of conflict, international relations scholars have expended consid erable effort analyzing major wars between great powers. Scholars have noted, for example, that the ample resources of these states permit them to wage wars of unusually destructive magnitude.39 These wars are of high interest, in part because their outcomes can have a pro found impact on the direction of history. Napoleon Bonaparte’s defeat at Waterloo by Brit ain and its allies decisively closed the chapter on Europe’s domination by France. Similarly, the immense destruction of World War II shattered fascist power and opened the way for U.S. international leadership. But although great powers have faced formidable threats in their peer rivals, they also frequently coped with a broad range of other threats. The militaries of these leading great powers often undertook operations against insurgencies or against other minor powers. In some cases, conflicts may have involved an overlapping array of threats, such as insurgencies or a smaller country’s military backed by a rival great power. The leading great power may have supplied arms and equipment to an ally to fight a proxy war against the ally of a rival great power. Or the leading great power may have aided its ally in operations to crush insur gencies and nonstate armed groups that were in turn backed by a rival great power.

[[paragraphs uncondensed]]

For the purposes of our analysis, we will categorize military conflicts in three overarching categories, based on key characteristics. The first, systemic wars, consists of wars between rival great powers for the purpose of determining leadership in a global or regional political system. Intensely studied by scholars, these tend to feature conventional war between rival great power militaries. However, as the example of World War II showed, such wars could involve the use of nuclear weapons. The fear of nuclear exchange permeated the Cold War struggle for primacy between the Soviet Union and the United States. The advent of cyberweapons and space-based weapons further raises the specter of devastating strategic attacks in the event of an all-out struggle for supremacy among contenders for global powers. Another characteristic of systemic wars is that they tend to be multilateral affairs, involving large coalitions against one another. In such conflicts, the phenomenon of “war joining,” in which countries join one coalition or the other, is common. Countries war join partly in hopes of reaping rewards from supporting the victorious side. The outcome tends to result in a significant realignment of international affairs. Examples include the Napoleonic Wars and World Wars I and II.40

### 1AC---ADV: Exports

#### Contention 3 is Exports:

#### The US has controlled international protections of nuclear energy but is losing its edge---absent leadership they cede control to Russia and China whose unsafe practices allow non-state proliferation and coercive diplomacy

Carless 20 [Travis Carless; President’s Postdoctoral Fellow at Carnegie Mellon University. Stanton Nuclear Security Fellow at the RAND Corporation. Winter 2020, "The US Shouldn’t Abandon the Nuclear Energy Market", Issues in Science and Technology, https://issues.org/the-us-shouldnt-abandon-the-nuclear-energy-market/] \*[language modified]

As a pioneer in the nuclear power sector, the United States shaped the international regulatory regime that established norms and agreements to promote the peaceful use of nuclear energy. However, US competitiveness in the development and deployment of nuclear reactors within the commercial nuclear power sector is in decline, resulting in the erosion of its leadership in global nuclear safety and security. As a number of countries, including Germany, Belgium, Spain, and Switzerland, reconsidered their policy toward nuclear energy and planned the retirement of their entire nuclear fleet, an estimated 28 nations are making plans to add nuclear power to their energy portfolio. These nations view nuclear power as a way to increase their energy independence, address growing energy demands, and reduce greenhouse gas emissions. And with the US nuclear sector in retreat, these emerging markets now rely on Russia and China for advanced nuclear technology, training, and expertise, as well as favorable financial terms. This shift will likely create strategic disadvantages for the United States and its allies.

The US Senate recently reintroduced a bill aimed at spurring innovation and helping the United States reclaim its leadership position in the commercial nuclear energy sector. Through incentives and additional funding for the development of advanced reactors, the Nuclear Energy Leadership Act would create more certainty in the domestic market and support next-generation reactors able to compete with emerging technologies from Russia and China. In a hearing of the Senate Energy and Natural Resources Committee, Ashley Finan, executive director of the Nuclear Innovation Alliance, stated that “past participation in nuclear markets gave the United States leverage in influencing global nonproliferation, safety, and security norms; if we are not a major supplier, we cede that influence.” This shift from US-based reactor suppliers to those in Russia and China, in conjunction with a large-scale deployment of nuclear power plants in nations with very little experience with nuclear power, will lead to increased nuclear security and safety risks—both in those countries and on a global scale. How did we get here?

Rise of Russia and China

Between 1969 and 1990, 41% of the nuclear power reactors operating in the global nuclear fleet had been supplied by US-based vendors. Between 1991 and 2017, that number dropped to 8%, as interest in nuclear power began to wane in the United States because of the high capital costs and the increasing availability and affordability of natural gas. (See Figure 1.) Chinese and Russian vendors made up the difference and currently constitute a staggering two-thirds of all global reactor constructions. From 1991 to 2017, Russian vendors constructed 19 reactors for domestic and international markets. China still lags behind Russia in terms of reactor deployments to other nations, but Chinese vendors have connected 33 new nuclear power plants to its grid in the past 28 years and the nation is estimated to overtake the United States in deployed reactors in 20 years. China’s dramatic expansion in nuclear capacity and construction activity coupled with its ambitious Belt and Road Initiative shows that it is well positioned to supply other nations with reactors. Russia is constructing or has signed contracts with 11 countries to build nuclear power plants. China has built four reactors in Pakistan, and has announced an agreement to build a reactor in Argentina and an additional three in Pakistan. Currently, Russia and China are engaged in nuclear cooperation agreements with about 24 countries in Africa, the Middle East, South America, and Eastern Europe.

Emerging markets’ reliance on Russia and China for low-barrier, quick pathways to nuclear power can create several nuclear proliferation, safety, and strategic risks. Whereas the United States promotes a strong culture of nuclear security—for example, assembling a group of 40 nuclear experts from countries looking to adopt or expand nuclear capacity at the annual meeting of the Institute of Nuclear Materials Management in 2015—Russia and China have shown that they do not see value in these types of safety and security engagements. Their influence can therefore shift the attention of emerging markets away from the last area in which the United States still maintains some leadership. This will ultimately lead to future nuclear security and safety challenges in countries that may be among the most vulnerable in the event of an accident or security incident.

Nations that expand their nuclear capacity by working with US vendors are required to sign international nuclear safety agreements and adhere to additional safeguards as part of nuclear export controls outlined in the US Atomic Energy Act. But Russia seems willing to lower regulatory barriers to entry by not requiring host nations to sign some international nuclear safety agreements. Emerging markets relying on Russia and China incur their own national security risks as well. Many countries do not prioritize the threat of nuclear terrorism as part of their national security agenda, believing that nuclear terrorism is unlikely to happen within their borders. They also may implement inadequate security measures due to limited resources and weak regulatory structures. Emerging markets are vulnerable to regulatory capture: for example, if Russia drafts the nuclear regulations for a host nation that provide little domestic, independent oversight of safeguards and nuclear safety, it will have continual leverage over the host nation.

In Russia and China, nuclear vendors, engineering firms, and providers of fuel services are state-owned entities, which can offer favorable financial incentives, subsidies, and fuel services to host nations. China, for example, has lowered the financial barrier of entry by financing more than 80% of the cost of Pakistan’s reactors. Since 2006, Russia has implemented a $55 billion strategy aimed at becoming the largest global supplier of nuclear power. Currently, it strategically provides loan guarantees of between 49% and 90% of the total nuclear project cost, commits to taking back spent fuel, and relaxes certain regulatory safety and security requirements to mitigate costs for the host nation and to gain a competitive advantage in the global nuclear power arena. These incentives offered by Russian and Chinese firms mean that US-based firms will be unable to compete because they do not have the resources for similar financial incentives and are currently unable to produce more economically viable reactors.

A potential strategic risk also arises as countries that accept Russian or Chinese financing potentially subject themselves to so-called debt-trap diplomacy. If such countries are unable to repay debt on reactor projects, vendor nations can simply stop supplying, operating, or maintaining a reactor in order to gain leverage during a geopolitical crisis. In addition, the ability of the vendor nation to honor its agreement to take responsibility for used fuel for the life of the power plant is not guaranteed. If the vendor chooses not to honor the agreement, the host nation will be left scrambling to secure its spent nuclear fuel and find safe, long-term storage.

#### Nuclear terror is possible and risks extinction spirals through multiple vectors that overwhelm all defense

Hayes 18 [Peter Hayes; Director of the Nautilus Institute and Honorary Professor at the Centre for International Security Studies at the University of Sydney. Doctorate from University of California, Berkeley, 1-18-2018, "NON-STATE TERRORISM AND INADVERTENT NUCLEAR WAR", Nautilus Institute for Security and Sustainabilit., https://nautilus.org/napsnet/napsnet-special-reports/non-state-terrorism-and-inadvertent-nuclear-war/]

Catalytic nuclear attack

Catalytic nuclear attack is a metaphor for the possible malevolent third party who sets out to induce a nuclear war between two other nuclear weapons states. It is based on a metaphor drawn from chemistry whereby a catalyst increases the rate of chemical reaction without catalyst itself being destroyed. Tiny amounts of a catalyst often suffice to bring about such a transformative effect.

Such a “catalytic” nuclear attack between nuclear weapons states was a serious policy concern in the nineteen-fifties in the United States where strategists were seized of the notion that a “small” nuclear weapons state (for which read “China”) could start a nuclear war between the United States and the former Soviet Union (FSU). As articulated by the ubiquitous Herman Kahn, the concern was that the small “catalytic” state instigating the conflict would be the least damaged at the end of a nuclear war, and could increase its relative power by starting a war between other nuclear armed states that resulted in their catastrophic destruction. In his classic essay outlining this argument, Donald Kobe derived what he termed to be suspicion, retaliation, destruction, catalytic war utility, and casualty matrices for each country that defined outcomes for each state in a “catalytic nuclear war.”[2]

As China began to test its own nuclear weapons and the United States and the FSU began to anticipate its deployment in the sixties, the ability of the two nuclear superpowers, even at this relatively early stage in their rapidly growing nuclear forces, to overwhelmingly retaliate and damage the catalytic state soon allayed this concern. Nonetheless, the concept motivated these two nuclear armed states to strive for nuclear non-proliferation, in part driven by their mutual fear of state-sponsored nuclear terrorism should nuclear weapons and nuclear weapons technology and materials become freely available—a concern that persisted over the subsequent decades.[3]

As China began to test its own nuclear weapons and the United States and the FSU began to anticipate its deployment in the sixties, the ability of the two nuclear superpowers, even at this relatively early stage in their rapidly growing nuclear forces, to overwhelmingly retaliate and damage the catalytic state soon allayed this concern. Nonetheless, the concept motivated these two nuclear armed states to strive for nuclear non-proliferation, in part driven by their mutual fear of state-sponsored nuclear terrorism should nuclear weapons and nuclear weapons technology and materials become freely available—a concern that persisted over the subsequent decades.[3]

Is catalytic nuclear terrorism still a serious policy concern?

Today, the notion of “catalytic” nuclear war seems archaic in certain respects, and reflected a dismissive view at the time in the United States of the rationality of a state leadership armed with nuclear weapons and facing an overwhelming external adversary—in the case of China, not just one, but soon to be two external nuclear enemies that targeted its cities and nuclear forces. As China’s minimum deterrent posture evolved, and as its nuclear threat rhetoric subsided with the end of the Cultural Revolution, so the fear of catalytic nuclear war also receded. However, the fear of a catalytic nuclear war returned with a vengeance at the end of the Cold War when multiple states found themselves nuclear-armed almost overnight due to the collapse of the former Soviet Union, or proliferated independent nuclear forces in rapid succession in South Asia and in slow motion, North Korea.

In the United States and Russia, formal and informal discussion of the importance of avoiding war and nuclear war due to third party nuclear attack, by state or non-state actors, took place in diplomatic, military, and private channels, driven in part by the risk of nuclear “mega-terrorism” as the efforts of various insurgencies and global terrorist networks to acquire and use nuclear weapons came to light.

The first is that inadvertent nuclear war is possible, that is, the probability is greater than zero albeit unknowable. Multiple “threshold” events that could trigger inadvertent nuclear war are conceivable. In some unknowable combination, such drivers contribute to a probability greater than zero that nuclear war between states will occur, variously estimated at 0.1-1 percent year by strategic analysts—although there is no objective basis for such estimates, simply subjective estimates buttressed by the perception that specific near-nuclear wars punctuated the Cold War and post-Cold War decades, at which time the probability was perceived to be much higher for months at a time.

The second is that of all the drivers of inadvertent war, state-supported and non-state nuclear terrorism may be the least “directly controllable” by nuclear weapons states. Moreover, such nuclear terrorist attacks may coincide in the future with the influence of other drivers that could trigger rapid escalation to nuclear first use in conditions of complex nuclear confrontation involving two or more nuclear weapons states. Thus, the non-state terrorist driver of nuclear war may render “normal” positive and negative controls on nuclear use far less stabilizing than in the past when states were the sole concern in nuclear confrontations, depending on how a terrorist nuclear attack might affect the various contributing pathways to inadvertent nuclear war (listed in the next section).

The third is that such nuclear terrorist attacks may take many forms, as shown in Figure 1.

Figure 1: Types of Nuclear Terrorism from Least to Most Damaging

A close-up of a list of warning signs

AI-generated content may be incorrect.

Notes to Figure 1: a credible threat not accompanied by one or more actions to realize the threat is the least damage act of terrorism, and rests on the perception of those threatened as to the perpetrator’s intention and capability. Many nuclear terrorism threats are made. Relatively few are credible. The types below “mere” threats are characterized by actions which may (or may not) have been preceded by credible threats. “Footloose” here is shorthand for loss of control of legitimate and authorized control entity, public or private, that is subject to diversion and seizure by a non-state entity. Cyber attacks may be part of the types of nuclear terrorism because a competent terrorist entity will employ cyberattacks as part of a nuclear terrorist attack. However, a cyber attack that disables critical infrastructure at the same time as another type of direct nuclear terrorist attack is conducted would be highly damaging and if it results of itself in mass casualties, may enable and amplify the consequences of dirty bomb or an actual nuclear detonation. In this sense, a cyber attack may be a cyber-multiplier for other types of nuclear terrorism. Of course, a cyber attack aimed at mass casualties and terrorist effects may be undertaken without any form of nuclear terrorism associated with it. Finally, acquisition of radioactive materials or fissile material may occur via theft, purchase, or self-manufacture (the least likely and most difficult of the three acquisition pathways). Some may argue that radiological weapons (dirty bombs) are not nuclear at all in that they do not involve criticality at all, just the radioactive properties of the materials, and may be relatively crude and low technology. However, some nuclear weapons aim to achieve precisely such radiological effects on varying scales and long-term radiological effects, rather than blast and other direct irradiation of targeted humans. Dirty bombs and nuclear bombs exist on a spectrum and where competent, malevolent, and motivated non-state actors might position themselves on that spectrum remains an open question.

These many types of terrorist nuclear attack present states with starkly different potential damage, greater possible ambiguity or even opacity in terms of precursor indicators as well as identity of the perpetrator. Any of these types of attack may affect nuclear-armed states in unpredictable ways with respect to their own nuclear use decisions at times when inter-state conflict may be more or less likely. These various types of attack by non-state actors reduce into three basic categories of threat and use, as follows:

1. Credible threat of either nuclear detonation or radiological attack with possible massive damages

2. Actual or sub-critical nuclear detonation

3. Actual spent fuel or reactor attack with substantial radiological release.

In turn, such categories of terrorist attack might be realized in or against one or more types of targeted state, viz, a nuclear armed state, a nuclear umbrella state that receives nuclear extended deterrence from a nuclear armed state, or a non-nuclear weapons state which may or may not have nuclear fuel cycle facilities in and/or fissile material stored on its territory. (Thus, the target may or may not be a state, a state agency, or a state facility—it might be a civilian target such as a company or a religious entity; but in this paper, all terrorist nuclear attacks are assumed to take place only in places controlled by functioning states).

Nuclear terrorism post-cold war: trigger for inadvertent nuclear war?

The possible catalytic effect of nuclear terrorism on the risk of state-based nuclear war is not a simple linkage. The multiple types and scales of nuclear terrorism may affect state-nuclear use decisions along multiple pathways that lead to inadvertent nuclear war. These include:

Early warning systems fail or are “tripped” in ways that lead to launch-on-warning

Accidental nuclear detonation, including sub-critical explosions.

Strategic miscalculation in crisis, show of force

Decision-making failure (such as irrational, misperception, bias, degraded, group, and time-compressed decision-making)

Allied or enemy choices (to seek revenge, to exploit nuclear risk, to act out of desperation)

Organizational cybernetics whereby a nuclear command-control-and communications (NC3) system generates error, including the interplay of national NC3 systems in what may be termed the meta-NC3 system.

Synchronous and coincident combinations of above.[4]

Exactly how, where, and when nuclear terrorism may “ambush” nuclear armed states already heading for or on such a path to inadvertent nuclear war depends on who is targeting whom at a given time, either immediately due to high tension, or generally due to a structural conflict between states. Nuclear armed states today form a complex set of global threat relationships that are not distributed uniformly across the face of Earth. Rather, based on sheer firepower and reach, the nine nuclear weapons states form a global hierarchy with at least four tiers, viz:

Tier 1: United States, clear technological supremacy and qualitative edge.

Tier 2: Russia, China, global nuclear powers and peers with the United States due to the unique destructive power of even relatively small nuclear arsenals, combined with global reach of missile and bomber delivery systems, thereby constituting a two-tiered global “nuclear triangle” with the United States.

Tier 3: France, UK, NATO nuclear sharing and delivery NATO members (Belgium, Germany, Italy, the Netherlands and Turkey) and the NATO and Pacific nuclear umbrella states (Japan, South Korea, Australia) that depend on American nuclear extended deterrence and directly and indirectly support US and US-allied nuclear operations even though they do not host nor deliver nuclear weapons themselves.

Tier 4: India, Pakistan, Israel, DPRK.

The first two tiers constitute the global nuclear threat triangle that exists between the United States, Russia, and China, forming a global nuclear “truel.” Each of these states targets the others; each represents an existential threat to the other; and each has a long history of mutual nuclear threat that is now a core element of their strategic identity.

Tier three consists of states with their own nuclear force but integrated with that of the United States (even France!) that expand the zone of mutual nuclear threat over much of the northern and even parts of the southern hemisphere; and states that host American nuclear command, control, communications, and intelligence systems that support US nuclear operations and to whom nuclear deterrence is “extended” (if, for example, Australia’s claim to having an American nuclear umbrella is believed). The fourth tier is composed of smaller nuclear forces with a primarily regional reach and focus.

Between most of these nuclear armed states and across the tiers, there are few shared “rules of the road.” The more of these states that are engaged in a specific conflict and location, the more unpredictable and unstable this global nuclear threat system becomes, with the potential for cascading and concatenating effects. Indeed, as the number of nuclear states projecting nuclear threat against each other increases, the notion of strategic stability may lose all meaning.

The emergence of a fifth tier—of non-state actors with the capacity to project nuclear threat against nuclear-armed and nuclear umbrella states (although not only these states)—is a critically important possible catalytic actor in the new conditions of nuclear threat complexity that already exist today. Such a layer represents an “edge of chaos” where the attempts by nuclear armed states to exert absolute “vertical” control over the use of nuclear weapons confront the potential of non-state entities and even individuals (insiders) to engage in “horizontal” nuclear terrorism, presenting radically different control imperatives to the standard paradigm of organizational procedures, technical measures, and safeguards of various kinds. This tier is like the waves and tides on a beach that quickly surrounds and then causes sand castles to collapse.

In 2010, Robert Ayson reviewed the potential linkages between inter-state nuclear war and non-state terrorism. He concluded: “…[T]hese two nuclear worlds—a non-state actor nuclear attack and a catastrophic interstate nuclear exchange—are not necessarily separable. It is just possible that some sort of terrorist attack, and especially an act of nuclear terrorism, could precipitate a chain of events leading to a massive exchange of nuclear weapons between two or more of the states that possess them.”[5] How this linkage might unfold is the subject of the next sections of this essay.

Are non-state actors motivated and able to attempt nuclear terrorism?

A diverse set of non-state actors have engaged in terrorist activities—for which there is no simple or consensual definition. In 2011, there were more than 6,900 known extremist, terrorist and other organizations associated with guerrilla warfare, political violence, protest, organized crime and cyber-crime. Of these, about 120 terrorist and extremist groups had been blacklisted by the United Nations, the European Union and six major countries.[6]

Some have argued that the technical, organizational, and funding demanded for a successful nuclear attack, especially involving nuclear weapons, exceeds the capacity of most of the non-state actors with terrorist proclivities. Unfortunately, this assertion is not true, especially at lower levels of impact as shown in Figure 1; but even at the highest levels of obtaining authentic nuclear weapons capabilities, a small number of non-state actors already exhibit the motivation and possible capacity to become nuclear-armed.

Ellingsen suggests a useful distinction that nuclear terrorists may be impelled by two divergent motivations, as shown in Figure 2, creating “opportunistic” and “patient” profiles.[7] The requirements for an opportunist non-state nuclear terrorist tend towards immediate use and the search for short-term payoffs with only tactical levels of commitment; whereas the patient non-state nuclear terrorist is able and willing to sustain a long-term acquisition effort to deal a strategic blow to an adversary in a manner that could be achieved only with nuclear weapons.

Figure 2: Opportunist versus strategic nuclear terrorist motivation

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Source: S. Ellingsen, “Deliberations of a Nuclear Terrorist: Patience of Opportunism?” Defense & Security Analysis, 26:4, pp. 353-369 at: https://doi.org/10.1080/14751798.2010.534645

In turn, many factors will drive how a potential nuclear terrorist non-state organization that obtains nuclear weapons or materials may seek to employ them, especially in its nuclear command-and-control orientations.

Blair and Ackerman suggest that the goals, conditions, and capacity limitations that shape a possible nuclear terrorist’s posture lead logically to three types of nuclear terrorist nuclear command-and-control postures, viz: pre-determined (in which the leadership sends a fire order to a nuclear-armed subordinate and no change is entertained and no capacity to effect change is established in the field, that is, the order is fire-and-forget); assertive (in which only the central command can issue a nuclear fire order, central control is maintained at all times, with resulting demanding communications systems to support such control); and delegative (in which lower level commanders control nuclear weapons and have pre-delegated authority to use them in defined circumstances, for example, evidence of nuclear explosions combined with loss-of-connectivity with their central command).[8] An example of such delegative control system was the November 26, 2008 attack on Mumbai that used social media reporting to enable the attacking terrorists to respond to distant controller direction and to adapt to counter-terrorist attacks—a connectivity tactic that the authorities were too slow to shut down before mayhem was achieved.[9]

Logically, one might expect nuclear terrorists oriented toward short-term, tactical goals to employ pre-determined nuclear command-and-control strategies in the hope that the speed of attack and minimum field communications avoids discovery and interdiction before the attack is complete; whereas nuclear terrorists oriented toward long-term, strategic goals might employ more pre-delegative command-and-control systems that would support a bargaining use and therefore a field capacity to deploy nuclear weapons or materials that can calibrate actual attack based on communications with the central leadership with the risk of interdiction through surveillance and counter-attack. These differing strategic motivations, timelines, and strategies in many respects invert those of nuclear weapons states that rely on large organizations, procedures, and technical controls, to ensure that nuclear weapons are never used without legitimate authorization; and if they are used, to minimize needless civilian casualties (at least some nuclear armed states aspire to this outcome). The repertoire of state-based practices that presents other states with credible nuclear threat and reassures them that nuclear weapons are secure and controlled is likely to be completely mismatched with the strengths and strategies of non-state nuclear terrorists that may seek to maximize civilian terror, are not always concerned about their own survival or even that of their families and communities-of-origin, and may be willing to take extraordinary risk combined with creativity to exploit the opportunities for attack presented by nuclear weapons, umbrella, and non-nuclear states, or their private adversaries.

For non-state actors to succeed at complex engineering project such as acquiring a nuclear weapons or nuclear threat capacity demands substantial effort. Gary Ackerman specifies that to have a chance of succeeding, non-state actors with nuclear weapons aspirations must be able to demonstrate that they control substantial resources, have a safe haven in which to conduct research and development, have their own or procured expertise, are able to learn from failing and have the stamina and strategic commitment to do so, and manifest long-term planning and ability to make rational choices on decadal timelines. He identified five such violent non-state actors who already conducted such engineering projects (see Figure 3), and also noted the important facilitating condition of a global network of expertize and hardware. Thus, although the skill, financial, and materiel requirements of a non-state nuclear weapons project present a high bar, they are certainly reachable.

Figure 3: Complex engineering projects by five violent non-state actors & Khan network

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Source: G. Ackerman, “Comparative Analysis of VNSA Complex Engineering Efforts,” Journal of Strategic Security, 9:1, 2016, at: http://scholarcommons.usf.edu/jss/vol9/iss1/10/

Along similar lines, James Forest examined the extent to which non-state actors can pose a threat of nuclear terrorism.[10] He notes that such entities face practical constraints, including expense, the obstacles to stealing many essential elements for nuclear weapons, the risk of discovery, and the difficulties of constructing and concealing such weapons. He also recognizes the strategic constraints that work against obtaining nuclear weapons, including a cost-benefit analysis, possible de-legitimation that might follow from perceived genocidal intent or use, and the primacy of political-ideological objectives over long-term projects that might lead to the group’s elimination, the availability of cheaper and more effective alternatives that would be foregone by pursuit of nuclear weapons, and the risk of failure and/or discovery before successful acquisition and use occurs. In the past, almost all—but not all—non-state terrorist groups appeared to be restrained by a combination of high practical and strategic constraints, plus their own cost-benefit analysis of the opportunity costs of pursuing nuclear weapons. However, should some or all of these constraints diminish, a rapid non-state nuclear proliferation is possible.

Although only a few non-state actors such as Al Qaeda and Islamic State have exhibited such underlying stamina and organizational capacities and actually attempted to obtain nuclear weapons-related skills, hardware, and materials, the past is not prologue. An incredibly diverse set of variously motivated terrorist groups exist already, including politico-ideological, apocalyptic-millenarian, politico-religious, nationalist-separatist, ecological, and political-insurgency entities, some of which converge with criminal-military and criminal-scientist (profit based) networks; but also pyscho-pathological mass killing cults, lone wolves, and ephemeral copy-cat non-state actors. The social, economic, and deculturating conditions that generate such entities are likely to persist and even expand.

In particular, rapidly growing coastal mega-cities as part of rapid global urbanization offer such actors the ability to sustain themselves as “flow gatekeepers,” possibly in alliance with global criminal networks, thereby supplanting the highland origins of many of today’s non-state violent actors with global reach.[11] Other contributing factors contributing to the supply of possible non-state actors seeking nuclear weapons include new entries such as city states in search of new security strategies, megacities creating their own transnationally active security forces, non-states with partial or complete territorial control such as Taiwan and various micro-states, failing states, provinces in dissociating, failing states that fall victim to internal chaos and the displacement effects of untrammeled globalization, and altogether failed states resulting in ungoverned spaces. To this must be added domestic terrorist entities in the advanced industrial states as they hollow out their economies due to economic globalization and restructuring, adjust to cross-border migration, and adapt to cultural and political dislocation.

In short, the prognosis is for the fifth tier of non-state actors to beset the other four tiers with intense turbulence just as waves on a beach swirl around sandcastles, washing away their foundations, causing grains of sand to cascade, and eventually collapsing the whole structure.

Observed non-state nuclear threats and attacks

In light of the constraints faced by non-state terrorist actors in past decades, it is not surprising that the constellation of actual nuclear terrorist attacks and threats has been relatively limited during and since the end of the Cold War. As Martha Crenshaw noted in a comment on the draft of this paper:

We still don’t know why terrorists (in the sense of non-state actors) have not moved into the CBRN [chemical,biological, radiological or nuclear] domain. (Many people think biosecurity is more critical, for that matter.) Such a move would be extremely risky for the terrorist actor, even if the group possessed both capability (resources, secure space, time, patience) and motivation (willingness to expend the effort, considering opportunity costs). So far it appears that “conventional” terrorism serves their purposes well enough. Most of what we have seen is rhetoric, with some scattered and not always energetic initiatives.[12]

Nonetheless, those that have occurred demonstrate unambiguously that such threats and attacks are not merely hypothetical, in spite of the limiting conditions outlined above. One survey documented eighty actual, planned attacks on nuclear facilities containing nuclear materials between 1961-2016[13] as follows:

80 attacks in 3 waves (1970s armed assaults, 1990s thefts, post-2010, breaches)

High threat attacks: 32/80 attacks posed substantial, verified threat of which 44 percent involved insiders.

All types of targets were found in the data set—on reactors, other nuclear facilities, military bases leading Gary Ackerman and to conclude: “Overall, empirical evidence suggests that there are sufficient cases in each of the listed categories that no type of threat can be ignored.”[14]

No region was immune; no year was without such a threat or attack. Thus, there is a likely to be a coincidence of future non-state threats and attacks with inter-state nuclear-prone conflicts, as in the past, and possibly more so given the current trend in and the generative conditions for global terrorist activity that will likely pertain in the coming decades.

Of these attacks, about a quarter each were ethno-nationalist, secular utopian, or unknown in motivation; and the remaining quarter were a motley mix of religious (11 percent), “other” (5 percent), personal-idiosyncratic (4 percent), single issue (2 percent) and state sponsored (1 percent) in motivation.

The conclusion is unavoidable that there a non-state nuclear terrorist attack in the Northeast Asia region is possible. The following sections outline the possible situations in which nuclear terrorist attacks might be implicated as a trigger to interstate conflict, and even nuclear war. Particular attention is paid to the how nuclear command, control and communications systems may play an independent and unanticipated role in leading to inadvertent nuclear war, separate to the contributors to inadvertency normally included such as degradation of decision-making due to time and other pressures; accident; “wetware” (human failures), software or hardware failures; and misinterpretation of intended or unintended signals from an adversary.

Regional pathways to interstate nuclear war

At least five distinct nuclear-prone axes of conflict are evident in Northeast Asia. These are:

US-DPRK conflict (including with United States, US allies Japan, South Korea and Australia; and all other UNC command allies. Many permutations possible ranging from non-violent collapse to implosion and civil war, inter-Korean war, slow humanitarian crisis. Of these implosion-civil war in the DPRK may be the most dangerous, followed closely by an altercation at the Joint Security Area at Panmunjon where US, ROK, and DPRK soldiers interact constantly.

China-Taiwan conflict, whereby China may use nuclear weapons to overcome US forces operating in the West Pacific, either at sea, or based on US (Guam, Alaska) or US allied territory in the ROK, Japan, the Philippines, or Australia); or US uses nuclear weapons in response to Chinese attack on Taiwan.

China-Japan conflict escalates via attacks on early warning systems, for example, underwater hydrophone systems (Ayson-Ball, 2011).

China-Russia conflict, possibly in context of loss-of-control of Chinese nuclear forces in a regional conflict involving Taiwan or North Korea.

Russia-US conflict, involving horizontal escalation from a head-on collision with Russian nuclear forces in Europe or the Middle East; or somehow starts at sea (mostly likely seems ASW) or over North Korea (some have cited risk of US missile defenses against North Korean attack as risking Russian immediate response).

Combinations of or simultaneous eruption of the above conflicts that culminate in nuclear war are also possible. Other unanticipated nuclear-prone conflict axes (such as Russia-Japan) could also emerge with little warning.

Precursors of such nuclear-laden conflicts in this region also exist that could lead states to the brink of nuclear war and demonstrate that nuclear war is all too possible between states in this region. Examples include the August 1958 Quemoy-Matsu crisis, in which the United States deployed nuclear weapons to Taiwan, and the US Air Force has only a nuclear defense strategy in place to defend Taiwan should China have escalated its shelling campaign to an actual attack; the October 1962 Cuban Missile Crisis, when a US nuclear armed missile was nearly fired from Okinawa due to a false fire order; the March 1969 Chinese-Soviet military clash and resulting consideration of nuclear attacks by both sides; and the August 1976 poplar tree crisis at Panmunjon in Korea, when the United States moved nuclear weapons back to the DMZ and the White House issued pre-delegated orders to the US commander in Korea to attack North Korea if the tree cutting task force was attacked by North Korean forces.

Loss-of-control of Nuclear Weapons

As is well known, nuclear armed states must routinely—and in the midst of a crisis—ensure that their nuclear weapons are never used without legitimate authority, but also ensure at the same time that they are always available for immediate use with legitimate authority. This “always-never” paradox is managed in part by a set of negative and positive controls, reliant upon procedural and technical measures, to maintain legitimate state-based command-and-control (see Figure Four).

A close-up of a paper

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Source: Virginia Tech Applied Research Corporation, Nuclear Command, Control, and Stability Framework, December 29, 2016, at: https://calhoun.nps.edu/bitstream/handle/10945/48707/Nuclear%20Command%20Control%20and%20Stability%20Assessment\_Final%20report\_29Dec15%20rev2.pdf?sequence=1&isAllowed=y

In this framework, Jerry Conley has produced a taxonomy of nuclear command-and-control structures that embody varying notional national “command-and-control” orientations (also referred to as stability points or biases). Each nuclear armed state exhibits a distinct preference for technical and procedural measures to achieve negative and positive control of nuclear weapons. The way that a state constructs its control system varies depending on its size, wealth, technology, leadership, and strategic orientation, lending each state a unique use propensity affected by the information processing and transmission functions of the nuclear command-and-control system, that in part determines the use or non-use decisions made by the leaders of nuclear armed states. The resulting ideal nuclear command-and-control state structures are shown in Table 1.

Table 1: Ideal Nuclear command-and-control structures

[TABLE REMOVED]

Source: Virginia Tech Applied Research Corporation, Nuclear Command, Control, and Stability Framework, December 29, 2016, at: https://calhoun.nps.edu/bitstream/handle/10945/48707/Nuclear%20Command%20Control%20and%20Stability%20Assessment\_Final%20report\_29Dec15%20rev2.pdf?sequence=1&isAllowed=y

A diagram of a complex structure

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Note: according to dominant characteristic shown in orange circle; also, real states may exhibit more than one characteristic

Source: Virginia Tech Applied Research Corporation, Nuclear Command, Control, and Stability Framework, December 29, 2016, at: https://calhoun.nps.edu/bitstream/handle/10945/48707/Nuclear%20Command%20Control%20and%20Stability%20Assessment\_Final%20report\_29Dec15%20rev2.pdf?sequence=1&isAllowed=y

In Northeast Asia, a four-way nuclear threat system exists that has a three world-class nuclear armed states, the United States, Russia and China, interacting with a fourth tier, barely nuclear armed state, the DPRK. In this quadrilateral nuclear standoff, the DPRK’s simple NC3 system likely is an amalgam of a poorly resourced, militarized, and personalized leadership—which may lead it to oscillate between procedural and technical measures as the basis of control, with a primary emphasis on positive use control, not negative control to avoid unauthorized use. China’s large, centralized NC3 system co-mingles nuclear and conventional communications between national commanders and deployed nuclear forces and may emphasize negative more than positive use controls to ensure Party control. Russia’s highly centralized, complex NC3 system relies on legacy technology and limited economic base for modernization. It too may be more oriented towards negative controls in peacetime, but have the capacity to spring almost instantly to primary reliance on positive controls in times of crisis or tension. The US NC3 system is large, complex and based on wealth and technological prowess. It is under civilian, not military control, at least in principle and in peacetime, and is redundant, diverse, and relatively resilient.

Non-state nuclear attack as trigger of inter-state nuclear war in Northeast Asia

The critical issue is how a nuclear terrorist attack may “catalyze” inter-state nuclear war, especially the NC3 systems that inform and partly determine how leaders respond to nuclear threat. Current conditions in Northeast Asia suggest that multiple precursory conditions for nuclear terrorism already exist or exist in nascent form. In Japan, for example, low-level, individual, terroristic violence with nuclear materials, against nuclear facilities, is real. In all countries of the region, the risk of diversion of nuclear material is real, although the risk is likely higher due to volume and laxity of security in some countries of the region than in others. In all countries, the risk of an insider “sleeper” threat is real in security and nuclear agencies, and such insiders already operated in actual terrorist organizations. Insider corruption is also observable in nuclear fuel cycle agencies in all countries of the region. The threat of extortion to induce insider cooperation is also real in all countries. The possibility of a cult attempting to build and buy nuclear weapons is real and has already occurred in the region.[15] Cyber-terrorism against nuclear reactors is real and such attacks have already taken place in South Korea (although it remains difficult to attribute the source of the attacks with certainty). The stand-off ballistic and drone threat to nuclear weapons and fuel cycle facilities is real in the region, including from non-state actors, some of whom have already adopted and used such technology almost instantly from when it becomes accessible (for example, drones).[16]

Two other broad risk factors are also present in the region. The social and political conditions for extreme ethnic and xenophobic nationalism are emerging in China, Korea, Japan, and Russia. Although there has been no risk of attack on or loss of control over nuclear weapons since their removal from Japan in 1972 and from South Korea in 1991, this risk continues to exist in North Korea, China, and Russia, and to the extent that they are deployed on aircraft and ships of these and other nuclear weapons states (including submarines) deployed in the region’s high seas, also outside their territorial borders.

The most conducive circumstance for catalysis to occur due to a nuclear terrorist attack might involve the following nexi of timing and conditions:

1. Low-level, tactical, or random individual terrorist attacks for whatever reasons, even assassination of national leaders, up to and including dirty radiological bomb attacks, that overlap with inter-state crisis dynamics in ways that affect state decisions to threaten with or to use nuclear weapons. This might be undertaken by an opportunist nuclear terrorist entity in search of rapid and high political impact.

2. Attacks on major national or international events in each country to maximize terror and to de-legitimate national leaders and whole governments. In Japan, for example, more than ten heads of state and senior ministerial international meetings are held each year. For the strategic nuclear terrorist, patiently acquiring higher level nuclear threat capabilities for such attacks and then staging them to maximum effect could accrue strategic gains.

3. Attacks or threatened attacks, including deception and disguised attacks, will have maximum leverage when nuclear-armed states are near or on the brink of war or during a national crisis (such as Fukushima), when intelligence agencies, national leaders, facility operators, surveillance and policing agencies, and first responders are already maximally committed and over-extended.

At this point, we note an important caveat to the original concept of catalytic nuclear war as it might pertain to nuclear terrorist threats or attacks. Although an attack might be disguised so that it is attributed to a nuclear-armed state, or a ruse might be undertaken to threaten such attacks by deception, in reality a catalytic strike by a nuclear weapons state in conditions of mutual vulnerability to nuclear retaliation for such a strike from other nuclear armed states would be highly irrational.

Accordingly, the effect of nuclear terrorism involving a nuclear detonation or major radiological release may not of itself be catalytic of nuclear war—at least not intentionally–because it will not lead directly to the destruction of a targeted nuclear-armed state. Rather, it may be catalytic of non-nuclear war between states, especially if the non-state actor turns out to be aligned with or sponsored by a state (in many Japanese minds, the natural candidate for the perpetrator of such an attack is the pro-North Korean General Association of Korean Residents, often called Chosen Soren, which represents many of the otherwise stateless Koreans who were born and live in Japan) and a further sequence of coincident events is necessary to drive escalation to the point of nuclear first use by a state. Also, the catalyst—the non-state actor–is almost assured of discovery and destruction either during the attack itself (if it takes the form of a nuclear suicide attack then self-immolation is assured) or as a result of a search-and-destroy campaign from the targeted state (unless the targeted government is annihilated by the initial terrorist nuclear attack).

It follows that the effects of a non-state nuclear attack may be characterized better as a trigger effect, bringing about a cascade of nuclear use decisions within NC3 systems that shift each state increasingly away from nuclear non-use and increasingly towards nuclear use by releasing negative controls and enhancing positive controls in multiple action-reaction escalation spirals (depending on how many nuclear armed states are party to an inter-state conflict that is already underway at the time of the non-state nuclear attack); and/or by inducing concatenating nuclear attacks across geographically proximate nuclear weapons forces of states already caught in the crossfire of nuclear threat or attacks of their own making before a nuclear terrorist attack.[17]

An example of a cascading effect would be a non-state attack on a key node of linked early warning systems that is unique to and critical for strategic nuclear forces to be employable, or the effect of multiple, coincident and erroneous sensor alerts of incoming attacks (as occurred during the Cuban Missile Crisis with radar in Florida monitoring Soviet missiles in Cuba that mistakenly fused an erroneous reading of a missile trajectory with a real observation of a Soviet satellite that happened to be passing overhead).

An example of a concatenating effect would an attack that leads a nuclear weapons state to target two other states forces because it cannot determine whose forces attacked its own. This circumstance might arise if key anti-submarine forces or an aircraft carrier battle group were attacked and it was impossible to determine in a given waterway or area of ocean whose submarines were present or responsible for the attack, leading the attacked state to destroy all the submarines presenting on-going threat to its strategic forces.

As we noted above, a terrorist nuclear shock may take various forms and appear in different places. Ever since an extortion attempt in Boston in 1974 based on the threat of nuclear detonation, the threat of an improvised nuclear device has been credible. For such a threat to be credible, a non-state terrorist entity must release a plausible precursor such as nuclear material or warhead design information, or stage an actual demonstration attack that makes it plausible that the attacker controls a significant quantity of fissile material (most likely plutonium, or simply radioactive materials suitable for a radiological device that might be used to draw in first responders and then detonate a warhead to maximize damage and terror). Such an attack might be combined with a separate attack on critical infrastructure such as a cyberattack. The attacker might retain sufficient material for bargaining and insurance should the initial attack fail. Given the need to adapt to circumstances, such an attacker is likely to be patient and strategic, in the terms defined earlier, and to have extensive organizational and communication capacities; and to be able to operate at multiple targeted sites, possibly in multiple countries. Given its patience and stamina, such an attacker would select a highly symbolic target such as a high level meeting. Such a case would present the targeted state with an exquisite dilemma: bargaining and negotiation with the non-state actor threatening such an attack may be justified given the explicit and plausible nature of the threat, which may be politically impossible while making counter-terrorism operations very risky and only possible with extreme caution. And, such an attacker might well issue a false statement about state-sponsorship to invoke third parties in ways that vastly complicate the response to the threat.

If the attacker is less capable and driven for immediate political or other returns, then it may be satisfied with highly delegated delivery with no recall option, and no use of communications to minimize the risk of discovery or interdiction. Such an attacker is also less likely to wait for the circumstances in which inter-state nuclear war is more likely due to inter-state tension; and also less likely to seek third party effects beyond the damage to the immediate target and resulting terror. Should surveillance indicate that an improvised nuclear device is in motion, then an all-out search to interdict the attackers and to retrieve the device or materials would likely ensue.

In these two instances of credible threat of non-state nuclear attack, the insider versus outsider perpetrator factor will affect significantly how the attack affects possible inter-state conflicts. In Kobe’s terms, if the perpetrator is confirmed to be an outsider, then a country-of-origin suspicion matrix may cast suspicion onto another state as possible sponsor. For an attack threatened in China, the linkage might be back to Russia, the United States, or North Korea. For an attack threatened in Russia, the linkage might be back to the United States, China, or North Korea. For an attack threatened in North Korea, the linkage might be back to the United States, China, or Russia. And for an attack threatened in one of the umbrella states in the region, South Korea and Japan, such an attack might be linked to each other, as well as to China, North Korea, or Russia. In each case, the shadow of suspicion and possible accusations could tilt decision-making processes in one or more of these states and ways that could worsen pre-existing views about the nuclear use propensity of an opposing nuclear armed state.

Should an actual nuclear attack occur, the situation is even more complex and problematic. Such an attack might be purely accidental, due to hardware, software, or human error while nuclear materials or weapons are in transit. In principle, this limits the site of such an event to the nuclear weapons states or their ships and aircraft as neither South Korea nor Japan host nuclear weapons today. If an insider is involved, then the perpetrator may be identified quickly, and whether there is a linkage with another state may become evident (depending on nuclear forensics as well as insight obtained from surviving attackers).

If an outsider is the perpetrator, then the suspicion matrix will come into play again, with possibly severe effects on inter-state tension due to accusation, suspicion, and fear of follow-on attacks. During the attack, especially if it is a hostage-taking type of attack, the identity of the perpetrator may be unknown or ambiguous, and maintaining this ambiguity or even opacity as to the attacker may be deliberate—as was the case with the 2008 Mumbai attack in which the controller tried to ensure that all the attackers were killed in the course of the twelve separate but coordinated attacks across the city over four days. Although much progress has been made in establishing local nuclear forensics capability in Japan,[18] China, and South Korea, there is no certainty that it is sufficiently developed to identify the perpetrator of an act of nuclear terrorism, especially if there is a state sponsor and deception involved.

Conclusion

We now move to our conclusion. Nuclear-armed states can place themselves on the edge of nuclear war by a combination of threatening force deployments and threat rhetoric. Statements by US and North Korea’s leaders and supporting amplification by state and private media to present just such a lethal combination. Many observers have observed that the risk of war and nuclear war, in Korea and globally, have increased in the last few years—although no-one can say with authority by how much and exactly for what reasons.

However, states are restrained in their actual decisions to escalate to conflict and/or nuclear war by conventional deterrence, vital national interests, and other institutional and political restraints, both domestic and international. It is not easy, in the real world, or even in fiction, to start nuclear wars.[19] Rhetorical threats are standard fare in realist and constructivist accounts of inter-state nuclear deterrence, compellence, and reassurance, and are not cause for alarm per se. States will manage the risk in each of the threat relationships with other nuclear armed states to stay back from the brink, let alone go over it, as they have in the past.

This argument was powerful and to many, persuasive during the Cold War although it does not deny the hair-raising risks taken by nuclear armed states during this period. Today, the multi-polarity of nine nuclear weapons states interacting in a four-tiered nuclear threat system means that the practice of sustaining nuclear threat and preparing for nuclear war is no longer merely complicated, but is now enormously complex in ways that may exceed the capacity of some and perhaps all states to manage, even without the emergence of a fifth tier of non-state actors to add further unpredictability to how this system works in practice.

The possibility that non-state actors may attack without advance warning as to the time, place, and angle of attack presents another layer of uncertainty to this complexity as to how inter-state nuclear war may break out. That is, non-state actors with nuclear weapons or threat goals and capacities do not seek the same goals, will not use the same control systems, and will use radically different organizational procedures and systems to deliver on their threats compared with nuclear armed states. If used tactically for immediate terrorist effect, a non-state nuclear terrorist could violently attack nuclear facilities, exploiting any number of vulnerabilities in fuel cycle facility security, or use actual nuclear materials and even warheads against military or civilian targets. If a persistent, strategically oriented nuclear terrorist succeed in gaining credible nuclear threat capacities, it might take hostage one or more states or cities.

If such an event coincides with already high levels of tension and even military collisions between the non-nuclear forces of nuclear armed states, then a non-state nuclear terrorist attack could impel a nuclear armed state to escalate its threat or even military actions against other states, in the belief that this targeted state may have sponsored the non-state attack, or was simply the source of the attack, whatever the declared identity of the attacking non-state entity. This outcome could trigger these states to go onto one or more of the pathways to inadvertent nuclear war, especially if the terrorist attack was on a high value and high risk nuclear facility or involved the seizure and/or use of fissile material.

Some experts dismiss this possibility as so remote as to be not worth worrying about. Yet the history of nuclear terrorism globally and in the Northeast Asian region suggests otherwise. Using the sand castle metaphor, once built on the high tide line, sand castles may withstand the wind but eventually succumb to the tide once it reaches the castle—at least once, usually twice a day. Also, theories of organizational and technological failure point to the coincidence of multiple, relatively insignificant driving events that interact or accumulate in ways that lead the “metasystem” to fail, even if each individual component of a system works perfectly. Thus, the potential catalytic effect of a nuclear terrorist incident is not that it would of itself lead to a sudden inter-state nuclear war; but that at a time of crisis when alert levels are already high, when control systems on nuclear forces have already shifted from primary emphasis on negative to positive control, when decision making is already stressed, when the potential for miscalculation is already high due to shows of force indicating that first-use is nigh, when rhetorical threats promising annihilation on the one hand, or collapse of morale and weakness on the other invite counter-vailing threats by nuclear adversaries or their allies to gain the upper hand in the “contest of resolve,” and when organizational cybernetics may be in play such that purposeful actions are implemented differently than intended, then a terrorist nuclear attack may shift a coincident combination of some or all of these factors to a threshold level where they collectively lead to a first-use decision by one or more nuclear-armed states. If the terrorist attack is timed or happens to coincide with high levels of inter-state tension involving nuclear-armed states, then some or all of these tendencies will likely be in play anyway—precisely the concern of those who posit pathways to inadvertent nuclear war as outlined in section 2 above.

The critical question is, just as a catalyst breaks some bonds and lets other bonds form, reducing the energy cost and time taken to achieve a chemical reaction, how would a nuclear terrorist attack at time of nuclear charged inter-state tension potentially shift the way that nuclear threat is projected and perceived in a four or five-way nuclear-prone conflict, and how might it affect the potential pathways to inadvertent nuclear war in such a system?

Such a pervasive incremental effect is shown in Figure 6 below.

Figure 6: Impact of a Terrorist Nuclear Threat or Attack on Interstate Nuclear Use Control

A diagram of a diagram

AI-generated content may be incorrect.

Any one or indeed all of these starting nuclear control profiles may be disputed, as might the control profile at the end of the response arrow. (In Figure 6, each nuclear state responds to a terrorist nuclear attack by loosening or abandoning negative controls against unauthorized use, and shifts towards reliance mostly on positive procedural controls biased towards use). But each nuclear armed state will make its moves in response to the posited terrorist nuclear attack partly in response to its expectations as to how other nuclear armed states will perceive and respond to these moves, as well as their perception that an enemy state may have sponsored a terrorist nuclear attack—and considered together, it is obvious that they may not share a common image of the other states’ motivations and actions in this response, leading to cumulative potential for misinterpretation and rapid subsequent action, reaction, and escalation.

It is also conceivable—although intuitively it would seem far less likely–that a terrorist nuclear attack at such a conjuncture of partly or fully mobilized nuclear armed states might induce one or more of them to stand down, slow down its decision making or deployments, establish new communication channels with potential nuclear enemy states, and even make common cause to hunt down and eliminate the non-state nuclear terrorist entity, or coordinate operations to respond to the threat of a second terrorist nuclear attack—the credibility of which would be high in the aftermath of a successful initial non-state nuclear attack.

As Robert Ayson concluded:

In considering the ways in which a terrorist nuclear attack could (wittingly or unwittingly) spark off a wider nuclear exchange government leaders are entitled to be just as worried about their own actions—how they would respond to a terrorist nuclear attack and how that response might get very catastrophically out of control—as about the terrorist act per se. If so, states need to do more than consider the best ways to prevent terrorists from acquiring, deploying and then detonating a nuclear weapon. They also need to think about how they can control themselves in the event of a nuclear terrorist attack (even if some might suggest this risks handing the terrorist a premature and unnecessary victory by giving them indirect influence over the choices states make).[20]

#### Nuclear leadership prevents illicit marketplaces which guarantees great power war while allowing the US to effectively leverage its diplomacy

Miller & Volpe 22 [Nicholas L. Miller; Associate Professor of Government at Dartmouth Ph.D. Massachusetts Institute of Technology, B.A. Wesleyan University. Tristan A. Volpe; associate professor in the Defense Analysis Department at the Naval Postgraduate School and a nonresident fellow in the Nuclear Policy Program at the Carnegie Endowment for International Peace. 4-3-2022, "The rise of the autocratic nuclear marketplace", Taylor & Francis, https://www.tandfonline.com/doi/full/10.1080/01402390.2022.2052725]

What are the foreign policy benefits of civil nuclear exports? Expensive nuclear projects can be attractive sources of commercial revenue. But states also supply civil nuclear technology to reap geopolitical rewards. According to Matthew Fuhrmann, ‘suppliers use this type of foreign aid as a tool of economic statecraft to influence the behavior of their friends and adversaries.’Footnote18 We focus on powerful suppliers – specifically great powers and their major power rivals – because these nations stand to gain greater strategic benefits from civil nuclear exports. Smaller nations tend to focus on reaping economic rewards.Footnote19 Recent research finds that atomic assistance is especially helpful when it comes to solidifying alliance coalitions, projecting influence, and managing ally proliferation. We draw on this scholarship to specify three international incentives for great powers – and rival major powers – to pursue nuclear exports.

First, civil nuclear exports enable powerful states to bolster alliance ties and attract new partners. The high value and relative scarcity of nuclear energy technology makes it an effective means of foreign assistance. As Fuhrmann argues, peaceful atomic assistance ‘allows a supplier state to develop a closer relationship with the importing state.’Footnote20 Nuclear power plants are valuable assets for nations to acquire, both for economic and prestige reasons. Foreign technology transfers often subsidize or at least offset some of the investment costs associated with developing nuclear enterprises from scratch. Fuhrmann demonstrates that by limiting nuclear cooperation to allies and select partners, great powers send atomic aid recipients ‘a credible signal of intent to forge a strategic partnership.’Footnote21 Other scholars find civil nuclear exports are intended to improve the international reputations of great powers, who outbid each other to solidify alliances and court the allegiance of nonaligned countries.Footnote22

Second, great powers can use civil nuclear exports to collect intelligence and exert leverage. The process of building nuclear power plants opens channels to elite decision makers in the recipient nation. Before any construction begins, the supplier meets with top government officials from the recipient country to negotiate the terms – what is often referred to as a nuclear cooperation agreement. Mark Hibbs finds that these agreements grant suppliers ‘access to strategic decisionmaking in [recipient] countries concerning technology, energy, and foreign policy for decades to come.’Footnote23 Once reactors come online, suppliers remain deeply embedded in the recipient’s nuclear program and broader energy production infrastructure.

Great powers also gain influence over nations who import nuclear technology. Nuclear power plants require significant resources to get off the ground. Suppliers can offer generous financing packages to build reactors without much capital investment from the recipient. But this debt generates political leverage for the supplier.Footnote24 In exchange, recipients may be asked to offer up something else beyond the four corners of the nuclear deal – such as favourable trade deals or preferential access to transshipment points. Or the supplier can cash in this chit for a favour down the road, when it needs the recipient to undertake specific actions. The upfront investment costs of large nuclear projects make them ideally suited for this type of transactional diplomacy.

After construction, nuclear power plants require special skills and materials to operate over long time periods. The average life cycle of nuclear power plants is around forty or fifty years. During this time, reactors need fuel, continuous maintenance, and spent fuel disposal. Many countries lack the resources and expertise to manage basic atomic energy operations, let alone supply themselves with the low enriched fuel that powers most of the power reactors in service today. Regardless of whether the supplier helped finance the construction of the reactor, this often makes recipients dependent on their patron, leaving them vulnerable to coercive diplomacy.Footnote25 Suppliers can threaten to hold back critical materials or services unless the recipient complies with their demands.Footnote26 Even if coercion is not explicitly used, generous nuclear support can predispose a recipient to accommodate a supplier’s foreign policy interests.

Third, civil nuclear exports help great powers to manage proliferation and dampen potential blowback from great power adversaries. One challenge with exporting nuclear power plants is that this technology can help recipients pursue weapons ambitions. But many of the same attributes that make civil nuclear exports effective for exercising leverage also enable great powers to reap nonproliferation benefits. Scholars show that great powers use nuclear trade to gain greater insight and influence over the trajectory of nuclear energy programs, often by conditioning exports on recipient countries joining the nonproliferation regime and opening themselves up to international inspection.Footnote27

The above-board nature of civil nuclear exports also lowers the risk of direct confrontation with another great power. Some states supply sensitive nuclear technology to help the enemy of another rival acquire nuclear weapons.Footnote28 But the problem with military atomic assistance is that it is likely to draw the wrath of another great power rival. Great power suppliers can protect themselves from this blowback by using the above-board marketplace to sell nuclear plants in full compliance with international safeguards and by refraining from transferring sensitive fuel cycle facilities. The need to protect nuclear facilities from attack also creates an avenue for more direct military cooperation. Recipients may request additional force training and military hardware to defend nuclear infrastructure. This creates an opportunity for great powers to improve military cooperation with key recipients without directly targeting another rival.

In sum, civil nuclear exports help powerful nations to (1) shore up political relations with close allies and court nonaligned partners; (2) establish beachheads for projecting influence and insight abroad; and (3) lower the risks of potential blowback. Yet these alluring attributes raise the question of why some nations seem to abandon civil nuclear exports over time.

#### US diplomacy averts great power war---it’s goldilocks---otherwise cling or regional rise guarantee extinction

Ashford 25 [Emma Ashford; PhD in Political Science from the University of Virginia, MA in IR from American, BA in Politics from the University of Virginia, senior fellow at the Stimson Center, adjunct assistant professor in the Security Studies Program at Georgetown University. 26 Aug 2025. “First Among Equals: U.S. Foreign Policy in a Multipolar World,” https://yalebooks.yale.edu/book/9780300279542/first-among-equals/]

President Xi has expressed this sentiment before. The idea that China is emerging from a historic century of weakness and that the world is changing characterizes many of his speeches, as does the idea that this century will be China’s to shape. Like many leaders of countries not entirely satisfied with U.S. hegemony, he looks to a multipolar world as a harbinger of American decline. Putin’s infamous speech at the Munich Security Conference in 2007 likewise contrasted multipolarity with the perceived evils of U.S. unipolarity.2 But although Xi or Putin may be correct on the diagnosis—the world is indeed undergoing significant structural changes—it is far from clear that the transition to a multipolar world necessitates U.S. decline or failure. There are certainly scenarios for the next few decades in which the United States overextends itself and is forced to retrench abruptly in response to crisis. But there are others in which the country wisely manages the transition into multipolarity and becomes a respected leader in a more diverse international system. Indeed, as I have argued in this book, embracing multipolarity is a winning strategy for the United States, one that allows it to nurture the rise of other capable actors in Europe and Asia, create a backstop for U.S. power, and hedge against China, Russia, and other less friendly states. The world—as Xi Jinping put it—is changing; the United States can shepherd that change in a more productive direction.

Doing so will require policymakers in Washington to embrace a more realist and prudent approach to the world. Prudence does not necessarily mean accepting the status quo; big changes in the international order—today as in past decades—will require difficult choices and shifts in U.S. strategy if the United States is to adapt effectively. But it will require policymakers to shed their unipolar mindset. America remains unique and unparalleled in many ways, but it is no longer the only power capable of shaping the international system. Policymakers must learn to engage with the emerging world on its own terms, focusing more on concrete American interests than on grand global crusades.

Realist Internationalism in Brief

They say that novelty has a quality all its own. Indeed, psychologists have found that new and exciting experiences create dopamine in the brain. Human beings are hardwired to seek novelty. Perhaps this is one reason Washington has been inundated in recent years with innovative grand strategies, such as networked strategies of “open order building,” strategies of “responsible competition,” and attempts to build “integrated deterrence.” It is ironic that one of the few strategy documents that draws on a more classic understanding of international relations—the Trump administration’s 2017 national security strategy—does not in fact define a strategy and relies instead on the more descriptive term “great power competition.”3

Yet sometimes, old ideas persist for a reason. Realism as a formal theory may only be a century or so old, but its philosophical roots—which emphasize the importance of state sovereignty, the frailty of human nature, and the inherently tragic nature of the international system—go back millennia.4 Throughout U.S. history, policymakers have tried to blend liberal idealism and realist prudence into strategy, but that balance has become lopsided in recent years, as policymakers took the opportunities afforded by the unipolar moment to pursue grand liberal crusades. This book argues that it is time to right the balance between liberalism and realism in U.S. foreign policy. Policymakers should not abandon their liberal ideals at home but should re-embrace core realist principles in foreign policy: focusing on interests over values, keeping threats in perspective, and seeking to manage the world rather than transform it. In doing so, they can better prepare America to flourish in an increasingly multipolar world.

At its core, this book argues that the United States must fundamentally reconceptualize its role in the world, from global hegemon to shared leadership. American strategy of the unipolar moment was one of universalism: offering security guarantees to almost any state that asked. Today, that universalism is a recipe for deterrence failure and overreach. Policymakers must learn to prioritize again and focus on commitments that are most important to core U.S. interests: protecting the U.S. homeland and the security and prosperity of Americans, as well as maintaining an acceptable global balance of power by preventing the rise of other regional hegemons. They must balance these interests against the potential for catastrophic great power war in the nuclear era. This will require changes in the mindset policymakers bring to bear on foreign policy; most importantly, they will need to define American interests significantly more narrowly in coming decades. And they will need to learn to accept that there are places, particularly in areas closest to other major competitors, where American interests are marginal and U.S. power is insufficient to compel other states to comply with our preferences. The nuclear question is particularly salient. As Robert Jervis puts it, in the nuclear era, “the pursuit of primacy” is no longer “worth the candle.”5 We have not seen a multipolar nuclear era before, but the experience of the Cold War tells us that there will be some places where U.S. interests will warrant the risk of nuclear escalation and other places where these interests are not sufficient to take such a monumental risk. Since 1991, policymakers have rarely had to draw this critical distinction in their own thinking; it is essential that they begin to do so again.

#### Diplomacy itself is key---dissuades aggression and promotes outreach

Beckley 25 [Michael Beckley, Professor of Political Science at Tufts University, Nonresident Senior Fellow at the American Enterprise Institute, “The Strange Triumph of a Broken America,” Foreign Affairs, 1-7-2025, https://www.foreignaffairs.com/united-states/strange-triumph-broken-america-michael-beckley/]

The structure of American power thus creates competing pressures for detachment and engagement. The result is a hollow form of internationalism that has sometimes resulted in disastrous failures of deterrence. In the 1920s, for instance, the United States opposed German and Japanese expansion but outsourced enforcement to treaties such as the Kellogg-Briand Pact, which outlawed war, and the League of Nations, which Washington then refused to join. The United States withdrew its forces from Europe while demanding debt payments from allies, who passed the costs on to Germany, worsening its financial turmoil and hastening its slide into Nazism. At the same time, in Asia, the United States abandoned plans for naval modernization and regional fortification but imposed increasingly severe sanctions on Japan, intensifying Tokyo’s perception of Washington as both hostile and vulnerable—thereby paving the road to the attack on Pearl Harbor. A similar pattern played out in the 1990s and the early years of this century. While nearly doubling NATO’s membership to include 12 new countries, the United States halved its troop presence in Europe and shifted NATO’s focus to counterterrorism operations in the Middle East. In 2008, the United States suggested that Georgia and Ukraine might eventually join the alliance but offered no concrete path to membership, thus provoking Russia without effectively deterring it. In other cases, hollow internationalism led the United States to neglect deterrence entirely. On several occasions, it convinced itself and its adversaries that it had little interest in a region, only to respond massively to aggression there, with catastrophic consequences. In 1949, for instance, the United States excluded the Korean Peninsula from its defense perimeter and withdrew its troops. Yet when North Korea invaded South Korea, the United States intervened forcefully, pushing up to the Chinese border and provoking a ferocious Chinese counterattack. This shock heightened Cold War fears of communist expansion and solidified the domino theory: the idea that if one state falls to communism, its neighbors will, too. This notion in turn propelled Washington’s disastrous involvement in Vietnam. Similarly, in 1990, the United States made no serious effort to deter Iraq’s invasion of Kuwait but then took up arms to repel the attack after the fact. The result was the Gulf War and a prolonged U.S. military presence in the Middle East, which in turn mobilized jihadi groups such as al Qaeda—an outcome that culminated in the 9/11 attacks and the U.S. invasions of Afghanistan and Iraq. The world now faces converging threats: China is carrying out the largest peacetime military buildup since Nazi Germany’s, producing warships, combat aircraft, and missiles five to six times as fast as the United States can. Russia is waging Europe’s biggest war since World War II. Iran is trading blows with Israel, and North Korea is sending thousands of troops to fight for Russia in Ukraine while preparing for war with South Korea and developing nuclear missiles that can reach the U.S. mainland. Despite treating these regimes as enemies, the United States spends only 2.7 percent of GDP on defense, a level comparable to that of the post–Cold War 1990s and the isolationist 1930s and well below the Cold War range of six to ten percent. A military recruitment crisis compounds the shortfall, with 77 percent of young Americans ineligible for service because of obesity, drug use, or health issues and just nine percent expressing an interest in enlisting. In a potential conflict with China, U.S. forces would blow through their munitions inventory in a matter of weeks, and it would take years for the U.S. defense industrial base to produce replacements. Rising personnel costs, along with an endless array of peacetime missions, are stretching U.S. forces thin. By pairing diplomatic hostility with military unreadiness, the United States is once again sending the world a mixed signal, a yellow traffic light. Yellow lights, of course, often prompt aggressive drivers to speed up. American ambiguity won’t matter—until it does, when China, Iran, North Korea, or Russia decides it’s time to take what it has long claimed by force.https://www.foreignaffairs.com/united-states/strange-triumph-broken-america-michael-beckley] THE DANGERS OF DECLINISM Since the Soviet Union’s collapse, experts have urged policymakers to prepare for multipolarity, expecting the United States to be challenged or overtaken by rising powers. But reality has taken a different course. The United States remains economically dominant while other contenders—both adversaries and allies—are slipping into long-term decline. Shrinking populations and stagnant productivity are eroding the strength of once dominant Eurasian powers. Meanwhile, populous countries such as India and Nigeria struggle to ascend global value chains because of poor infrastructure, corruption, and weak education systems. Automation and the commodification of manufacturing are shutting off traditional growth paths, leaving many developing countries mired in debt, youth unemployment, and political instability. Rather than triggering a rise of the rest, current trends are solidifying a unipolar world with the United States as the sole superpower, surrounded by declining great powers and a periphery of middle powers, developing countries, and failing states. In the long run, a world without rising powers could foster stability by reducing the risk of hegemonic wars. Over the past 250 years, the Industrial Revolution caused economies, populations, and militaries to double or more in size within a generation, sparking intense competition for resources and territory. But that era is winding down. Shrinking populations, stagnant economies, and the concentration of wealth in the United States make the rise of new great powers unlikely. Some analysts characterize China, Iran, North Korea, and Russia as an “axis,” but the world is unlikely to see a repeat of 1942, when Germany, Japan, and Italy seized half of the world’s productive capacity. Today’s fading challengers lack the strength to overrun Eurasia quickly, and once a great power falters, it no longer has the population growth to rebound, as Germany did between the world wars and the Soviet Union did after World War II. It’s hard to imagine Russia, for example, rising from the ashes of Ukraine to conquer large swaths of Europe. As rising powers fade, the world may become more stable. But right now, several threats loom. Declining powers may resort to desperate wars of irredentism to reclaim what they believe are “lost” territories and avoid slipping permanently into second-tier status. Russia has already done this in Ukraine, and China might take similar actions in Taiwan or against the Philippines in the South China Sea. Although these conflicts may not match World War II’s scale, they could still be ghastly, involving nuclear threats and attacks on critical infrastructure. China, North Korea, and Russia face economic and demographic decline, but so do their most likely targets—South Korea, Taiwan, and the Baltic states—ensuring that Eurasia’s military balances will remain hotly contested. Even without sparking massive wars, China and Russia could gradually transform into gigantic North Koreas, relying increasingly on totalitarianism and military extortion to undermine an international order they can no longer hope to dominate. Another threat is rampant state failure, particularly in debt-ridden countries with rapidly growing populations. Sub-Saharan Africa, for example, is expected to add one billion people by 2050, yet most of its economies are already in fiscal crisis. Manufacturing no longer provides mass employment, and governments are slashing social spending to pay foreign loan interest. According to the United Nations, an estimated 3.3 billion people live in countries where interest payments exceed investments in either education or health care. The stagnation of major economies is worsening the situation. A slowing China, for instance, has halted most of its foreign lending while reducing its imports from poor countries and flooding their markets with subsidized exports, delivering a triple blow to their economies. A spiral of state failure could magnify a third threat: the continued rise of anti-liberalism in democratic countries. Many democracies are already struggling with demographic decline, sluggish economic growth, soaring debt, and ascendant extremist parties. A surge of refugees from failing states could further strengthen these antidemocratic movements. After the Syrian civil war sent more than a million refugees to Europe, for example, authoritarian parties made substantial gains across the continent. Liberal democracy has flourished in times of economic expansion, population growth, and social cohesion, but it’s uncertain whether it can survive an era of stagnation and mass migration. The United States must contain these threats while continuing to harness its geographic, demographic, and institutional advantages. A crucial first step is rejecting the misperception that the country is doomed to decline. Nearly four decades ago, the political scientist Samuel Huntington argued in these pages that Americans must fear decline to avoid it. But fear risks becoming a self-fulfilling prophecy. An exaggerated sense of decay is already starting to destabilize democracy, as some Americans lose faith in the system and turn to antiliberal solutions. Some are rallying behind white nationalism, propelled by fears of demographic shifts and “great replacement” conspiracy theories, which falsely claim that political elites encourage mass immigration to replace white Americans with minorities. Others are stoking minority grievances to mobilize voters along ethnic lines. Such cynical strategies have fostered harmful policies, such as defunding the police or mass deportations, eroding trust in democracy and potentially enabling demagogues to dismantle the republic’s checks and balances. Fearing decline, the United States might lean toward protectionism and xenophobia, walling itself off rather than competing internationally, which would undermine its core strengths. The country has thrived on the free flow of goods, people, and ideas, soaking up foreign talent and capital like a sponge and building a global commercial order that attracts allies. But if the United States embraces a false narrative of decline, it risks becoming a rogue superpower, a mercantilist behemoth determined to squeeze every ounce of wealth and power from the rest of the world. Tariffs, sanctions, and military threats could replace diplomacy and trade, alliances might become protection rackets, and immigration could be sharply restricted. This nativist turn might yield short-term gains for Americans, but it would ultimately hurt them by making the world they inhabit poorer and less secure. Trade and security networks could collapse, sparking resource-driven conflicts and killing off any possibility for cooperation on nuclear nonproliferation, climate change, pandemics, and other global challenges—accelerating a descent into anarchy. The most immediate danger is that the United States will convince itself—and its adversaries—that it lacks the will or the capacity to counter large-scale aggression. To avoid asserting its interests without backing them up (thereby provoking aggressors without deterring them) or prematurely withdrawing from regions (forcing a rushed and costly reentry), the United States must rigorously reassess its core interests and determine where containing aggression is essential. The U.S. national security establishment believes this means preventing China, Iran, North Korea, and Russia from destroying their neighbors. This conviction—that powerful revisionist tyrannies should be contained—is as straightforward as it is hard learned. After World War I, the United States withdrew from Eurasia, a decision that contributed to the outbreak of World War II. In contrast, after World War II, the United States maintained peacetime alliances in Eurasia, ultimately defeating Soviet communism without triggering World War III, and providing the security foundation for an unprecedented surge in global prosperity and democracy. The key to success, then as now, is blending strength with diplomacy: building a credible military presence to deter aggression while offering revisionist powers a path to reintegration with the West if they renounce military conquest. During the Cold War, the United States contained the Soviet Union until internal weaknesses forced Moscow to retreat. A similar strategy could work today. China’s economy is stagnating, and its population is shrinking. Russia is bogged down in Ukraine, and Iran has been battered by Israel. Chinese President Xi Jinping, Russian President Vladimir Putin, and Iranian Supreme Leader Ali Khamenei are aging heads of state whose reigns will likely end within the next decade or two. The United States doesn’t need to contain their regimes indefinitely—perhaps just long enough for current trends to play out. As their power declines, their imperial dreams may seem increasingly unattainable, potentially prompting successors to chart a new course. In the meantime, Washington should sap their strength by welcoming their brightest people to the United States through immigration and by strengthening connections with their societies through student visas, diplomatic exchanges, and nonstrategic trade. China, Iran, North Korea, and Russia, however, are unlikely to mellow overnight. The United States’ struggle against these countries may not last forever, but Washington must prepare for a contest that could last years. In this competition, domestic unity will be essential. Investing in jobs, infrastructure, housing, and education in neglected areas—and rekindling a spirit of civic duty—will be crucial not only to mend national fissures but also to fortify the United States against foreign threats. Calling on Americans to stand up to autocratic aggression doesn’t mean rushing into war; it means creating a future in which peace is secured through sustained investments in military strength and diplomatic outreach. It means rallying a nation to recognize its immense power and accept the responsibility to wield it, not in frenzied reaction but before the storm—with purpose and prudence.

#### Independently, Russia and China’s build-own-operate FNPPs (floating nuclear power plants) cause extinction---only disincentivizing their exports solve

Sullivan 24 [Thomas Sullivan; JD Law Student 2024, Schulich School of Law Halifax, Nova Scotia Canada, 6-18-2024, "Murky Waters: Controlling the Ocean Transit of Floating Nuclear Power Plants", Brill, https://brill.com/view/journals/ocyo/38/1/article-p253\_10.xml]

In focusing on the risks that Build Own Operate FNPP s present to transit States, it must first be recognized that the plants are carrying ultrahazardous cargo. As described by Professor Jon M. Van Dyke, an expert in the shipment of ultrahazardous radioactive materials, waste from an FNPP is a highly radioactive and radiotoxic substance replete with beta-gamma activity. Fuel used to power FNPP s, such as mixed oxide (MOX) fuel, can be converted to create nuclear weapons. A marine environment exposed to FNPP fuel or waste would experience widespread, long-lasting radioactive contamination.47 In a 2007 Master’s thesis, Lisa Welming highlighted the catastrophic threats of nuclear accidents at sea, describing the natural flow of the ocean and the ability for nuclear accidents to spread quickly without practical containment options as combining to pose global risks.48 Such an accident could severely jeopardize the health of the terrestrial, aquatic, and airborne species that interact with the exposed marine environment. An FNPP accident sufficiently close to a transit State could have extensive coastal impacts, affecting the land-based environment and population.49 Further, marine-affiliated economic activities, including tourism and fishing, would likely be devastated.50 Considering all of this, the cargo that FNPP s transport exceeds the status of mere “dangerous goods.” FNPP s carry “ultrahazardous” material and must be dealt with accordingly.51

Due to the mobile, ocean-bound nature of FNPP s, they are unique among international nuclear dangers in that they pose hazards associated with both radioactive waste shipments and traditional nuclear installations. Some risks, such as ocean collisions, are shared by other radioactive cargo shipments through marine environments.52 Other risks, such as tsunamis, are also experienced by land-based nuclear facilities.53 However, FNPP s potentially combine the most salient dangers faced by both marine shipments and terrestrial installations. First, an FNPP on a refueling voyage to the supplier State would be carrying up to 12 years’ worth of radioactive waste; perhaps more as fuel and hull storage capacities increase. This fact makes FNPP s comparable to the radioactive waste shipments protested internationally throughout the 1990s and early 2000s.54 Second, because of the presence of a functional nuclear reactor—perhaps operating to propel future models—FNPP s face the nuclear meltdown risks of land-based facilities. Despite the lower accident risks and smaller sizes of SMR s as compared to conventional nuclear reactors, a radioactive exposure even a fraction the size of those incurred at Chernobyl and Fukushima would carry environmental, health, safety, and economic consequences and require the establishment of a large containment zone.55 As Build Own Operate FNPP s are novel entities, some of the following risk analysis will be extrapolated from the established literature on dangers faced by both marine radioactive waste shipments and land-based nuclear reactors.

Saltwater corrosion, tsunamis, extreme weather, and collisions all threaten to expose marine environments to the ultrahazardous cargo aboard FNPP s.56 For tsunamis, travel in deeper waters would minimize the risk faced by an FNPP.57 However, it might not be practical for FNPP s in transit to always travel in sufficiently deep waters to avoid tsunamis, as international shipping routes can bottleneck, pushing vessels closer to coastal areas. When entering busy shipping lanes such as those in Southeast Asia, FNPP s would face increased danger from possible collisions.58 The swaying and heaving of in-transit FNPP s might also affect the health of flora, fauna, and ecosystems.59 An FNPP travelling through several climate zones, like on a voyage from the Russian Arctic to a Pacific Island nation, would be exposed to added stresses from extreme temperature transitions.60 In cold climates, the heat generated by functioning FNPP s could lead to localized water temperature increases that might fatally damage the surrounding marine environment.61 Cold climates further present collision risks with icebergs. Additionally, all FNPP voyages will face the possibility of collisions occurring with other vessels, in rocky coastal waters, and with atolls and islands when visibility is poor.

In the event of a catastrophic incident, like a core meltdown, exposure of the overheated core to seawater could create large amounts of radioactive steam. This would transform the incident into an airborne event, having the potential to affect a vast area of populated and unpopulated environments.62 Similarly, the release of radioactivity into the hydrosphere could see an FNPP accident disperse globally.63 Because Build Own Operate programs are designed to target nations in remote areas that lack robust infrastructure, delayed responsiveness to isolated marine locations would likely occur in the event of an emergency.64 Without a strong contingency plan and clear assignment of responsibility, confusion between supplier States, transit States, and host nations could exacerbate delays. Finally, much is unknown about impacts on the marine biosphere from even low-level radionuclide exposures.65 As such, the events of a marine nuclear accident could turn out to be more environmentally deleterious than current analysis suggests.

Security risks are also a significant concern for FNPP s, which face challenges distinct from fixed-land facilities.66 Given the weapons-grade nature of radioactive waste and fuel,67 FNPP s could be expected to be attractive targets for pirates and terrorists.68 In the case of nuclear cargo shipments, environmental activists have staged demonstrations in which they gain access to a ship carrying radioactive waste. The intention is to illustrate the ease with which nefarious actors might board such a vessel.69 Considering that FNPP s are equipped with one or more nuclear reactors, they could be expected to be armed with more security than regular nuclear waste shipments. However, the potential use of deadly force by Russian guards in another nation’s waters, for example, raises complex legal and geopolitical issues.70

For some scholars, the fact that FNPP s can observe sightlines extending to the horizon (around 12 nautical miles) makes intruders less likely to approach undetected when compared to land-based nuclear facilities. A slower rate of approach for attackers is also argued to exist in water versus on land.71 However, the potential for internal or external FNPP hijacking and the decreased emergency response capabilities that accompany offshore locations are two issues that afflict marine nuclear installations in unique ways.72 Further, an FNPP would have access to a limited security apparatus when compared to land-based installations. Land-based nuclear facilities are often protected by a series of fences and concrete barriers, roving security forces, and access to local military or police services. Further, their environments are fixed and unchanging, thus allowing more predictive security planning. These security features would either be difficult or impossible to replicate for in-transit FNPP s. Notably, Russia desires to supply FNPP s to nations in Southeast Asia, an area with heightened piracy and terrorism risks.73 Given the infancy of Build Own Operate FNPP s, security gaps might be exploited before best practices for defense are established. Two immediate security goals should be learning to establish a secure perimeter around a transiting FNPP and determining the best way to protect against underwater attacks.74

Given the potential slow-moving nature of FNPP s, they could be easy targets for attacks if not guarded by military convoys. The IAEA has listed a variety of security concerns for FNPP s in transit, including theft, hijacking, attacks on the reactor or fuel, and malevolent collisions. The IAEA recognizes that transit between a supplier State and a host State might see an FNPP cross into a transit State’s waters. Regarding the security of FNPP s in this situation, the IAEA maintains that responsibilities should be clearly assigned and coordinated, but that security should never be outside the responsibility of any involved State.75 For reasons to be discussed in the fourth part of this article, “The Rights of Transit States,” while transit States should not be burdened with guaranteeing the safety and security of foreign FNPP s travelling through their waters, they should be involved in dictating routes to be taken and precautionary measures to be followed.

Likely the greatest environmental threat posed by FNPP s will come in the refueling journey. Every refueling journey, the FNPP will be 12 or more years older and carrying a full hull of radioactive waste, potentially over thousands of kilometers. Aging facilities that have been weathering ocean storms and saltwater corrosion will be tasked with making trips through multiple climate zones.76 On the initial journey from a supplier State to a host nation, FNPP s will carry fuel and any irradiated substances contained within the reactor’s core. However, on the refueling journey in the opposite direction, they will carry a full hull of radioactive waste, any irradiated substances contained within the core, and the amount of fuel necessary to complete the voyage. Wang et al. note that if the ocean tilts an FNPP beyond a certain point, its safety mechanisms may malfunction.77 For vessels self-propelled by their own nuclear power, the risk of a catastrophic nuclear incident will substantially increase. As FNPP s are complex, novel pieces of marine nuclear technology, heightened potential for human-error-induced accidents should be expected, absent only through the most diligent training.78 Further, a storm, tsunami, or collision might create an onboard fire or damage the reactor cooling systems of the FNPP. Any of the above scenarios could create conditions leading to the core overheating, in turn causing a meltdown.79

### 1AC---Plan

#### Plan:

#### The United States Federal Government should restore collective bargaining for Nuclear Regulatory Commission workers in the United States.

### 1AC---Solvency

#### Contention 4 is Solvency:

#### Trump’s deregulatory agenda is catastrophic for nuclear, whose existence requires expertise and institutional stability

**Nordhaus 25** [Ted Nordhaus; leading global thinker on energy, environment, climate, human development, and politics. He is the founder and executive director of the Breakthrough Institute, 6-26-2025, "State Power Without State Capacity", Breakthrough Institute, https://thebreakthrough.org/issues/energy/state-power-without-state-capacity]

For both defenders of technocratic competence and capacity and skeptics, the coming years will be a test of whether an administration hell bent on radically reducing the regulatory and bureaucratic obstacles to deploying energy technology and infrastructure can deliver the goods. Can it produce rules and procedures that are simple and navigable, in a timely fashion, and in a way that will withstand judicial scrutiny? Can the resulting regulatory and governance framework deliver results with vastly less manpower? Will the combination of fewer rules, fewer regulations, and less enforcement unleash a future of cheap, abundant, and, perhaps, clean energy or will it have catastrophic results for public health and the environment?

If there has been a metaphor for the break things approach that the Trump Administration is taking to the federal administrative state, it was Elon Musk’s reboot of Twitter, now X. Musk promised big improvements and laid off 80% of the staff in a matter of months. But most people hardly noticed. While the enshittification of the platform continued apace, and arguably accelerated, the dramatic reductions didn’t appreciably diminish the basic functionality of the platform.

Musk’s short tenure at DOGE is now over. Yet the idea lives on. A radical downsizing of the federal regulatory bureaucracy is well underway. But the things that could go wrong are far more consequential than they are on a social media platform. Planes crashing and X crashing are not the same thing. Advocates of radical deregulation and downsizing should not be cavalier about these risks. I have long argued that worst case nuclear accidents, for instance, are far less catastrophic than both conventional wisdom and America’s nuclear regulator have long assumed. But even if one sees meltdowns and other serious nuclear accidents as garden variety industrial accidents, and not existential events, a rash of meltdowns and other releases of radioactive material would deeply challenge the nuclear regulatory reform project. The same is true across many other technologies and sectors.

Less dramatically, many technocratic minded reformers warn of the unintended consequences of slash and burn reform, that taking a chainsaw to long established regulatory frameworks, administrative processes, and technocratic capacity may end up creating more regulatory uncertainty than it resolves. It is hard to parse to what degree these concerns, often coming from those who have worked inside the bureaucratic beast, reflect underlying assumptions about the scope of reform and what the federal judiciary and the broader political climate will allow. The guardrails or deep state, depending on one’s perspective, limited the scope of reform, norm busting, and application of executive power during the first Trump administration. It is less clear that this will be the case in the second.

In all likelihood, the result of all this breaking of things will be more muddle than either triumph or catastrophe. Significant chunks of the federal bureaucracy may disappear without being much missed. Elsewhere, ill-conceived revisions, rescissions, and staffing reductions may have significant impacts on the ability of the federal government to deliver public goods that this Administration is deeply committed to.

Whatever happens, we are much closer to finding out than we were three or four months ago. The window for rapid fire, splashy executive orders is fast coming to a close. The next phase will prove far more consequential and determinative of the possibilities of deep reform to the federal administrative state. The arsonists are not only in the building but seated in the executive offices, at the Departments of Energy and Interior, at the EPA, and at the NRC and FERC. Breaking things is the easy part. But after that is done, the Trump administration and its allies will need to clear a path through all that rubble to deliver cheap nuclear energy, reliable electricity, and a well diversified energy economy. We’ll find out soon enough whether they are capable of doing so.

#### Trump has realized that and wants to expand the workforce

Patteson 25 [Callie Patteson; joint master’s in journalism from Aarhus University, Denmark, and the University of Amsterdam, Netherlands. She received her bachelor’s from The King’s College, New York. Energy and environment reporter for the Washington Examiner. Previously, Callie was a national politics reporter for the New York Post and also worked as an associate breaking news editor for the Washington Examiner, 11-11-2025, "Regulatory agency will expand, not shrink, for nuclear buildout, Trump official says", Washington Examiner, https://www.washingtonexaminer.com/policy/3883143/trump-nuclear-regulatory-commission-overhaul-expand-agency/]

Rapidly deploying more nuclear power will require the Nuclear Regulatory Commission to grow in size, not shrink, the Trump administration now says, even as outsiders worry the agency is on the chopping block.

For months, many have feared that President Donald Trump’s executive order on restructuring the regulatory agency would result in sweeping staffing cuts, making it more difficult to deliver on the administration’s goals of quadrupling domestic nuclear capacity and building 10 large new reactors.

Since the executive order was signed in May, the NRC has lost dozens of employees, including several members of the agency’s senior leadership team, as well as two commissioners.

The Trump administration does not appear concerned by these departures, however, and is instead confident that as more companies look to secure federal licenses to build new nuclear power plants and small reactors, the regulatory agency will also expand.

“Despite some of the language in the executive order, the NRC is almost certainly going to be growing in the coming years,” Seth Cohen, chief counsel for nuclear policy at the Department of Energy, said during the American Nuclear Society’s winter conference on Tuesday.

Cohen acknowledged that messaging regarding restructuring workforce understanding can be a cause of concern for any industry.

While the executive order is meant to reduce redundancy on internal teams and provide clearer operational capabilities, Cohen said, the administration’s goal is not to “make this the tiniest Nuclear Regulatory Commission it can be.”

“The president fully anticipates that the NRC will likely need to grow to accommodate an increase in applications that can support 300 additional gigawatts of nuclear power by 2050,” Cohen said.

Cohen has remained central to the administration’s implementation of Trump’s order to rehaul the NRC.

During a Senate hearing with NRC chairman David Wright in September, it was revealed that Cohen had applied pressure on NRC commissioners to “rubber-stamp” and expedite the president’s nuclear agenda during a meeting in May.

“I said, ‘We were just talking about the executive order for DOE, DOD,’ and that’s when the comment was made,” Wright testified. “[Cohen] said, ‘Oh well, y’all are basically going to put in a practice that’s going to sort of rubber-stamp what they do.’”

“We pushed back and said, ‘We don’t rubber-stamp anything at the NRC,’” Wright said.

The NRC has not had a fully seated commission board since the end of July, when commissioner Annie Caputo resigned. Her departure came one month after the unprecedented dismissal of Democratic commissioner Chris Hanson.

Trump has nominated two individuals to fill the empty seats, NRC alums Ho Nieh and Douglas Weaver, and the Senate is poised to vote on Nieh’s nomination in the coming days.

With two commission seats still open and dozens of staffers on the outs, some industry leaders and executives have been worried that the NRC will be unable to accelerate its approval process for new nuclear projects.

Doug Robinson, founder and CEO of advanced nuclear company Natura Resources, told the Washington Examiner on the sidelines of the ANS conference that he views the situation similar to that of the Railroad Commission of Texas, which regulates the oil and gas industry in the Lone Star State.

“The Railroad Commission was constantly losing people to the industry they were trying to regulate,” Robinson said. “So there was that constant push and pull back and forth of ‘we need the Railroad Commission to move faster’ [and] the Railroad Commission say, ‘Well, quit stealing our people.’”

He warned that the NRC could face that same pressure amid the sweeping staff cuts. He described the cuts as a “short- to long-term concern” for the industry as dozens of small modular reactor firms and other advanced nuclear companies look to obtain federal licenses to build.

“They could see dozens of applications coming in from all these different designs and groups, and at that point, I don’t know if they have the manpower to do that,” Robinson said.

As the administration has acknowledged these fears, NRC staff have also sought to assuage the concerns.

During the ANS conference on Tuesday, David Curtis, special assistant for the ADVANCE Act and Executive Orders at the NRC, said that the agency has been constantly hiring and will continue to do so.

#### BUT doesn’t understand the importance of collective bargaining rights for the NRC

Lyman 25 [Edwin Lyman; physicist and the Director of Nuclear Power Safety with the Union of Concerned Scientists. PhD and M.Sc. in Physics. May 19, 2025, "Trump's "wins" on nuclear power are losses for taxpayers and public safety", Bulletin of the Atomic Scientists, https://thebulletin.org/2025/05/trumps-wins-on-nuclear-power-are-losses-for-taxpayers-and-public-safety/]

Looking at the “nuclear loss” side of the ledger is the Trump administration’s assault on independent federal agencies, including the NRC. Only last year, there was bipartisan concern as to whether the NRC would have enough experienced personnel to efficiently handle a projected onslaught of new applications. Now, the succession of attacks on the NRC’s workforce—from DOGE’s fork-in-the-road e-mail offering voluntary departure to federal workers, to the end of remote work, to the termination of its collective bargaining agreement—will have predictably devastating effects on employee morale, retention, and recruitment. Moreover, Trump’s burdensome and confusing executive orders—including requirements that agency actions be reviewed in secret by White House political appointees, and all energy permitting regulations be periodically reissued or scrapped—are recipes for delays and chaos.

**It's something all negative studies underestimate**

**Gensler** & Menand **25** [Gary Gensler; Professor of the Practice of Global Economics and Management as well as of Finance at the MIT Sloan School of Management. Lev Menand; associate professor of law at Columbia Law School where he directs the Project on Public Economic Law. “Presidential Supremacy Over Administrative Agencies” 6-2025. https://scholarship.law.columbia.edu/faculty\_scholarship/4715/]

The new administration’s reduction in agency autonomy and change of civil service protections, in particular, may lead to an increase in policy and adjudicative errors. First, it interposes less expert White House and inter-agency staff into agency decision making. Second, centralising decision-making authority in the White House bureaucracy may lead to lower quality decisions as information is diffuse (Hayek 1945). In many cases, OIRA lacks the local knowledge of agency decision makers and also may lack the same degree of technical expertise (Bressman and Vandenbergh 2006). Third, it may reduce the quality of personnel at agencies, as top talent will be serving in positions with reduced authority (Richardson 2019). Fourth, it may increase turnover in agency leadership, since term tenures will no longer be binding on new presidents. Fifth, it may reduce the number of expert senior career executives, as more positions will be subject to political control rather than merit based. The loss of state capacity through the downsizing of many agencies is likely to add to the risk of errors and delays (see Chapter 4 by Josh Bivens).

Recent empirical work demonstrates that independent agencies that do not go through OIRA review have significantly greater policymaking capacity (measured in terms of expertise and experience) (Bednar 2024: 662). Of the ten federal agencies with the highest capacity, seven have been exempt from the OIRA process (SEC, FTC, Nuclear Regulatory Commission, Federal Communications Commission, NLRB, Consumer Financial Protection Bureau, and FDIC). (The other three are NASA, EPA, and DOE – which includes the National Labs) (Bednar 2025: 658). Based on surveys of federal employees in 2014, Devins and Lewis argue that independent agencies today “are no more expert than executive agencies” (2023: 1311). Their survey results, however, suggest that independent agencies with significant policy making authority are indeed considered more expert than similarly situated executive agencies.29

#### The deciding factor is non-centralized environments

**Lofthouse** & Schaefer **24** [Jordan K. Lofthouse; Senior Fellow with the FA Hayek Program for Advanced Study in Philosophy, Politics, and Economics at the Mercatus Center at George Mason University. Alexander **Schaefer**; Assistant professor of Philosophy at the University of Buffalo “Expert Knowledge and the Administrative State.” 10/17/24. Public Choice 202, 433-454.]

Defenders of the administrative state typically cite the importance of expert guidance for achieving good governance—the expertise claim. We have not argued that this claim is universally false. Instead, we have introduced an important qualification: expertise is reliable, and thus beneficial, only in certain institutional environments. The current system of public administration—characterized by high levels of centralized administrative power—provides an inadequate epistemic ecosystem, one that stifles contestation, competition, and diversity. A superior alternative, one which offers scope for dissent, experimentation, as well as perspectival and institutional diversity, is something that closely resembles the Ostromian idea of polycentric governance.

**Which the NRC is, but the agencies their ev is about are not**

**Gibson 22** [Nathan David Gibson; Assistant Professor of Political Science at Elizabethtown College. Ph.D. and M.A. in Politics from Princeton University as well as a B.A. in Public Policy Studies from Vanderbilt University. [NOTE: This was the PhD Dissertation] January 2022. “Presidential Use of Centralization and Politicization” https://dataspace.princeton.edu/handle/88435/dsp01qv33s0795]

Since this is the first agency-based measure of centralization, it is difficult to directly validate. However, it is noteworthy that this measure does appear to follow several trends that align with reasonable expectations for centralization, lending legitimacy to the measure. For example, highly technical, statutorily independent agencies, like the Nuclear Regulatory Commission, tend to report the lowest levels of centralization across administrations. Meanwhile, respondents in less statutorily independent departments and agencies that are also perceived to be more liberal, such as the EPA, report higher centralization under the Trump than Obama administrations. Finally, the Obama administration appears to have focused centralization efforts on areas of priority for his campaign/administration, such as pubic service (US AID; CNCS), or those suffering from scandal (GSA; VA). Additional details, including agency averages for the Bush administration, descriptive statistics by administration, and a screenshot of the survey question, can be found in the Appendix.

The second new measure of centralization comes from the most recent edition of the SFGS. It more directly contrasts centralization with delegation and asks specifically about centralizing the agency's policy-making agenda. The prompt presents respondents with a sliding scale in response to the question, In [your agency], who tends to set the policymaking agenda?" The scale places "Agency senior leaders" on one side and "White House" on the other side, with "Equal influence" in between. For those who served in previous presidential administrations, the question was also posed for the Obama and Bush administrations, respectively. The agency averages for the Trump and Obama administrations are included in Figure 3.2 below.

This measure is similar to the first, but differs in important ways. First, respondents are asked to directly contrast White House and agency influence, while in the previous measure the two avenues of influence were asked separately. This should prime respondents to think more specifically about the centralization-delegation decision. A strong downside to this measure, however, is that it relies on several-year-old recollections, which may cause bias. The proportion of respondents who either were not asked about previous administrations or chose not to respond also substantially limits the sample size, which was already substantially smaller in the most recent survey, with over one third of respondents not answering for the Obama administration and over one half for the Bush administration. That being said, it does correlate fairly strongly with the policy influence centralization measure and once again aligns with reasonable expectations, with independent agencies such as the Federal Trade Commission and Nuclear Regulatory Commission scoring very low in centralization, while the Trump administration EPA is rated as the most centralized agency. On average, respondents in the Trump administration reported higher levels of centralization than those in the Obama administration, 2.85 to 2.68, respectively.

#### It’s not too late---expertism is key for independence and credibility

Ahn et al. 25 [Alan Ahn; Master of Arts in Law and Diplomacy from Tufts, Director of Programs and Communication at the Global America Business Institute. Rowen **Price**; Senior Policy Advisor for Nuclear Energy. Matthew **Parker**; Master of Public Policy, concentrating in International Security and Economics from University of Maryland, Policy Advisor for Nuclear Energy, Sept. 11 2025, “NRC Reform, The Right Way.” Third Way, https://www.thirdway.org/blog/nrc-reform-the-right-way]

US energy demand is skyrocketing. For the nuclear sector to succeed in delivering reliable energy and economic opportunity, the US needs a trustworthy, efficient, and globally respected Nuclear Regulatory Commission (NRC). Under the direction of Congress’s bipartisan Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act, the NRC has begun the process of reform to flexibly meet the licensing needs of the next generation of American reactors.

One of the Trump administration’s four executive orders (EOs) on nuclear energy emphasized the ADVANCE Act’s direction for the NRC and set an ambitious goal of quadrupling nuclear energy growth by 2050. But the administration has since taken actions that undermine the NRC’s independence, credibility, and effectiveness—limiting its ability to support that goal. To ensure the NRC can safely and efficiently approve proposed reactors to meet American energy demand, the administration must lean on the NRC’s decades of expertise.

It’s Not Too Late to Course-Correct

An independent regulator staffed by dedicated, impartial experts is the foundation upon which the nuclear sector rests. American nuclear energy has reached a critical point—public support for nuclear power has reached new heights, and hyperscalers need the 24/7 power that nuclear provides. Perhaps more than ever, private industry, the public, investors, and the nation need confidence in the regulatory process.

While there have already been serious ramifications from the administration’s observed and reported actions at the NRC, it is not too late for the administration to reverse course. The administration must take immediate steps to restore the agency’s independence, preserve its technical capacity, and unleash an American nuclear energy revival. The following core principles should inform the administration’s implementation of Congressionally-mandated reforms:

Keep the NRC at the forefront of nuclear licensing: Neither DOD nor DOE have the capacity, institutional knowledge, relationships, or specialized expertise to license commercial power reactors at scale. While leveraging the capabilities of the Defense and Energy Departments to catalyze deployment, as is highlighted in the EO, is vital, these agencies are not substitutes for NRC licensing. In specific applications, it may be appropriate for these Departments to continue authorizing specialized reactors (e.g., national labs, military forward-deployed environments) in close coordination with the NRC. Therefore, regardless of the location or application, the NRC should be at the forefront of licensing coordination.

Remove the OMB bottleneck: Funneling all NRC decisions through the Office of Information and Regulatory Affairs (OIRA) within the Office of Management and Budget (OMB) undermines the agency’s independence, generates more regulatory uncertainty, and ultimately hands off final say to an office with little nuclear expertise. According to NRC Chair Wright, OIRA has already reviewed significantly more decisions than in years past, increasing the chances of gridlock and extending licensing timelines. For the NRC to respond nimbly to industry needs, it must avoid additional layers of bureaucracy and keep OIRA referrals to the minimum extent necessary.

Prevent indiscriminate DOGE cuts: Quadrupling US nuclear generating capacity by midcentury (while also supporting international markets and promoting US nuclear exports) means there is very little margin for error, and very little time to waste. The NRC’s aging workforce, recent hiring freezes, and loss of technical experts and senior executives further compound capacity issues at the agency. Meeting the administration’s nuclear ambitions means strategically preserving existing staff and quickly scaling up (i.e., increasing the size of “certain functions,” per the EO). Ill-conceived workforce reductions or wholesale regulatory revisions by inexperienced DOGE detailees would be disastrous for the agency and the broader US nuclear sector.

Seek efficiencies using existing authorities: Congress has given the NRC tools under the ADVANCE Act and the Nuclear Energy Innovation and Modernization Act to modernize and reform the agency, and the NRC is working in good faith to implement those reforms. Even with these regulatory reforms, the administration can still improve the function of the agency. For example, the NRC can leverage authorities and pathways already available, such as the Non-Power Production or Utilization Facility License Renewal rulemaking. That would be less intensive in terms of time, effort, and resources.

It is also important to acknowledge Congress’s jurisdiction over these matters. The administration’s actions have undermined the legislative branch’s role in providing direction to the NRC. The future of nuclear and the health of our democratic system hinges on the separation of powers.

Conclusion

The administration has started down a troubling path when it comes to NRC’s independence, authority, and capacity, but it’s not too late to change course. Nuclear has gained significant momentum over the last several years, and the NRC is working hard to meet the moment. The tools are already there to ensure the NRC is equipped to reform its approach to nuclear licensing and regulation. Undermining that effort risks losing Americans’ faith in the nuclear enterprise as a whole. The Trump administration must take this opportunity to strengthen—not undercut—the NRC’s role in supporting a robust American nuclear energy sector.