# 1NC

## 1NC---Oil

#### Contention one is oil.

#### Multiple indicators confirm the economy is stable despite market uncertainty---pessimistic predictions are driven by politics and not empirics.

Matthew Fox, 3-26-2025, "Stagflation fears are rising. Here's why one firm says it's an unlikely outcome for the economy.", archive.ph, <https://archive.ph/1p6er> [Matt covers macro research and stock market news at Markets Insider. He contributes to the markets and investing teams. Previously, Matt worked as an investment research analyst and equity portfolio manager at a +wealth management firm. Matt started his career as a financial reporter at theflyonthewall. Matt joined Insider in April 2020 and is a Chartered Market Technician (CMT).] DOA: 3/29/2025

Fears of stagflation hitting the US economy are rising. The dire economic scenario, in which inflation rises while economic growth deteriorates and unemployment surges, would be a flashback to the 1970s for America. That time period proved to be a brutal lost decade for the US stock market. But Sonu Varghese, global macro strategist at Carson Group, sees little risk of stagflation occurring anytime soon. "Folks, we are far from stagflation," Varghese said in a recent note. Inflation concerns are overblown Consumer sentiment has soured since President Donald Trump's inauguration in January, partly because of concerns that tariffs will drive a rebound in inflation. However, Varghese says that higher inflation expectations among consumers are more of an expression of political dissatisfaction than a view of actual economic conditions. "The increase in inflation expectations would typically be very concerning for the Federal Reserve, but other surveys don't show a similar surge," Varghese said, pointing to the New York Federal Reserve's consumer survey and the Atlanta Fed's business expectations survey. In addition, wage growth, a key inflationary pressure, is hovering near pre-pandemic trends that were consistent with low inflation. Annualized wages rose 3.6% for all private workers over the past three months, compared to the pre-pandemic trend of 3.1%. "Forget stagflationary levels of inflation, this pace of wage growth is consistent with 2% inflation," Varghese said in a recent note. Oil isn't moving higher One of the big shocks of the stagflation crisis in the 1970s was surging oil prices. "Energy price shocks tend to drive upside inflation shocks and right now, we don't have anything close to that," Varghese said. That's not happening now. At just below $70 a barrel, US crude oil is trading at levels last seen in 2018. WTI Crude Oil prices since 2018 Oil prices are trading near their 7-year average of $68.34 oil price chart WTI Crude Oil, weekly closing prices Average oil price since 2018 2019 2020 2021 2022 2023 2024 2025 0 20 40 60 80 100 $120 Covid pandemic sends oil prices plunging Oil prices surge after russia invades ukraine Source: Bloomberg Matt Fox/BI With US oil production near record levels and OPEC scaling back its production cuts, there's no sign that oil prices will surge in the near future. The labor market is holding up While there's been a slowdown in hiring, partially driven by the uncertainty coming out of Washington, D.C., the unemployment rate is essentially at a standstill at about 4.1%, which is historically low. Related stories Stagflation can be worse than recession. Investors are already bracing for it. Recession alarms are ringing on Wall Street. Here are 4 warnings economists are pointing to. "Overall layoffs are running lower than where they were before the pandemic, and even if you normalize for the large workforce we have now, the 'layoff rate' is 1%, below the 1.2-1.3% range we saw prior to the pandemic," Varghese explained. While the data can always change, and DOGE is fueling fears of future labor-market weakness, there are no signs that stagflation is on the horizon, Varghese said.

#### But, increased investment in net-zero emissions kills the oil industry.

IEA, 11-xx-2023, "The Oil and Gas Industry in Net Zero Transitions – Analysis", IEA, <https://www.iea.org/reports/the-oil-and-gas-industry-in-net-zero-transitions> [Since 2015, the IEA has opened its doors to major emerging countries to expand its global impact, and deepen cooperation in energy security, data and statistics, energy policy analysis, energy efficiency, and the growing use of clean energy technologies.] DOA: 3/22/2025 //RRM

* NZE = Net Zero

The smaller opportunity for exports causes international oil and gas prices to fall and a number of export-oriented producers are forced to reduce production.4 In 2040, a 4 mb/d reduction in production by exporters would mean the oil price for exporters would fall to around USD 20/barrel in 2040. OPEC’s share of the oil market in this case is 39% in 2040 and 41% in 2050, much lower than the levels seen in the NZE Scenario (44% in 2040 and 51% in 2050). This case would see a major fragmentation of international oil and gas markets. Importers choose to forego cheap oil and gas available on the market to protect their domestic oil and gas industry. The overall cost for oil and gas supply is also much higher than in the NZE Scenario. To 2050, cumulative capital and operating costsfor oil and gas supply is around USD 1 500 billion higher than in the NZE Scenario (a 25% increase). This case also includes some potential policy inconsistencies, with importers looking to protect – or even subsidise – domestic oil and gas companies even as they rapidly scale up clean energy investment and move away from fossil fuel use. 4 High-cost exporters are assumed only to reduce production designated for export so that they can always meet their own consumption with domestic production to avoid becoming net importers. Egypt India China Russia Saudi Arabia Canada -1.0 -0.5 0 0.5 1.0 1.5 Oil Africa Asia Pacific Eurasia Europe Middle East North America C & S America mb/d India China Russia Qatar United States Mexico -60 -30 0 30 60 90 Natural gas bcm IEA. CC BY 4.0 Chapter 1 | Oil and gas in net zero transitions 57 1 Conclusions The cases examined here highlight that different supply pathways are possible in a net zero emissions world (Figure 1.28). In general they achieve their starting aims, but they also see major potential downsides for producers, markets and net zero transitions. Figure 1.28 ⊳ Differences in oil and gas production from the NZE Scenario in the sensitivity cases, 2040 IEA. CC BY 4.0. Changes in preferences can reshape oil and natural gas production across regions, but increases in one part of the world must be matched by faster declines elsewhere. Note: C & S America = Central and South America.  In the low-income preference case, oil and gas production in low-income countries is around 4.5 mb/d and 300 bcm higher in 2050 than in the NZE Scenario. But in the context of oil and gas prices in the NZE Scenario, many of these new projects would fail to generate a reasonable return and could become stranded assets.  In the emissions preference case, emissions from oil and gas operations are reduced globally by around 200 Mt CO2-eq in 2030. But this reduction is much smaller and more expensive than the reduction in emissions in the NZE Scenario, in which producers undertake targeted action to reduce their emissions intensity and emissions are cut by 2 200 Mt CO2-eq in 2030.  In the cost preference case, the total cost of supplying oil and gas to 2050 is 7% lower than in the NZE Scenario. But this case sees a further concentration of production – already visible in the NZE Scenario – among a small number of countries, and so may lead to heightened security of supply concerns. This case also sees lower commodity prices than in NZE Scenario and some producer economies would likely struggle to withstand the impacts on their fiscal balances. - 6 - 3 0 3 6 Cost Emissions Low-income Energy security Oil mb/d bcm - 300 - 150 0 150 300 Natural gas Africa Asia Pacific Europe Eurasia Middle East North America C & S America Other IEA. CC BY 4.0 58 International Energy Agency | Special Report  In the security preference case, most countries successfully cut their reliance on imports, and global oil and gas imports in 2030 are around 20% lower than today (compared with a 13% drop in the NZE Scenario to 2030). But achieving this would lead to a major fragmentation of international oil and gas markets, and means the cost of supplying oil and gas is around 25% greater than in the NZE Scenario to 2050. A key assumption in the sensitivity cases is that overall demand levels do not change, with increases in production above the levels in the NZE Scenario by some countries matched by an identical level of reductions by others. Commodity prices could be the intermediary to allow for this, with new developments in one part of the world leading to lower prices and reductions in production in other parts of the world. Avoiding an increase in demand, however, may require policies to be further tightened above what already occurs in the NZE Scenario and there is a risk that this would not happen. Some of the cases examined would also imply a breakdown in international oil and gas markets as they are today, and it is not clear if prices would send a clear enough signal to avoid overproduction. Figure 1.29 ⊳ Selected security, cost and revenue indicators in the NZE Scenario and supply-side sensitivity cases IEA. CC BY 4.0. The cases examined involve trade-offs between security, cost and oil and gas revenue in low-income countries. The NZE Scenario aims to chart a middle ground between these. A world with rapidly declining oil and gas demand will inevitably involve trade-offs and compromises for producers and consumers between cost, security, emissions and equity concerns. In the NZE Scenario, the supply-side dynamics are based on the assumption that there is no development of new long lead time upstream conventional projects and that prices rapidly fall to the operating costs of the marginal project. While there is no single answer, this assumption means the NZE Scenario charts a middle ground between a number of the various trade-offs that exist (Figure 1.29). 1 2 3 4 Trillion USD (2022) Cumulative revenue in low income countries to 2050 NZE Low-income Emissions Cost Security 150 200 250 300 Billion USD (2022) Annual average oil and gas investment to 2050 45% 50% 55% 60% OPEC share in 2050 IEA. CC BY 4.0 Chapter 1 | Oil and gas in net zero transitions 59 1 The above analysis focuses on the NZE Scenario, but many of the considerations also apply in the context of the APS. For example, in the APS, investment to reduce the emissions intensity of existing operations is still a more effective way to reduce GHG emissions than developing new fields. New conventional crude oil and gas developments are required in the APS, but with falling oil and gas demand there could still be intense competition for market share. Increases in production in one part of the world would likely require reductions elsewhere to avoid making the later stages of the transition even more challenging. All producers can make arguments as to why their resources should be developed over others. In net zero transitions new project developments are, however, likely to face major commercial risks. Producers looking to undertake new resource developments need to explain how their plans are viable within a global pathway to net zero emissions by 2050 and be transparent about how they plan to avoid pushing this goal out of reach. 1.7 Investment Total energy investment in 2023 is estimated to be USD 2.8 trillion. Of this, around USD 1.8 trillion will be invested in clean energy, and USD 1 trillion in oil, gas, and coal (including extraction, refining, transmission and distribution, and power plantsthat use these fuels). Both the APS and NZE Scenario see a major increase in clean energy investment, rising to USD 3.1 trillion in 2030 in the APS and to USD 4.2 trillion in the NZE Scenario (Figure 1.30). This boost in clean energy investment is the principal driver behind the drop in fossil fuel use that can be achieved while ensuring there is no shortfall in meeting energy service demands. Figure 1.30 ⊳ Investment in clean energy and fossil fuels by scenario IEA. CC BY 4.0. In the NZE Scenario annual fossil fuel investment drops by USD 500 billion to 2030 while clean energy investment increases by more than USD 2 trillion. Note: 2023e = estimated values for 2023. 1 2 3 4 5 2023e STEPS APS 2030 NZE 2023e STEPS APS 2030 NZE Power Supply End use Energy efficiency Coal Oil Natural gas Trillion USD (2022, MER) Clean energy Fossil fuels IEA. CC BY 4.0 60 International Energy Agency | Special Report In the APS, investment is needed in both new and existing oil and gas projects: oil and gas investment in 2030 is around USD 650 billion, around 20% less than the expected level in 2023 (Figure 1.31). In the NZE Scenario, investment shifts entirely to maintaining production at existing fields, and to reducing the emissions intensity of oil and gas operations. Investment in oil and gas supply falls to USD 400 billion in 2030, half of the level in 2023. In both the APS and the NZE Scenario, the increase in clean energy investment is assumed to be synchronised with the scaling back of investment in fossil fuels. In reality, mismatches in investment levels are likely, and both over- and underinvestment in oil and gas could have important consequences for net zero transitions. Figure 1.31 ⊳ Investment in new and existing fields by scenario IEA. CC BY 4.0. Investment in oil and natural gas supply declines from current levels in both the APS and NZE Scenario. Capital spending in the NZE Scenario is focused entirely on existing fields. 1.7.1 Risks from overinvestment Overinvestment could occur if the oil and gas industry invests for long-term growth in demand that does not materialise. This risk has always been a feature of oil and gas markets, but net zero transitions – and the prospect of long-term structural declines in oil and gas demand – would present a new and pervasive set of risks and uncertainties. In such a situation, oil and gas prices would fall and new projects would face major commercial risks and may fail to recover their upfront costs. Existing projects could be at risk if oil and gas prices remain below operating costs for a prolonged period. Moreover, it could lead to difficulties for producer economies in which oil and gas sales make up a significant share of exports and fiscal revenues. Overinvestment in supply also risks locking in emissions that could push the world over the 1.5 °C threshold. This could be avoided by governments adopting resilient policies that prevent a drop in prices feeding through into a rebound in oil and gas demand. But in practice 100 200 300 400 2023e 2030 2050 2030 2050 2023e 2030 2050 2030 2050 Oil Natural gas Oil Natural gas Billion USD (2022, MER) Exisiting fields: New fields: APS NZE APS NZE IEA. CC BY 4.0 Chapter 1 | Oil and gas in net zero transitions 61 1 this may be difficult to stop. Additional emissions from new projects would therefore need to be compensated by even more robust emission reductions in the latter years of our projections to achieve net zero emissions by 2050. Assessing the risks of stranded assets A reduction in oil and gas production and prices could lead to widespread losses for the oil and gas industry and to stranded assets. There are multiple strands to this debate and it is therefore useful to distinguish between different impacts and losses that could be incurred by the oil and gas industry. In particular, it is helpful to distinguish between:  Stranded volumes: existing fossil fuel reserves that are left unexploited as a result of climate policies.  Stranded capital: capital investment in fossil fuel infrastructure that is not recovered over the operating lifetime of the asset because of reduced demand or reduced prices resulting from climate policies.  Stranded value: a reduction in future revenue generated by an asset or asset owner, as assessed at a given point in time, caused by reduced demand or reduced prices resulting from climate policies. The world currently has around 1.8 trillion barrels of oil and 220 trillion m3 of natural gas 2P reserves. With reasonable assumptions on possible deployment rates of CCUS and negative emission technologies such as DACS and BECCS, a large proportion of these reserves cannot be combusted if the temperature rise is to be limited to well below 2 °C or 1.5 °C. For example, in the NZE Scenario around 30% of today’s oil and natural gas reserves are produced by 2050. However, this does not necessarily mean that large volumes of reserves will be “stranded”. In the STEPS, around half of oil and gas reserves are produced to 2050. In other words, a large amount of existing oil and gas reserves will not be used even under much higher temperature outcomes. There is undoubtedly a large difference in fossil fuel use between the scenarios, but the assessment of risks to the industry is better focused on investment and value losses rather than reserves. In the NZE Scenario, despite the sharp reductions in demand, the risk of stranded capital is relatively low as it is mitigated by production decline rates that are consistent with no further investment in new projects. Some fields are closed before the end of their technical lifetimes, but most of these projects will have recovered their upfront capital by the time shut-in risks appear. In the upstream sector, stranded capital risks therefore exist primarily in the form of the sunk costs incurred in exploring for resources that are not ultimately developed in the NZE Scenario; we estimate that this amounts to around USD 400 billion in total

#### And, it risks broader economic decline during the mid-transition period.

Etienne Espagne et al., 9-7-2023, "Cross-Border Risks of a Global Economy in Mid-Transition", IMF, <https://www.imf.org/en/Publications/WP/Issues/2023/09/08/Cross-Border-Risks-of-a-Global-Economy-in-Mid-Transition-538950> [Étienne Espagne is a senior climate economist at the World Bank EFI chief economist office and an associate researcher at CERDI. William Oman is an economist at the International Monetary Fund, where my work within the Monetary and Capital Markets Department focuses on climate- and nature-related financial risks, macro-finance, and central banking. Previously, I worked in the IMF's European Department and IMF Europe Office, where my responsibilities included surveillance on the euro area, France, Malta, and Spain, as well as IMF engagement with the OECD, the ECB, and the European Commission. Dr. Jean-Francois Mercure is Senior Economist at the World bank and Associate Professor in Climate Policy at the Global Systems Institute, University of Exeter, UK. Romain Svartzman completed his PhD in ecological macroeconomics at McGill University (Canada). He also holds a master’s degree in Finance from the Institut d’Etudes Politiques de Paris (Sciences Po) and a degree in Economics and Law of Climate Change from FLACSO Argentina. Ulrich Volz: MSc, PhD (FU Berlin). Hector Pollitt is a director and head of Modelling at Cambridge Econometrics, with extensive experience in the development and application of macroeconomic modelling tools for impact analysis. He holds overall responsibility for maintenance of CE’s global E3ME model. Gregor Semieniuk is an Assistant Professor of Public Policy and Economics. His research focuses on the energy and resource requirements of global economic growth and on the political economy of rapid, policy-induced structural change that is required for the transition to a low-carbon economy. Gregor has published on these topics including in Nature Climate Change and Nature Energy, consulted for the United Nations Environment Program, the European Commission and the UK government, and won grants to study policies inducing investments into renewable energy supply as well as the risks for financial investors from stranded assets in a fast low-carbon transition. He holds a Ph.D. in Economics from the New School for Social Research. Emanuale Campiglio: Associate Professor at the University of Bologna - Department of Economics Scientist at the RFF-CMCC European Institute on Economics and the Environment Visiting Fellow at the London School of Economics and Political Science - Grantham Research Institute] DOA: 3/27/2025 //RRM

A consistent analytical framework for the cross-border economic and financial risks associated with a world economy in this critical mid-transition period is needed.3 The existing literature on the macroeconomic effects of climate mitigation policies often simplifies nation-level challenges and policy contexts with the goal of seeking simple narratives that apply at the global level (Riahi et al., 2022; Masson-Delmotte et al., 2018; Van Vuuren et al., 2020; Rogelj et al., 2018; Grubler et al., 2018). Developed as general basis scenarios of globally coordinated decision-making and cost-effective economic evolution, this literature sheds little light on the links between the transition and the structural transformation of the global economy. While a growing body of literature examines the cross-border effects of the physical impacts of climate change, we are unaware of any systematic analysis of the cross-border impacts of decarbonization in a mid-transition context.4 The paper’s three main contributions are as follows. First, we draw on a range of stylized facts to show that global decarbonization will very likely change the structure of international trade and capital flows. Second, we propose an analytical framework to analyze these effects that is based on a system dynamics approach. Third, we assess a subset of the likely impacts of global decarbonization that we outline, notably those on output and trade, under specific global decarbonization assumptions. Our analysis suggests that, among the world’s largest economies, China, India and Japan are likely to benefit the most from the transition, while Russia, Saudi Arabia the U.S. could be negatively affected relative to a hypothetical baseline of baseline GDP growth. While this paper seeks to draw the attention of the research and policy communities to cross-border transition risks, it does not imply any minimization of the major opportunities associated with the transition – and the counterfactual of an absence of transition implies far greater risks than those we analyze here. Opportunities include economic growth, notably in the short run as low-carbon infrastructure is developed, as well as job creation, innovation, and many environmental and health co-benefits (see, e.g., Bhattacharya et al., 2021). A counterfactual “no (or failed) transition” scenario, where fossil production and consumption are not significantly reduced would imply a host of major cross-border risks, in particular those stemming from the economic and financial consequences of an accelerated deregulation and destabilization of the Earth system. The rest of this paper is organized as follows. Section 2 highlights several stylized facts that are relevant for assessing cross-border risks during the mid-transition period. Section 3 proposes a taxonomy of country-level cross-border risks. Section 4 analyzes potential cross-border impacts that result from shifting trade, energy, and employment patterns, quantifying some of them using the E3ME-FTT global macroeconomic model. Section 5 explores the potential international macroeconomic and financial spillovers that cross-border mid- 2 As documented by Fressoz (2022), the concept of “energy transition” first appeared in 1967 in response to the threat of energy resource shortages, and in 1982 to make the case for the need to invest in nuclear energy as a contingency option to rapidly decarbonize the global energy system if a climate catastrophe were to appear likely. Geels and Turnheim (2022), meanwhile, use the term “transition” to refer to a technological transformation that may not necessarily be entirely driven by a climate goal, making use of a historical perspective looking at where transitions have occurred before and the conducing factors. Here, the mid-transition that we describe does not necessarily imply a sufficiently rapid decarbonization of the world economy to avoid climate change of 2°C or more. 3 The paper essentially abstracts from the macroeconomic effects of physical risks of climate change, including those that could adversely impact the global low-carbon transition. 4 See the recent study by Carter et al. (2021) for a conceptual framework for cross-border impacts of the physical effects of climate change. On cross-border impacts of physical climate change, see also Adams et al. (2021), Benzie et al. (2019), Bailey and Wellesley (2017), Challinor et al. (2017, 2018), Hedlund et al. (2018), Otto et al. (2017), Schenker (2012), Smith et al. (2018), Volz et al. (2020), and Feng and Li (2021). Laybourn et al. (2023) argue that societal reactions to worsening physical climate impacts could create destructive dynamics whereby societies are increasingly distracted by the symptoms of the crisis, deepening its consequences and generating a doom loop. IMF WORKING PAPERS Cross-Border Risks of a Global Economy in Mid-Transition INTERNATIONAL MONETARY FUND 5 transition risks could cause. Section 6 provides a summary of the findings and concludes with reflections on the scope for future research. 2. Stylized Facts to Inform Mid-Transition CrossBorder Risk Analysis This section covers current technological and structural transformation trends, global macroeconomic and financial patterns observed in the recent past, and specific price dynamics that arise with mid-transition crossborder risk scenarios. 2.1. Stylized Facts for a Mid-transition Period The world economy could become exposed to higher uncertainty and instability as a result of the parallel emergence of low-carbon technologies and persistence of fossil-based infrastructures. These parallel and contradictory trends open a potentially lengthy mid-transition period, when the fossil-based energy system will coexist with the emerging low-carbon energy system, while being increasingly impacted by increasing climate damages. As noted in the introduction, we borrow the “mid-transition” term from Grubert and Hastings-Simon (2022). As these authors note, each energy system – the old and the emerging – imposes operational constraints on the other. This coexistence means that the emerging low-carbon energy system will face fossil system constraints. This “mid-transition” will therefore require “decision-making under dynamic and uncertain conditions.” There is a substantial low-carbon energy investment shortfall for reaching global average temperature objectives, with some estimates putting the clean energy shortfall at nearly US$3 trillion per year (IEA, 2022a), alongside a potential investment excess or shortfall in fossil systems (reflecting increasing market uncertainty and uncoordinated expectations). The potential for instability could therefore become considerable. During that period, as shown in Figure 1, different sources of instability and uncertainty are likely to materialize, with opposite effects on the transition. Figure 1. Stylized Representation of the Unstable Mid-Transition Period Note: Stylized view of the possible volatility and instability of paths for market shares of high- and low-carbon capital through the middle phase of a low-carbon economic transformation, as low-carbon industries rise rapidly concurrently to a high-carbon industry decline. IMF WORKING PAPERS Cross-Border Risks of a Global Economy in Mid-Transition INTERNATIONAL MONETARY FUND 6 The first key trend is that low-carbon technological change is underway, affecting conventional fossil markets. Technology data show that decarbonization is well underway in several key sectors and countries (power, transport in the EU and China) but only nascent in others (industry, heat; see IEA 2022b; Mercure et al., 2021). Established high-carbon systems and economic structures may be disrupted by ongoing low-carbon technological change and innovation (Tong et al., 2019). The transition towards low-carbon energy generation and use is a self-reinforcing process, in which deployment decreases costs, which facilitates further deployment (Way et al., 2022, Mercure 2012, Mercure et al., 2014, Arthur, 1994; Unruh, 2000). Tipping points past which diffusion becomes irreversible could be near or already past (Sharpe and Lenton, 2021), notably towards solar energy (Nijsse et al., 2023) and electric vehicles (Lam and Mercure, 2022). The prospect of a dominance of solar energy and electric vehicles has stark implications for the value of high-carbon assets (Semieniuk et al., 2022). Emerging market and developing economies (EMDEs) could become markets for low-carbon technologies even with limited government capacity to implement climate policies. Diminishing cost through broader adoption of these technologies could in turn mitigate the potentially negative current account effects for EMDEs of importing low-carbon technologies. In the longer run, the main cross-border risk from increasing renewables installation globally is a declining demand for and trade in fossil fuels, and the potential for stranded fossil assets and related capital and infrastructure, concurrent with increased trade in and declining costs of low-carbon technology.5 At the same time, the emergence of uncoordinated low-carbon industrial policies by the world’s largest economies highlights the importance of resilient low-carbon supply chains as a key policy objective. China has a long-standing national planning strategy, based on Five-Year Plans, while the U.S. has turned to explicit, climate-oriented industrial policy through the Inflation Reduction Act. In contrast to the U.S. and China, the EU’s approach to industrial policy – with the “Fit for 55” climate transition plan, REPowerEU, and EU Green Deal Industrial Plan and Net Zero Industry Act – emphasizes the principle of free trade and the need to abide by WTO rules, maintain competitive markets, and deepen the EU’s internal market. These industrial policies interact with geoeconomic fragmentation, and could either amplify or mitigate it. In parallel to these decarbonization trends, investment in unabated fossil generation remains high, on a par with its 2016 level (IEA, 2023; IMF, forthcoming a), with significant volatility in prices. If and when the transition gains momentum, a large amount of assets – notably fossil assets – could become stranded if investment exceeds perceived future needs (Pfeiffer et al., 2018; Mercure et al., 2018a, 2021; Semieniuk et al., 2022, van der Ploeg and Rezai, 2020).6 However, price spikes could occur in the opposite scenario if stranded assets are excessively anticipated and investment collapses prematurely. Hence, this points to a case for international coordination and regulation policies within climate policy frameworks (CFMCA, 2023; Krogstrup and Oman, 2019). Supply-demand imbalances could lead to significant volatility in oil and gas markets, in part generated by instability in market regimes motivated by geopolitics (Van der Graaf and Bradshaw, 2018), affecting a wide range of activities and assets, from manufacturing to services. In 2022, short term supply shocks such as the Russian reduction of gas exports to Europe and the G7 sanctions hitting Russian oil exports were complemented by a shift in oil producer strategy to maximize shareholder value rather than production and speculation (Weber and Wasner, 2023; Breman and Storm, 2023). Such volatility can be expected to persist as the market declines and investment and demand coordination becomes harder. However, until the oil market is firmly in decline, stranded assets are likely to be invested in as the high profits in a shortage period induce oil companies to expand investment in order to partake in the short-term profit boom. But since the resulting assets are long-lived, they are vulnerable to subsequent stranding. The European 5 Broadly speaking, stranded assets can be defined as investments that stop returning a profit before the end of their life cycle. 6 Current expectations, as shown by the limited pricing of climate risk in the banking sector (Beyene et al., 2021), are clearly not aligned with the Paris Agreement, particularly in the banking sector. IMF WORKING PAPERS Cross-Border Risks of a Global Economy in Mid-Transition INTERNATIONAL MONETARY FUND 7 oil majors’ recent adjustment of their transition plans, and OPEC's upward revision of its 2045 global oil demand projection upward from 100.6 to 110 million barrel per day in an interval of only 9 months (OPEC, 2022; Reuters, 2023), suggest this dynamic is at play. Furthermore, the value of fossil exports and imports may not necessarily be replaced by trade in other commodities, which could determine the stance of countries on climate action. In particular, the prospect of declining demand for oil and gas and resulting disproportionate macroeconomic impacts on producing countries could drive geopolitical conflict or political maneuvers aiming to capture larger shares of declining markets at the expense of other producers. Electricity is not an easily traded commodity since long-distance transport requires expensive interconnectors and transmission lines (which can be exposed to weather and climate extreme events), whereas most countries have substantial renewable energy potential over their territory that enable local electricity production (Mercure and Salas, 2012). International trade in green hydrogen is emerging but will unlikely match today’s volumes of trade in fossil, given that it is not used in as many applications nor with volumes of the same size (IRENA, 2022). Moreover, net exporters of fossil and hydrogen and other renewable electricity-based energy carriers need not be the same (Berrada and Laasmi, 2021; Hank et al., 2020). Perhaps more importantly than trade in renewable energy itself, the world economy is projected to experience growth in trade in low-carbon technology/capital goods and critical minerals (Boer et al., 2021), as well as the intermediate goods and industrial equipment required to produce or refine them.

#### Decline causes nuclear war by initiating escalation throughout global hotspots.

Ellissa Cavaciuti-Wishart et al. 24, MPhil, Head, Global Risks, World Economic Forum; Sophie Heading, MA, Lead, Global Risks, World Economic Forum; Kevin Kohler, MA, Specialist, Global Risks, World Economic Forum; Saadia Zahidi, MPhil, Managing Director, World Economic Forum, "Global Risks 2024: At a Turning Point," & "Global Risks 2034: Over the Limit," in The Global Risks Report 2024, Chapter 1 & 2, January 2024, pg. 14-39. //JDi [italics in original]

Weakened systems only require the smallest shock to edge past the tipping point of resilience. In the second time frame covered by the survey, respondents were asked to rank the likely impact of risks in the next two years. The results suggest that corrosive socioeconomic vulnerabilities will be amplified in the near term, with looming concerns about an Economic downturn (Chapter 1.5), resurgent risks such as Interstate armed conflict (Chapter 1.4), and rapidly evolving risks like Misinformation and disinformation (Chapter 1.3). As discussed in last year’s Global Risks Report, less predictable and harder-to-handle inflation heightens the risk of miscalibration of efforts to balance price stability and economic growth (Chapter 1.5: Economic uncertainty). Economic risks are notable new entrants to the top 10 rankings this year, with both Inflation (#7) and Economic downturn (#9) featuring in the two-year time frame (Figure 1.3). Economic risks are prioritized in particular by public- and private-sector respondents (Figure 1.5). Geoeconomic confrontation (#14) is a marked absence from the top 10 rankings this year (Figure 1.4) and has decreased in perceived severity compared to last year’s scores. However, like related economic risks, it features among the top concerns for both public- and private-sector respondents (at #10 and #11, respectively) as a continuing source of economic volatility. [Figures omitted] Misinformation and disinformation has risen rapidly in rankings to first place for the two-year time frame, and the risk is likely to become more acute as elections in several economies take place this year (Chapter 1.3: False information). Societal polarization is the third-most severe risk over the short term, and a consistent concern across nearly all stakeholder groupings (Figures 1.5 and 1.6). Divisive factors such as political polarization and economic hardship are diminishing trust and a sense of shared values. The erosion of social cohesion is leaving ample room for new and evolving risks to propagate in turn. Societal polarization, alongside Economic downturn, is seen as one of the most central risks in the interconnected “risks network”, with the greatest potential to trigger and be influenced by other risks (Figure 1.7). [Figures omitted] Interstate armed conflict (#5) rises in the rankings for the two-year horizon, across nearly all stakeholder groups, except for government respondents. This divergence may simply reflect different views around defining conflict: interstate armed conflict in the strict definition has remained relatively rare thus far, but international interventions in intrastate conflict are on the rise (Chapter 1.4: Rise in conflict). Extreme weather events, a persistent concern between last year and this year, is at #2, Cyber insecurity at #4, Involuntary migration at #8 and Pollution at #10, rounding out the top 10 concerns in respondents’ risk perceptions through to 2026. Overall, global risks have lower severity scores compared to last year’s results.7 Further down in the two-year time frame rankings, Critical change to Earth systems comes in at #11, Debt in 16th place, and Adverse outcomes of AI technologies and other frontier technologies in 29th and last place, respectively. The following sections explore some of the most severe risks that many expect to play out over the next two years, focusing on three entrants to the top 10 risks list over the short term: Misinformation and disinformation (#1), Interstate armed conflict (#5) and Economic downturn (#9). We briefly describe the latest developments and key drivers for false information, a rise in conflict and economic uncertainty, and consider their emerging implications and knock-on effects. False information [Figure omitted] Misinformation and disinformation may radically disrupt electoral processes in several economies over the next two years. A growing distrust of information, as well as media and governments as sources, will deepen polarized views – a vicious cycle that could trigger civil unrest and possibly confrontation. There is a risk of repression and erosion of rights as authorities seek to crack down on the proliferation of false information – as well as risks arising from inaction. The disruptive capabilities of manipulated information are rapidly accelerating, as open access to increasingly sophisticated technologies proliferates and trust in information and institutions deteriorates. In the next two years, a wide set of actors will capitalize on the boom in synthetic content,8 amplifying societal divisions, ideological violence and political repression – ramifications that will persist far beyond the short term. Misinformation and disinformation (#1) is a new leader of the top 10 rankings this year. No longer requiring a niche skill set, easy-to-use interfaces to large-scale artificial intelligence (AI) models have already enabled an explosion in falsified information and so-called ‘synthetic’ content, from sophisticated voice cloning to counterfeit websites. To combat growing risks, governments are beginning to roll out new and evolving regulations to target both hosts and creators of online disinformation and illegal content.9 Nascent regulation of generative AI will likely complement these efforts. For example, requirements in China to watermark AI-generated content may help identify false information, including unintentional misinformation through AI hallucinated content.10 Generally however, the speed and effectiveness of regulation is unlikely to match the pace of development. Synthetic content will manipulate individuals, damage economies and fracture societies in numerous ways over the next two years. Falsified information could be deployed in pursuit of diverse goals, from climate activism to conflict escalation. New classes of crimes will also proliferate, such as non-consensual deepfake pornography or stock market manipulation.11 However, even as the insidious spread of misinformation and disinformation threatens the cohesion of societies, there is a risk that some governments will act too slowly, facing a trade-off between preventing misinformation and protecting free speech, while repressive governments could use enhanced regulatory control to erode human rights. Mistrust in elections Over the next two years, close to three billion people will head to the electoral polls across several economies, including the United States, India, the United Kingdom, Mexico and Indonesia (Figure 1.9).12 The presence of misinformation and disinformation in these electoral processes could seriously destabilize the real and perceived legitimacy of newly elected governments, risking political unrest, violence and terrorism, and a longer-term erosion of democratic processes. Recent technological advances have enhanced the volume, reach and efficacy of falsified information, with flows more difficult to track, attribute and control. The capacity of social media companies to ensure platform integrity will likely be overwhelmed in the face of multiple overlapping campaigns.13 Disinformation will also be increasingly personalized to its recipients and targeted to specific groups, such as minority communities, as well as disseminated through more opaque messaging platforms such as WhatsApp or WeChat.14 The identification of AI-generated mis- and disinformation in these campaigns will not be clear-cut. The difference between AI- and humangenerated content is becoming more difficult to discern, not only for digitally literate individuals, but also for detection mechanisms.15 Research and development continues at pace, but this area of innovation is radically underfunded in comparison to the underlying technology.16 Moreover, even if synthetic content is labelled as such,17 these labels are often digital and not visible to consumers of content or appear as warnings that still allow the information to spread. Such information can thus still be emotively powerful, blurring the line between malign and benign use. For example, an AI-generated campaign video could influence voters and fuel protests, or in more extreme scenarios, lead to violence or radicalization, even if it carries a warning by the platform on which it is shared that it is fabricated content.18 The implications of these manipulative campaigns could be profound, threatening democratic processes. If the legitimacy of elections is questioned, civil confrontation is possible – and could even expand to internal conflicts and terrorism, and state collapse in more extreme cases. Depending on the systemic importance of an economy, there is also a risk to global trade and financial markets. State-backed campaigns could deteriorate interstate relations, by way of strengthened sanctions regimes, cyber offense operations with related spillover risks, and detention of individuals (including targeting primarily based on nationality, ethnicity and religion).19 [Figure omitted] Societies divided Misinformation and disinformation and Societal polarization are seen by GRPS respondents to be the most strongly connected risks in the network, with the largest potential to amplify each other. Indeed, polarized societies are more likely to trust information (true or false) that confirms their beliefs. Given distrust in the government and media as sources of false information,20 manipulated content may not be needed – merely raising a question as to whether it has been fabricated may be sufficient to achieve relevant objectives. This then sows the seeds for further polarization. As identified in last year’s *Global Risks Report* (*Chapter 1.2: Societal polarization*), the consequences could be vast. Societies may become polarized not only in their political affiliations, but also in their perceptions of reality, posing a serious challenge to social cohesion and even mental health. When emotions and ideologies overshadow facts, manipulative narratives can infiltrate the public discourse on issues ranging from public health to social justice and education to the environment. Falsified information can also fuel animosity, from bias and discrimination in the workplace to violent protests, hate crimes and terrorism. Some governments and platforms, aiming to protect free speech and civil liberties, may fail to act to effectively curb falsified information and harmful content, making the definition of “truth” increasingly contentious across societies. State and non-state actors alike may leverage false information to widen fractures in societal views, erode public confidence in political institutions, and threaten national cohesion and coherence. Trust in specific leaders will confer trust in information, and the authority of these actors – from conspiracy theorists, including politicians, and extremist groups to influencers and business leaders – could be amplified as they become arbiters of truth. Defining truth False information could not only be used as a source of societal disruption, but also of control, by domestic actors in pursuit of political agendas.21 Although misinformation and disinformation have long histories, the erosion of political checks and balances, and growth in tools that spread and control information, could amplify the efficacy of domestic disinformation over the next two years.22 Global internet freedom is already in decline and access to wider sets of information has dropped in numerous countries.23 Falls in press freedoms in recent years and a related lack of strong investigative media, are also significant vulnerabilities that are set to grow.24 Indeed, the proliferation of misinformation and disinformation may be leveraged to strengthen digital authoritarianism and the use of technology to control citizens. Governments themselves will be increasingly in a position to determine what is true, potentially allowing political parties to monopolize the public discourse and suppress dissenting voices, including journalists and opponents.25 Individuals have already been imprisoned in Belarus and Nicaragua, and killed in Myanmar and Iran, for online speech.26 [Figure omitted] The export of authoritarian digital norms to a wider set of countries could create a vicious cycle: the risk of misinformation quickly descends into the widespread control of information which, in turn, leaves citizens vulnerable to political repression and domestic disinformation.27 GRPS respondents highlight strong bilateral relationships between Misinformation and disinformation, Censorship and surveillance (#21) and the Erosion of human rights (#15), indicating a higher perceived likelihood of all three risks occurring together (Figure 1.10). This is a particular concern in those countries facing upcoming elections, where a crackdown on real or perceived foreign interference could be used to consolidate existing control, particularly in flawed democracies or hybrid regimes. Yet more mature democracies could also be at risk, both from extensive exercises of government control or due to trade-offs between managing mis- and disinformation and protecting free speech. In January last year, Twitter and YouTube agreed to remove links to a BBC documentary in India.28 In Mexico, civil society has been concerned about the government's approach to fake news and its implications for press freedom and safety.29 Rise in conflict [Figure omitted] Escalation in three key hotspots – Ukraine, Israel and Taiwan – is possible, with high-stakes ramifications for the geopolitical order, global economy, and safety and security. Geographic, ideological, socioeconomic and environmental trends could converge to spark new and resurgent hostilities, amplifying state fragility. As the world becomes more multipolar, a widening array of pivotal powers will step into the vacuum, potentially eroding guardrails to conflict containment. The world has become significantly less peaceful over the past decade, with conflict erupting in multiple regions last year.30 Active conflicts are at the highest levels in decades, while related deaths have witnessed a steep increase, nearly quadrupling over the two-year period from 2020 to 2022 (Figure 1.12), largely attributable to developments in Ethiopia and Ukraine. While difficult to attribute to a single cause, longer-term shifts in geopolitical power, economic fragility and limits to the efficacy and capacity of international security mechanisms have all contributed to this surge. Interstate armed conflict (#5) is a new entrant to the top 10 risk rankings this year. Specific flashpoints could absorb focus and split the resources of major powers over the next two years, degrading global security and destabilizing the global financial system and supply chains. Although war between two states in the strict definition remains relatively rare (Figure 1.12), this could contribute to conflict contagion, leading to rapidly expanding humanitarian crises that overwhelm the capacity to respond. [Figure omitted] High-stakes hotspots Over the next two years, the attention and resources of global powers are likely to be focused on three hotspots in particular: the war in Ukraine, the Israel-Gaza conflict and tensions over Taiwan. Escalation in any one of these hotspots would radically disrupt global supply chains, financial markets, security dynamics and political stability, viscerally threatening the sense of security and safety of individuals worldwide. All three areas stand at a geopolitical crossroads, where major powers have vested interests: oil and trade routes in the Middle East, stability and the balance of power in Eastern Europe, and advanced technological supply chains in East Asia. Each could lead to broader regional destabilization, directly drawing in major power(s) and escalating the scale of conflict. All three also directly involve power(s) reckoned to possess nuclear capabilities. Over the next two years, the war in Ukraine could sporadically alternate between intensifying and refreezing. Despite sanctions, Russia has continued to benefit from energy profits and commodity exports – and this could increase further if the conflict in the Middle East widens.31 Pro-Russian or neutral sentiment in Eastern and Central Europe could soften support from Ukraine’s European allies,32 while support in the United States could wane under domestic pressures, other international priorities, or under a new government. Global divisions with respect to the Middle East conflict may also complicate efforts by Ukraine to maintain unity with Western allies, while also garnering support from the Global South.33 If the conflict intensifies, it is still more likely to do so through conventional rather than nuclear means, but it could also expand to neighbouring countries. While post-conflict scenarios for both Ukraine and Russia are difficult to predict, the war could ‘refreeze’ into a prolonged, sporadic conflict that could last years or even decades.34 Proximate developments in the Middle East are a source of considerable uncertainty, risking further indirect or direct confrontation between global powers. If the Israel-Gaza conflict destabilizes into wider regional warfare, more extensive intervention by major powers is possible, including Iran and the West.35 Beyond potentially seismic shocks to global energy prices and supply chains, escalation could split the attention and resources of the EU and the United States between Ukraine and Israel.36 The scale of Gulf countries’ or Western intervention is uncertain; it’s likely to continue to be deeply polarizing domestically and hold significant political sway. Numerous GRPS respondents also cited Taiwan and disputed territories in East and South-East Asia as areas of concern. In contrast to Russia, which doubled its defense spending target to more than $100 billion in 2023, and the United States, which allocated over $113 billion in assistance relating to the war in Ukraine alone,37 China has largely acted as a non-interventionist power in both the Ukraine and Middle East conflicts, avoiding the risk of overstretch.38 While there is no evidence to suggest that escalation is imminent, there remains a material possibility of accidental or intentional outbreak of hostilities, given heightened activity in the region.39 Conflict contagion As high-stakes hotspots undermine global security, a wider set of trends may fuel a combustible environment in which new and existing hostilities are more likely to ignite. As conflicts spread, guardrails to their containment are eroding and resolve for long-term solutions have stalled.40 In parallel, the internationalization of conflicts by a wider set of alternate powers will accelerate ‘multipolarity’ and the risk of inadvertent escalation. First, simmering tensions and frozen conflicts that are proximate to existing hotspots could heat up. For example, spillover impacts from a high concentration of conflicts, such as in Asia and Africa (Figure 1.13), could range from more readily available arms trafficking to conflict-driven migration. Other states could also deliberately stoke tensions in neighbouring countries to divert attention and resources, through disinformation campaigns or the deployment of state-backed militia groups, for example. Frozen conflicts at risk could include the Balkans, Libya, Syria, Kashmir, Guyana, the Kurdish region and Korean peninsula.41 These risks are well-recognized by business leaders: Interstate armed conflict features as a top-five risk in 20 countries (18%) surveyed in the Forum’s Executive Opinion Survey (EOS, see Appendix C: Executive Opinion Survey: National Risk Perceptions), including Egypt, Iraq, Kazakhstan and Serbia, and is the top risk in Armenia, Georgia, Kyrgyzstan and Japan. Second, resource stress, economic hardship and weakened state capacity will likely grow and, in turn, fuel conflict.42 There may also be a rise of ‘ungoverned countries’, where non-state actors fight for control over large swathes of territory, or where parties not recognized by the international system gain full control. For example, resource-rich countries could become caught in a battleground of proxy warfare between multiple powers, including neighbouring economies, organized crime networks and paramilitary groups (Chapter 2.6: Crime wave).43 [Figure omitted] Third, with instant information networks and reinforcing algorithms, the symbolism of high-stakes hotspots could trigger contagion beyond conflict geographies. Deeply ingrained ideological grievances are in some cases driving hostilities, and these divisions are resonating with communities and political parties elsewhere. This expands beyond religious and ethnic divisions to broader challenges to systems of governance. National identities, international law and democratic values are coming into question, contributing to civil unrest, threatening human rights, and reigniting violence, including in advanced democracies and between the Global North and South. North-South rift Dissatisfaction with the continued political, military and economic dominance of the Global North is growing, particularly as states in the Global South bear the brunt of a changing climate, the aftereffects of pandemic-era crises and geoeconomic rifts between major powers. Historical grievances of colonialism, combined with more recent ones regarding the costs of food and fuel, geopolitical alliances, the United Nations and Bretton Woods systems, and the loss and damage agenda, could accelerate anti-Western sentiment over the next two years. In conjunction with more thinly spread resources and tighter economic conditions, military power projection by the West could fade further, potentially creating power vacuums in parts of Africa, the Middle East and Asia. France, for example, has withdrawn troops on request from Mali, Burkina Faso and Niger over the past two years.44

#### Extinction!

Starr 22, Steven. Director of the University of Missouri’s Clinical Laboratory Science Program, as well as a senior scientist at the Physicians for Social Responsibility. He has worked with the Swiss, Chilean, and Swedish governments in support of their efforts at the United Nations to eliminate thousands of high-alert, launch-ready U.S. and Russian nuclear weapons; he maintains the website Nuclear Darkness. “Fred Reed Indicates What Nuclear War Would Be Like, but Steven Starr’s Comment Better Describes the Death of the Planet,” Oct 24, 2022, https://www.paulcraigroberts.org/2022/10/24/fred-reed-indicates-what-nuclear-war-would-be-like-but-steven-starrs-comment-better-describes-the-death-of-the-planet/

Russia has about 700 strategic nuclear warheads that each have an explosive power of 800,000 tons of TNT. These are among the “launch-ready” weapons they can launch in a few minutes time. Each of these warheads, on an average weather day, will ignite fires over an area of 150 square miles. In a matter of 10-15 minutes, these fires will coalesce into a single gigantic nuclear firestorm, with air temperatures of 500 -600 degrees Fahrenheit and hurricane force winds blowing towards the center of the fire zone. No one in the fire zone will survive the fire. For details, see an article that I co-authored in the Bulletin of the Atomic Scientists, “What would happen if an 800-kiloton nuclear warhead detonated above midtown Manhattan?”. https://thebulletin.org/2015/02/what-would-happen-if-an-800-kiloton-nuclear-warhead-detonated-above-midtown-manhattan/ A war fought with hundreds or thousands of U.S. and Russian strategic nuclear weapons would ignite immense nuclear firestorms covering land surface areas of many thousands or tens of thousands of square miles. **Peer-reviewed studies have calculated** that up to 180 million tons of **smoke and soot** would be **created by** these **nuclear firestorms**. See the https://nuclearfamine.org/ and http://climate.envsci.rutgers.edu/robock/robock\_nwpapers.html for details. Most of the smoke from these firestorms would rapidly rise above cloud level into the stratosphere, where it would rapidly spread around the earth. In a matter of a few weeks, a global stratospheric smoke layer would form, which **would block** up to 70% of warming **sunlight** from reaching earth’s surface in the Northern Hemisphere and 35% in the Southern Hemisphere. The smoke, being above cloud level, could not be rained out and it would remain in the stratosphere for a decade or longer. The loss of warming sunlight would cause daily temperatures to fall below freezing every day for up to 3 years in central North American and central Eurasia. The intense cold weather would endure for many years, **preventing crops from being grown**. Most **humans and animal populations would perish from starvation**. Unfortunately, those in charge of the US military have rejected the findings of the scientific studies on nuclear winter. I wrote about this for the Federation of American Scientists, see “Turning a Blind Eye Towards Armageddon — U.S. Leaders Reject Nuclear Winter Studies” at https://fas.org/2017/01/turning-a-blind-eye-towards-armageddon-u-s-leaders-reject-nuclear-winter-studies/ In 2010, at the UN meetings of the First Committee, I asked Rose Gottemoeller and Anatoly Atonov (during their briefing on New START) if they were familiar with the new studies on nuclear winter, which predict that a US-Russian nuclear war would wipe out most of humanity. Both answered “no”. Perhaps they have learned more about nuclear winter since 2010. But it is willful blindness to chose to ignore such information and criminal insanity to start a **nuclear war** that **would amount to** a mass **extinction** event.

#### And, it locks in carbon emissions.

Don Grant et. al, 8-29-2024, "A worldwide analysis of stranded fossil fuel assets’ impact on power plants’ CO2 emissions", Nature, <https://www.nature.com/articles/s41467-024-52036-8> [Grant: Department of Sociology, University of Colorado Boulder, Boulder, CO, USA Renewable and Sustainable Energy Institute, University of Colorado Boulder, Boulder, CO, USA. Hansen: Department of Environmental Studies, Dartmouth College, Hanover, NH, USA. Jorgenson: Department of Sociology, University of British Columbia, Vancouver, BC, Canada Department of Theoretical Economics, Vilnius University, Vilnius, Lithuania. Longhofer: Goizueta Business School, Emory University, Atlanta, GA, USA] DOA: 4/1/2025 //RRM

* Green Paradox: policies meant to reduce emissions cause spikes in emissions
* Stranded assets: assets that cannot produce revenue before the end of their lifetime

The baseline model (model 1) reveals that plants release more carbon when they emitted at high levels in 2009, use coal or gas as their primary fuels, have more electrical capacity, use a higher percentage of their capacity, and have capacity utilization rates that have increased over time. Plants also emit more carbon in countries that are highly dependent on the fossil fuel industry to generate power. After accounting for the effects of these and other controls, the baseline model shows that in countries with more potentially stranded fossil fuel assets, plants have significantly higher emission levels compared to plants whose countries have fewer assets at risk. Specifically, a 1% change (measured in millions of euros) of potentially stranded assets results in a .050% change in emissions, holding constant all other variables in the model. This finding is consistent with our first prediction that stranded assets increase plants’ emissions by fostering a more lenient regulatory climate.

In models 2 through 5, we examine whether changes in coal, oil, and gas prices influence plants’ emissions and can explain the effect of stranded assets observed in model 1. Findings indicate that none of the price variables has a significant effect on emissions regardless of whether they are added individually (models 2, 3, and 4) or as a group (model 5) to the equation. Their inclusion, therefore, has a negligible effect on the stranded assets effect across all four specifications. These results contradict the conventional green paradox thesis that fossil fuel suppliers will induce more emissions in the short run by lowering the price of coal, oil, and gas inputs. Instead, they comport with Di Maria et al.’s argument that plants’ long-term future contracts with fossil fuel suppliers often prevent them from responding to spot market changes in coal, oil, and gas.

To determine whether contractually constrained plants might still burn fossil fuels faster in countries where more carbon reserves are financially at risk, we interact our measures of stranded assets and change in plant capacity utilization rate in model 6. Results indicate there is a statistically significant interaction between these two factors. This is in keeping with our second prediction that when located in countries with more at-risk assets, plants have a stronger incentive to speed up the processing of the fuels they have already purchased and thus increase their CO2 emissions in the short term. Figure 2 shows the predicted effect of changes in plants’ utilization rate on their CO2 emission levels at a mean level of (logged) stranded assets (9.1), at 1 standard deviation below the mean (5.5), and at 1 standard deviation above the mean (12.8). Here we see that where more fossil fuel reserves are in jeopardy, plants utilize a larger percentage of their capacity over time, causing their emissions to rise. (Supplementary Table 1, which shows the determinants of plants’ CO2 emission levels under a 2 °C climate stabilization scenario that would regularly expose close to three times as many people to extreme heat, reports results nearly identical to those shown in Table 1).

Fig. 2: How the predicted effect of change in plant capacity utilization rate on power plants’ CO2 emission levels varies depending on total stranded assets.

figure 2

Reports the predicted effect of changes in plants’ capacity utilization rate on their (logged) CO2 emission levels at a mean level of (logged) stranded assets (9.1), at 1 standard deviation below the mean (5.5), and at 1 standard deviation above the mean (12.8).

Full size image

In Table 3, we assess the robustness of the association between our dependent and key independent variables. Models 1 and 2 are estimated for only plants that officially report their emissions, and the latter model includes the interaction between stranded assets and change in plant capacity utilization rate. In Model 3, we operationalize total stranded assets using an inverse hyperbolic sine function. The results of these three models are nearly identical to those reported in models 5 and 6 in Table 2. In models 4, 5, and 6, we examine whether plants emit more carbon because particular types of fossil fuels are at risk. Findings reveal that unburnable coal, gas, and oil are each significantly related to plants’ CO2 emission levels, providing further proof that the effects of our key independent variable – total stranded assets – are robust.

Table 3 Robustness checks of the association between the dependent and key independent variables

Full size table

Relative magnitude of the stranded assets effect

Having determined that stranded assets have a statistically significant effect on plants’ CO2 emission levels, we now consider the relative magnitude of that effect. In Table 4, we compare the total annual tonnes of carbon released by (the world’s or a nation’s) plants solely in response to at-risk assets to the remaining annual carbon budgets31 of the world’s and individual nations’ electricity sectors (see Methods). The first two columns of Table 4 reveal that for the world as a whole, the increase in annual CO2 emissions triggered by potentially stranded assets is 12.08 million metric tonnes per year or 0.21% of the electricity sector’s annual carbon budget when the chance of limiting global warming to 1.5 °C above pre-industrial levels is set to 50%. The third column shows that when the world’s annual budget is constrained further to have a 66% chance of staying below 1.5 °C, the relative magnitude of plants’ emissions is 0.28%.

Table 4 Magnitude of extra annual electricity-based CO2 emissions associated with stranded assets under a 1.5 °C scenario

Full size table

The first three columns of Table 4 also report the same estimates for the five countries with the most absolute CO2 emissions. Here we see, for instance, that the additional annual emissions associated with at-risk assets in China (3.09 million metric tonnes) are 0.19% to 0.26% of the budget for this country’s electricity sector. The extra emissions triggered by at-risk assets amount to even smaller percentages for India (0.02% to 0.04%) and Japan (0.0010% to 0.0013%). The relative magnitudes of plants’ extra emissions in the United States and Russia are higher, ranging, respectively, from 1.12% to 1.61% and .84% to 1.19%.

Although these findings might suggest that the percentage of carbon budgets used up by plants due to potentially stranded assets is modest, when one adds up these percentages over time, a more concerning picture emerges. As the last column reveals, during a period when the carbon budget will almost surely be breached and, therefore, every fractional “expenditure” of that budget matters32, the extra emissions associated with stranded assets could amount to between 2.1% to 2.8% of the world’s carbon allowance over a ten-year period. In the United States and Russia, the situation is even more troubling. These countries could exhaust 11.2% to 16.1% and 8.4% to 12%, respectively, of their electricity sectors’ carbon budgets due just to the stranded assets effect. This suggests that the financial pressures to “use it or lose it” are especially great among these two key incumbents of the carbon regime. In fact, the United States and Russia stand to lose the most profits from the physical stranding of assets12 and their power plants are older, on average, (30.3 and 30.6 years, respectively) than those in other countries (25.5 years).

Discussion

Past research on the green paradox has emphasized reactions on the supply side, whereby fossil fuel companies accelerate the extraction of carbon reserves, leading to a reduction in current fossil fuel prices and, in turn, an increase in CO2 emissions. While there is ample evidence that suppliers extract more fossil fuels and sell them at cheaper prices in anticipation of stronger environmental policies, there is less support for the idea that price decreases result in more CO2 emissions, which has cast doubt on the green paradox thesis. In contrast, our study redirects attention to the demand side, positing that regulatory leniency and power plants’ vested interest in their long-term fossil fuel contracts make plants more willing to burn fossil fuels earlier and thus are the mechanisms that produce the green paradox. In keeping with our argument that at-risk fossil fuel assets give government actors a financial incentive to relax environmental standards, results show that plants emit more carbon pollution in countries where vast amounts of fossil fuel reserves would be stranded under the Paris Agreement. And in keeping with our other argument that at-risk reserves motivate contractually constrained plants to speed up the processing and burning of their purchased inputs, findings indicate that stranded assets and plants’ capacity utilization rates positively interact, causing plants to further increase their emissions. While the extra amount of carbon released each year due to the stranded asset effect is moderate, its cumulative impact on the electricity sector’s remaining carbon budget could be significant in certain key countries. In addition to encouraging more theory building on the green paradox, therefore, our study’s findings suggest that if important policy-making communities are to develop effective transition strategies, they, too, must pay greater attention to the demand side of fossil fuel consumption.

An important topic for future research is whether the effect of stranded fossil fuel assets on plants’ emissions is strengthening over time33. The volume of emissions from the effect could dwindle as the fossil fuel sector shrinks. Or it could grow if more fossil fuel reserves are discovered through new production technologies. Additional research is also needed on the mechanisms we have theorized linking the key independent variable to the dependent variable. Although stranded assets’ direct and interactive effects on power plants’ CO2 emissions can be plausibly explained by countries’ regulatory leniency and plants’ vested interest in their long-term fossil fuel contracts, measures of these concepts are needed to determine to what extent they, as variables, mediate the observed effects of stranded assets in a causal chain of relationships34.

#### Extinction.

Dr. Yew-Kwang **Ng 19** [Winsemius Professor of Economics at Nanyang Technological University, Fellow of the Academy of Social Sciences in Australia and Member of Advisory Board at the Global Priorities Institute at Oxford University, PhD in Economics from Sydney University, “Keynote: Global Extinction and Animal Welfare: Two Priorities for Effective Altruism”, Global Policy, Volume 10, Number 2, May 2019, pp. 258–266, https://onlinelibrary.wiley.com/doi/10.1111/1758-5899.12647] Accessed 10/09/2024, DSL

Catastrophic **climate change** Though by no means certain, CCC causing **global extinction** is **possible** due to **interrelated factors** of **non-linearity**, **cascading effects**, **positive feedbacks**, **multiplicative factors**, **critical thresholds** and **tipping points** (e.g. Barnosky and Hadly, 2016; Belaia et al., 2017; Buldyrev et al., 2010; Grainger, 2017; Hansen and Sato, 2012; IPCC 2014; Kareiva and Carranza, 2018; Osmond and Klausmeier, 2017; Rothman, 2017; Schuur et al., 2015; Sims and Finnoff, 2016; Van Aalst, 2006).7 A possibly **imminent** tipping point could be in the form of ‘an **abrupt ice sheet collapse** [that] could cause a **rapid sea level rise’** (Baum et al., 2011, p. 399). There are **many avenues** for **positive feedback** in global warming, including: • the replacement of an **ice sea** by a **liquid ocean surface** from **melting** reduces the **reflection** and increases the **absorption of sunlight**, leading to faster warming; • the **drying of forests** from warming increases **forest fires** and the release of more **carbon**; and • higher **ocean** **temperatures** may lead to the **release of methane** trapped under the ocean floor, producing **runaway** global warming. Though there are also avenues for **negative** feedback, the **scientific consensus** is for an **overall net positive feedback** (Roe and Baker, 2007). Thus, the Global Challenges Foundation (2017, p. 25) concludes, ‘The world is currently **completely unprepared** to envisage, and even less **deal with**, the consequences of **CCC’**. The threat of sea-level rising from global warming is well known, but there are also other likely and more imminent threats to the survivability of mankind and other living things. For example, Sherwood and Huber (2010) emphasize the **adaptability limit** to climate change due to **heat stress** from high environmental wet-bulb temperature. They show that ‘even **modest** global **warming** could ... expose large fractions of the [world] population to **unprecedented heat stress’** p. 9552 and that with substantial global warming, ‘the area of land rendered **uninhabitable by heat stress** would **dwarf** that affected by rising **sea level’** p. 9555, making **extinction much more likely** and the relatively moderate damages estimated by most integrated assessment models unreliably low. While **imminent** extinction is very unlikely and may not come for a long time even under business as usual, the main point is that we **cannot rule it out**. Annan and Hargreaves (2011, pp. 434–435) may be right that there is ‘an upper 95 per cent probability limit for S [temperature increase] ... to lie close to 4°C, and certainly well below 6°C’. However, probabilities of 5 per cent, 0.5 per cent, 0.05 per cent or even 0.005 per cent of excessive warming and the resulting extinction probabilities cannot be ruled out and are unacceptable. Even if there is only a **1 per cent probability** that there is a time **bomb in the** air**plane**, you **probably want to change your flight**. **Extinction of the whole world is more important to avoid by literally a trillion times**.

## 1NC---Prolif

#### Contention two is prolif.

#### Trump’s actions with Ukraine put us on the brink of nuclear prolif – even one country pursuing nukes cascades globally.

Patrick Tucker, 3-9-2025, "Experts fear cascade of nuclear proliferation as Trump shakes alliances", Defense One, <https://www.defenseone.com/threats/2025/03/experts-fear-cascade-nuclear-proliferation-trump-shakes-alliances/403633/> [Patrick Tucker is science and technology editor for Defense One. He’s also the author of The Naked Future: What Happens in a World That Anticipates Your Every Move? (Current, 2014). Previously, Tucker was deputy editor for The Futurist for nine years. Tucker has written about emerging technology in Slate, The Sun, MIT Technology Review, Wilson Quarterly, The American Legion Magazine, BBC News Magazine, Utne Reader, and elsewhere.] DOA: 3/11/2025 \*brackets in original\* //RRM

U.S. allies around the world are warming to the idea of developing their own nuclear weapons, the result of a growing sense that U.S. President Donald Trump may abandon key international security commitments and alliances, former senior defense and White House officials told Defense One. Decades of nonproliferation efforts to persuade countries to forgo nuclear weapons, work led by the United States through security guarantees, are on the verge of collapse, the officials said. Should one or two nations launch nuclear projects, others will quickly follow. That could provoke a military response from Russia or China, which might touch off yet more nuclear development in a self-reinforcing, destabilizing cycle. What’s changed in the last two weeks? “The Trump administration's approach to Ukraine and Russia has significantly undercut allied confidence in the United States, including on extended [nuclear] deterrence,” Eric Brewer, a former director for counterproliferation at the National Security Council. “Not only is [Trump] pivoting away from allies but he's seemingly pivoting toward Russia.” The shift has shaken U.S. allies. France—the only NATO member with a nuclear arsenal that doesn’t depend on U.S. technology—hastened to shore up European deterrence by proposing to extend its nuclear “umbrella” to other countries. "I have decided to open the strategic debate on the protection of our European continental allies through our deterrence,” French President Emmanuel Macron said last week. Leaders from Berlin to the Baltics quickly praised the idea. German Chancellor-in-waiting Friedrich Merz on Sunday said, “We should talk with both countries [France and Britain], always also from the perspective of supplementing the American nuclear shield, which we of course want to see maintained.” But the French proposal leaves many questions unanswered. If France is to convince other nations to huddle under its nuclear umbrella, said one former senior White House senior official who worked on nuclear issues, Paris will need to launch a diplomatic campaign and be willing to share a great deal more information, including classified information, about nuclear decision-making and capabilities—much as the United States did in the 1960s. In the past, similar proposals have led NATO allies to begin talks, but they collapsed over issues such as who would control the weapons, a former senior defense official said. “There's just a lot of questions here about what the French are offering, whether they may really be willing to provide a dual key with Germany for weapons if they put them on German territory for instance. I suspect not,” they said. Indeed, soon after his initial announcement, Macron clarified that France would not share its warheads with other countries. Uncertainty France’s nuclear arsenal of about 290 warheads is larger than Britain’s (under 225) but far smaller than Russia’s (nearly 6,000). Neither has Russia’s diversity of warhead sizes and delivery systems. The U.K.'s small and expensive nuclear submarine fleet is undergoing modernization. France has air-launched cruise missiles. Russia has land-based mobile launchers, siloed ICBMs, bombers, and submarines. There’s a reason Europe made no attempt to keep up with Russia’s weapons development. Western Europe has always relied on the vast U.S. arsenal to deter Russia. But, the former senior defense official explained, France had a different deterrence strategy: hold just one or two major targets, like Moscow or St. Petersburg, in jeopardy. The U.S. idea “was that we were going to develop counter-force capability”—that is, weapons to disable or destroy an enemy’s nuclear capability—“try and take out Soviet weapon systems, command and control, leadership; and try and not go after cities if we could avoid it. The French have never had that kind of compunction. The basis of their strategy was ‘tear an arm off the bear.’ They never thought they could really take on the entire Soviet nuclear force.” In other words, Paris and London can’t destroy Russia’s ability to wage nuclear war—even enough of it to prevent the obliteration of both countries and more of Europe as well. That isn’t particularly reassuring to European leaders who believe that their countries would be a secondary priority for France should Russia attack. That may be why Poland’s Prime Minister ​​Donald Tusk said Friday that his country must “reach for opportunities related to nuclear weapons”—perhaps hinting at launching its own development effort. Proliferation triggers But the real trigger for a new arms race may sit outside of Europe, the officials warned. All of the former officials we spoke to said that South Korea is the U.S. ally that is furthest along in pursuing a new nuclear weapons program. The country feels “the most pressure right now,” said the former senior White House official. That’s true across South Korea’s political elites, including “the opposition party that may win the next election.” Should Seoul start hunting for the fuel to build such a device, Tokyo would likely launch a program of its own, they said, since Japan and South Korea are not treaty allies but do have hundreds of years of conflict history. “I find it hard to believe you'd see a Japan-and-South Korea joint nuclear weapons development project,” said the former senior defense official. All the officials we spoke to agreed that if one nation starts a nuclear-weapon program, others will likely do so as well. “Proliferation will beget more proliferation,” said the former senior White House official. Trump’s recent talk of abandoning treaty allies is not the only change that may push other nations toward nuclearization. He has also hinted that he might withdraw U.S. troops from certain countries, such as Japan or European nations. This would remove a “tripwire” that helps deter foreign attack, the former senior defense official said, and would cause a host government to consider new ways to deter attack on its own.

#### Affirming would invest in the HALEU program – it underpins all nuclear energy tech.

Nuclear Engineering International, 2-27-2025, "Will nuclear rise under Trump?", Nuclear Engineering International, <https://www.neimagazine.com/analysis/will-nuclear-rise-under-trump/> [Published continuously since 1956, Nuclear Engineering International provides technical insight behind the news headlines for all aspects of civil nuclear power generation and its related supply chains. News, analysis and in-depth articles cover topics from frontend fuel cycle to power plant operations and decommissioning. In addition to technical subjects, we also examine market developments, economics, government policy and management issues. Nuclear Engineering International is a media partner for key conferences and exhibitions, allowing the opportunity for brand partnerships.] DOA: 3/11/2025 //RRM

ONE achievements during Trump’s term also included establishing the National Reactor Innovation Center, which provides a platform for private sector technology developers to assess the performance of their reactor concepts through testing and demonstration. The centre continues to be funded, receiving $20m in 2023 (which also saw $120m for Risk Reduction for Future Demonstrations, and $60m for the ARDP Demonstration Reactor). In 2017 the Trump administration also brought the Transient Reactor Test Facility (TREAT) at INL back online, after more than two decades in standby mode. TREAT allows scientists to examine fuel performance under simulated accident conditions. In 2017 the Trump administration brought the Transient Reactor Test Facility (TREAT) back on line at INL (Source: DOE) Trump’s first term saw ONE begin “looking into multiple options to provide small amounts of high assay low-enriched uranium (HALEU) for testing and demonstration of these technologies”. HALEU is not currently commercially available from US suppliers and the DOE is pursuing several pathways to secure a domestic supply, and the Energy Act of 2020 established the HALEU Availability Program to ensure access to HALEU and spur demand for private investment in HALEU production. That programme continued to be funded by the Biden-Harris Administration’s Investing in America agenda, which noted that gaps in supply could delay the deployment of advanced reactors in a timeframe that supports the nation’s net-zero emissions targets by 2050. Recently the DOE promised up to $16m through a new HALEU Transportation Package Funding Opportunity to “research, develop, and acquire Nuclear Regulatory Commission (NRC) licensing for HALEU transportation packages”. It said many advanced reactor designs require HALEU to achieve smaller designs, longer operating cycles, and increased efficiencies over current technologies, but there are limited licensed options to transport HALEU. Programmes like the development and siting of new types of small reactor that are US-designed and built would seem to sit happily in the new administration’s stated plans to boost domestic energy supplies (and potentially export SMRs to overseas customers). Initiatives like the HALEU Availability Program, to ensure the US can supply its own fuel, also seem to be on-message for Trump. Domestically, it suggests the US nuclear industry could see its star rise under the new administration, even as other low-carbon technologies such as offshore wind lose political support. Indeed, while nuclear progress and support probably has to take a different route than the provisions covering low-carbon generation introduced under the Biden administration, such as the Inflation Reduction Act (IRA), domestic nuclear is expected to receive continued support under thew new Trump presidency. The industry could also have support from the new administration on the international stage. The ONE named as its final achievement during Trump’s first term that it saw DOE launch the NICE Future initiative in 2018. This global effort led by the USA, Canada, and Japan aimed to “ensure nuclear energy receives appropriate representation in high-level discussions about clean energy”. The industry will hope to retain that backing in the coming years.

#### Investment erodes non-proliferation safeguards and other deterrents.

John Carlson, 9-12-2024, "HALEU: Potential Safeguards and Non-Proliferation Implications", Vienna Center for Disarmament and Non‑Proliferation, <https://vcdnp.org/haleu-potential-safeguards-and-non-proliferation-implications/> [Background John Carlson joined the VCDNP as a Non-Resident Senior Fellow in July 2019. He holds a number of other appointments, including: Member and Senior Associate Fellow with the Asia-Pacific Leadership Network on Nuclear Non-Proliferation and Disarmament, Member of the International Advisory Council of the International Luxembourg Forum, and Member of the International Verification Consultants Network at VERTIC. Mr. Carlson worked in the Australian Public Service from 1963 to 2010, principally on energy, nuclear and international relations issues, including 21 years as Director General of the Australian Safeguards and Non-Proliferation Office (1989-2010). Concurrent appointments included: Chairman of the IAEA Standing Advisory Group on Safeguards Implementation (SAGSI) from 2001 to 2006, Alternate Governor for Australia at the IAEA Board of Governors, Australian Sherpa to the Nuclear Security Summit in 2010, and founding Chair of the Asia-Pacific Safeguards Network. Mr. Carlson is a Fellow of the Institute of Nuclear Materials Management (INMM) and holds the national award of Member of the Order of Australia (AM). Education Mr. Carlson studied law at the University of Sydney and has post-graduate qualifications in jurisprudence and modern logic.] DOA: 3/11/2025 //RRM

* Nuclear latency = ability to create nukes
* US does not reprocess meaning it currently does not have capacity to proliferate – it stopped that in the 70s and instead guards waste until it can be disposed of
* HALEU is uranium enriched between 5-20%

For safeguards purposes, enriched uranium is categorised by enrichment level in two categories: LEU – less than 20 percent U-235; and highly enriched uranium (HEU) – 20 percent U-235 and above. Currently, typical LEU power reactor fuel is enriched up to 5 percent U-235. This is not a formal limit but is the result of practical and economic factors. HALEU’s higher enrichment level, compared with typical LEU, has a number of safeguards and non-proliferation implications. 1 Addressing these issues is not urgent, as the introduction of HALEU-fuelled power reactors is some years away and the likely numbers and locations of these reactors is not known. Also, technical characteristics of HALEU fuel and the costs involved are uncertain at this stage. Nonetheless, it is advisable to consider potential problems now so appropriate safeguards and institutional arrangements can be established in good time. 2. Safeguards and non-proliferation issues The potential challenges with HALEU related to safeguards and non-proliferation can be briefly outlined as follows: (1) Higher attractiveness for diversion. This relates primarily to the possible diversion of HALEU as feedstock for high enrichment. However, a recent paper has also raised the possibility that HALEU could be used directly for a nuclear explosive device.2 Whatever the practicability of this, the issue certainly highlights a major difference with HALEU compared with current LEU fuels. If HALEU is diverted for further enrichment to weapon-grade HEU (90 percent U-235 and higher), the enrichment effort required would be significantly less than using typical LEU. For example, to produce HEU at 90 percent enrichment using as feedstock HALEU at 19.75 percent enrichment would require little over 40 percent of the enrichment effort compared with using LEU at 5 percent enrichment (see section 3 following). 1. A good overview is Warren Stern et al, Implications for IAEA Safeguards of Widespread HALEU Use, Brookhaven National Laboratory, 2021, presentation to National Academies, https://www.nationalacademies.org/documents/embed/link/LF2255DA3DD1C41C0A42D3BEF0989 ACAECE3053A6A9B/file/D510EFD2C81FFF967900DB1152D2AB4D70DEBEFED05F?noSaveAs=1. 2. R. Scott Kemp et al, The weapons potential of high-assay low-enriched uranium, Science, 6 June 2024, https://www.science.org/doi/10.1126/science.ado8693. 2 (2) Economic incentive to reprocess. The higher residual enrichment of spent HALEU, compared with spent LEU, could change the economics of reprocessing. As shown in the Annex to this paper, preliminary analysis suggests reprocessing HALEU could be economically attractive. Whether this is in fact the case will depend on the cost of reprocessing, which in turn will depend on practical aspects, especially burnup levels (affecting the proportion of fission products in spent fuel) and whether the higher fissile content of spent HALEU fuel causes significant complications in reprocessing HALEU. If reprocessing HALEU is viable, this would raise the following considerations: (a) nuclear latency issues, if new reprocessing plants are established in states that do not currently reprocess (currently the only non-nuclear-weapon State with a commercial reprocessing facility is Japan); (b) diversion risk for HALEU recovered for re-enrichment and for separated plutonium (assuming plutonium separation from HALEU is undertaken – see section 4 below). Major factors affecting questions of risk include the type of fuel and the type of fuel cycle involved. For example, currently there is no practical technology for reprocessing TRISO fuel.3 Currently, therefore, TRISO fuel is seen as presenting low proliferation risk. If in-line recycling is used, the diversion risks are different to those for current reprocessing operations and output. Acquisition path analysis would have to be based on the specific design of the reactor and associated processes. 3. Enrichment The following is an approximate comparison of the enrichment effort needed to produce one safeguards significant quantity (SQ) of weapon-grade HEU using feedstock of natural uranium, LEU and HALEU. As defined by the International Atomic Energy Agency (IAEA) for safeguards purposes, an SQ is a quantity of HEU containing 25 kilograms U-235. For the following calculations, weapongrade is defined as 90 percent U-235 (one SQ of HEU at 90 percent enrichment is approximately 27.8 kilograms of total uranium). The metric for enrichment effort is the SWU – separative work unit. Calculation of enrichment effort depends on the assumptions made, including: • The ratio between feed material available and planned/acceptable tails assay (depleted output); • The number of enrichment stages required; • Enrichment levels – figures used here are 5 percent U-235 for LEU and 19.75 percent U-235 for HALEU. Based on these figures, to produce one SQ of weapon-grade HEU: • Starting with natural uranium requires an enrichment effort of 5,370 SWU.4 • Starting with LEU enriched at 5 percent U-235 requires 835 SWU, that is, around 16 percent of the effort required if starting with natural uranium. 5 3. TRISO is TRi-structural ISOtropic particle fuel. A TRISO particle is made up of a uranium, carbon and oxygen fuel kernel. 4. SWU rounded - based on feed of 6.1 tonnes natural U, tails assay 0.3%. 5. SWU rounded - based on feed of 815kg LEU at 5%, tails assay 2.0%. 3 • Starting with HALEU enriched at 19.75 percent requires 345 SWU, that is, around 42 percent of the effort required if starting with LEU, or just over 6 percent of the effort required if starting with natural U.6 The practical effect of a reduced requirement for enrichment effort is less installed capacity required, less time required, or both. It can be argued that the difference between using LEU and HALEU as enrichment feedstock is marginal compared with using natural uranium feed. While this is correct, a difference of almost 60 percent less effort required for enriching HALEU compared with LEU is significant and cannot be ignored. Current IAEA routine inspection plans for enrichment plants, and for LEU holdings, reflect a context in which LEU is enriched up to around 5 percent U-235. This gives certain calculated quantities for LEU that a state planning clandestine enrichment could seek to divert, and the scale of enrichment operations the state would need for this purpose. For states producing HALEU, or holding stocks of HALEU, the IAEA will need to take into account that the quantities of possible diversion significance are much smaller compared with LEU (or looked at another way, the potential breakout time will be much shorter). An issue for consideration is whether a new material category for HALEU, between LEU and HEU, is warranted. 4. Reprocessing and use of reprocessed uranium If HALEU enters into widespread use, it could change the currently unfavourable economics of reprocessing. This is because HALEU spent fuel will contain much higher levels of U-235 compared with spent LEU fuel, potentially making the uranium (which, depending on burnup, will comprise some 80 percent or more of the spent fuel) commercially attractive to recover. Unless there is a substantial increase in HALEU enrichment capacity (resulting in lower enrichment costs), reprocessing HALEU could be of interest both because it may be cost effective and because, as discussed below, it could help to meet HALEU demand. The cost of reprocessing. In considering the economics of reprocessing, the key metric is cost. Reprocessing costs are difficult to ascertain from readily available information, whether for current operations or for possible future reprocessing of HALEU fuels. Costs are affected by factors such as whether a reprocessing plant already exists or is yet to be built, the technology used, the scale (level of throughput) and so on. Depending on a number of variables, such as residual enrichment and burnup levels, spent HALEU fuel could have a fissile content (comprising residual U-235 plus produced plutonium) in the range of 7-10 percent, compared with typical spent LEU fuel at around two percent (comprising residual U-235 plus produced plutonium). This raises the question of whether criticality could present practical issues for reprocessing HALEU fuel. A higher fissile content could require a specially designed facility – the cost implications are not known. For the purpose of this paper it is assumed reprocessing costs for HALEU per unit of heavy metal will not be substantially different to those for LEU, but this assumption might prove to be optimistic. Another factor affecting reprocessing costs is the proportion of actinides and fission products in spent fuel. This is affected by the burnup level. In current light water reactor spent fuel the proportion of actinides and fission products is typically around 4 percent. As shown in the Annex to this paper, depending on the burnup level, the proportion of actinides and fission products in HALEU fuel could be as high as 24 percent, or possibly more. This would have a major effect on reprocessing economics. 6. SWU rounded - based on feed of 138kg HALEU at 19.75%, tails assay 2.0%. 4 In writing a 2016 paper on reprocessing the author found sources suggesting a range of reprocessing costs from $903 to $5,400 per kilogram of heavy metal (kg HM).7 The author settled on $2,500/kg HM as a reasonable indicative figure for the purpose of analysis. Applying inflation to the $2,500 figure suggests today’s equivalent would be around $3,200/kg HM. This is consistent with data in a 2019 French report which, after conversion from euros to US dollars and adjusted for inflation, indicates a similar figure. 8 Accordingly, for the purposes of this paper the figure of $3,200/kg HM is used. Reprocessing typical LEU fuel. The LEU fuel used today typically has an enrichment level of up to five percent U-235.In spent fuel the residual enrichment is less than one percent U-235 (say, 0.9 percent), which is little more than natural uranium. Applying the figure of $3,200/kg HM to reprocessing typical LEU fuel, the cost per kilogram of recovered product (uranium and plutonium), taking into account the actinide/fission product content (about four percent), is around $3,330 ($3,200 x 1.04). The value of the uranium is only a fraction of the cost of recovery. Each kilogram of this slightly enriched uranium costs $3,330 to recover, but the value in terms of its enrichment level is only around $435/kg.9 To reprocess 100 kilograms of spent fuel will cost $320,000; the value of the recovered uranium (94 kg x $435) will be about $40,000. Taking into account the value of the recovered uranium, the one kilogram of plutonium recovered from 100 kilograms of spent fuel effectively costs $280,000. These figures illustrate why reprocessing is totally uneconomic today. Reprocessing HALEU fuel. Compared with the current adverse economics of reprocessing, the major change with HALEU is that the value of the uranium, which will comprise 80 percent or more of the spent fuel, might make the uranium cost-effective to recover. Whether this is the case will depend, inter alia, on the initial enrichment level and the burnup level, which in turn will affect the residual enrichment level and the proportion of actinides and fission products. A number of scenarios are outlined in the Annex. If the residual enrichment level is around seven percent U-235, the recovered uranium (reprocessed uranium – RepU) could be recycled as standard LEU fuel without requiring re-enrichment, either directly or, if the residual enrichment is high enough, after down-blending to standard LEU levels (see parts 4 and 5 of the Annex). RepU could also be used as feedstock for re-enrichment to HALEU. This could be cost-effective if the residual enrichment level of the RepU is high enough (say over seven percent U-235), even taking into account the costs of compensating for the U-236 content. The presence of U-236 produced during irradiation is a complication in using RepU. This imposes additional costs in recycling uranium. Uranium-236 is not fissile, so it is undesirable in fuel for thermal reactors, and it cannot be efficiently separated by centrifuge enrichment because the mass difference between U-235 and U-236 is too small. If RepU is re-enriched, U-236 will be split between the enriched and depleted streams, and additional separation effort (SWU) will be needed to reach the required U-235 level. Also, U-236 in enrichment feed will contaminate centrifuges and piping, possibly causing subsequently enriched (nonreprocessed) LEU or HALEU product to be off specification. Consequently, enrichment operators will want to limit enrichment of RepU to dedicated cascades – and are likely to seek an increased SWU price to compensate for this.10 7. John Carlson, The Case for a Pause in Reprocessing in East Asia: Economic Aspects, NTI, August 2016, https://www.nti.org/analysis/articles/case-pause-reprocessing-east-asiaeconomic-aspects/. 8. Cour des comptes, Downstream Nuclear Fuel Cycle, 2019, https://www.ccomptes.fr/sites/default/files/2023-10/20190704-rapport-aval-cycle-combustiblenucleaire.pdf. 9. The figure of $435/kg is calculated on the basis of enriching natural uranium to 0.9 percent enrichment, taking account of costs for natural uranium feed, conversion and SWU. 10. Note however that if laser enrichment is commercially established, a laser process may be able to separate U-236 from RepU. 5 Another issue with using RepU, particularly for enrichment, is the presence of U-232, a decay product derived from neptunium-237 (via plutonium-236). Uranium-232 daughter products are strong gamma emitters, so precautions will be required to limit radiation exposure of personnel. This would add to costs. The greatest challenge associated with reprocessing HALEU appears to be the actinide/fission product content, which is expected to be much higher than with current LEU fuels due to higher burnup. This would have a marked impact on reprocessing cost. If the actinide/fission product content is say 24 percent, then effectively the cost per kilogram for recovered product (uranium and plutonium) will be $3,200 x 1.31, that is, around $4,200/kg. The calculations in the Annex suggest this figure could still be economic in some scenarios, though this is far from certain. Issues to consider with reprocessing HALEU include: (1) Should the plutonium in the spent fuel be separated or left as a uranium-plutonium mix? Plutonium could be separated in reprocessing and used to produce MOX (mixed uranium and plutonium oxides) fuel, as done in current reprocessing programmes. Another possibility would be to leave the plutonium in the product stream, which would then comprise a uranium-plutonium mix.11 Depending on the enrichment level of the uranium, retention of the plutonium could help to overcome the disadvantage of having a U-236 content. Depending on burnup, the plutonium content in spent HALEU fuel could be around two percent. This plutonium is likely to comprise around 60 percent fissile isotopes, so retaining the plutonium in the recovered uranium product would effectively be equivalent to an additional one percent enrichment. (2) What to do about the U-236 content in reprocessed uranium? This could be addressed in two ways: (a) One approach is to reprocess HALEU that has a sufficiently high residual enrichment level to compensate for the contained U-236. For example, if the residual enrichment is seven percent U-235, and the U-236 content is two percent, the effective enrichment level will be around five percent. 12 As noted in the Annex (part 4), a potential policy issue raised by compensating for U-236 in the enrichment of RepU is that if an effective enrichment level at the top of the HALEU range (say 19.75 percent) is sought, this would require enriching to slightly above 20 percent U-235. This would cross the threshold of the HEU category. The implications of this require further study. (b) An alternative approach is blending the RepU with fresh (i.e. non-irradiated) LEU to dilute the U-236 content. The proportions would depend on the enrichment level and U-236 content of the RepU, but something in the order of four-to-one (four parts of fresh LEU to one part of RepU) could reduce the U-236 to an acceptable level. Here too retention of plutonium in the mix would increase the fissile content of the blend. 11. An example is the Russian REMIX fuel concept, where plutonium remains with the RepU product and the fissile content of the mix is adjusted through blending with unirradiated enriched uranium. 12. Also, as noted above, retention of plutonium with the uranium would have a similar effect to an additional one percent enrichment. So a residual enrichment of six percent, together with the plutonium, would have a combined fissile content of seven percent, allowing for a U-236 content of two percent. This would correspond to an effective enrichment level of 5 percent. 6 5. Conclusions An increase in the number of states producing HALEU, holding HALEU stocks and fabricating HALEU fuel, and an increase in movements of HALEU, all have implications for safeguards. This could require adjustments in the frequency and intensity of safeguards inspections, and could also lead to the conclusion that safeguards should be supplemented by additional technical measures13 and institutional measures (such as control and ownership arrangements) to reduce proliferation risk. It is possible that reprocessing HALEU could be attractive both on cost grounds and to help meet increasing HALEU demand. The likelihood of this is difficult to assess at this stage. Deployment of SMRs and advanced reactors in significant numbers is still years away – meanwhile enrichment capability may expand, leading to lower enrichment prices, so the incentive to reprocess may diminish. Currently it is difficult to find the real costs of current reprocessing operations, there are subsidies and hidden costs. There is no common standard for “economic” operations – states are prepared to absorb costs in the interest of research and development. It is notable that some states have proceeded with current reprocessing operations despite the adverse economics. A concern is whether some states may be prepared to overstate the economic case for reprocessing in order to justify establishing a dual-use fuel cycle capability. Governments and the IAEA need to start considering how best to deal with this situation – the possibility of new reprocessing projects is problematic, even if the plutonium is not recovered as a separate product. Some reactor designs and fuel concepts would enable recycling without current forms of reprocessing, but any spread of capabilities that could assist clandestine separation needs to be dealt with very cautiously. Accordingly, the safeguards and non-proliferation implications of HALEU should be assessed in the near term so an appropriate control regime, if required, can be established in time to be effective. An important part of future fuel cycle arrangements is likely to be suppliers taking responsibility for dealing with spent HALEU fuel. To address the various concerns touched on here, it may be time to develop a multilateral approach to proliferation-sensitive aspects of the fuel cycle.

#### Tech gets exported globally.

Edwin Lymann, 03-18-2021, "Advanced" Isn't Always Better, Union of Concerned Scientists, <https://www.ucs.org/resources/advanced-isnt-always-better> [Before joining UCS, Dr. Lyman was president of the Nuclear Control Institute, a Washington, D.C.-based organization focused on nuclear proliferation. From 1992 to 1995, he was a postdoctoral research associate at Princeton University’s Center for Energy and Environmental Studies (now the Science and Global Security Program). He earned a doctorate degree in physics from Cornell University in 1992. Edwin Lyman is an internationally recognized expert on nuclear proliferation and nuclear terrorism as well as nuclear power safety and security. He is a member of the Institute of Nuclear Materials Management, and has testified numerous times before Congress and the Nuclear Regulatory Commission.] DOA: 3/12/2025 //RRM

One characteristic that UCS did not consider here is the ability of reactors to provide high-temperature process heat for industrial applications—sometimes cited as a major advantage of NLWRs. However, potential industrial users have demonstrated little interest in these applications to date, and will likely continue to be wary of co-locating nuclear power plants at their facilities until outstanding safety, security, and reliability issues are fully addressed. It is also doubtful that industrial users would want to assume the cost and responsibility of managing the reactors’ nuclear wastes. Consequently, UCS regards the generation of high-temperature process heat as a secondary objective that would first require significant improvements in nuclear safety and security.3 Safety and security risk is the vulnerability of reactors and fuel cycle facilities to severe accidents or terrorist attacks that result in significant releases of radioactivity to the environment. Routine radioactive emissions are also a consideration for some designs. The UCS assessment primarily used qualitative judgments to compare the safety of reactor types, because quantitative safety studies for NLWRs with the same degree of accuracy and rigor as for LWRs are not yet available. Far fewer data are available to validate safety studies of NLWRs than of LWRs, which have accumulated a vast amount of operating experience. Sustainability, in this context, refers to the amount of nuclear waste generated by reactors and fuel facilities that requires secure, long-term disposal, as well as to the efficiency of using natural (mined) uranium and thorium. Sustainability criteria can be quantified but typically have large uncertainties. To account for those uncertainties, this report considers that sustainability parameters, such as the amount of heat-bearing transuranic (TRU) elements requiring long-term geologic disposal, would have to improve by a factor of 10 or more to be significant. Nuclear proliferation and nuclear terrorism risk is the danger that nations or terrorist groups could illicitly obtain nuclear-weapon-usable materials from reactors or fuel cycle facilities. LWRs operating on a once-through fuel cycle present relatively low proliferation and terrorism risks. However, any nuclear fuel cycle that utilizes reprocessing and recycling of spent fuel poses significantly greater nuclear proliferation and terrorism risks than do LWRs without reprocessing, because it provides far greater opportunities for diversion or theft of plutonium and other nuclear-weaponusable materials. International safeguards and security measures for reactors and fuel cycles with reprocessing are costly and cumbersome, and they cannot fully compensate for the increased vulnerability resulting from separating weapon-usable materials. Also using HALEU instead of less-enriched forms of LEU would increase proliferation and terrorism risks, although to a far lesser extent than using plutonium or uranium-233. Nuclear proliferation is not a risk in the United States simply because it already possesses nuclear weapons and is designated as a nuclear-weapon state under the Nuclear Non-Proliferation Treaty. As such, it is not obligated to submit its nuclear facilities and materials for verification by the International Atomic Energy Agency (IAEA), although it can do so voluntarily. However, US reactor development does have implications for proliferation, both because US vendors seek to export new reactors to other countries and because other countries are likely to emulate the US program. The United States has the responsibility to set a good international example by ensuring its own nuclear enterprise meets the highest nonproliferation standards.4 Not all these criteria are of equal weight. UCS maintains that increasing safety and reducing the risk of proliferation and terrorism should take priority over increasing sustainability for new reactor development at the present time. 6 union of concerned scientists Given that uranium is now cheap and abundant, there is no urgent need to develop reactors that use less. Even so, there would be benefits from reducing the need for uranium mining, which is hazardous to workers and the environment and historically has had a severe impact on disadvantaged communities. Developing more efficient reactors may become more useful if the cost of mined uranium increases significantly, whether due to resource depletion or strengthened protections for occupational health and the environment. UCS also did not consider the potential for NLWRs to be more economical than LWRs. Although economics is a critical consideration and is interrelated with the criteria listed above, such an evaluation would depend on many open and highly uncertain issues, such as final design details, future regulatory requirements, and supply chain availability. Assessments of NLWR Types UCS has reviewed hundreds of documents in the available literature to assess the comparative risks and benefits of the three major categories of NLWR with respect to the three evaluation criteria (Table 2)

#### European prolif risks nuclear war – entanglement, miscalc, and arms races.

Dr Tytti Erästö, 12-5-2023, "More investment in nuclear deterrence will not make Europe safer", SIPRI, <https://www.sipri.org/commentary/essay/2023/more-investment-nuclear-deterrence-will-not-make-europe-safer> [Dr Tytti Erästö is a Senior Researcher in the SIPRI Weapons of Mass Destruction Programme, focusing on nuclear disarmament and non-proliferation issues. Her recent and current research focuses on the Iran nuclear deal, the Nuclear Non-Proliferation Treaty, the Treaty on the Prohibition of Nuclear Weapons, the U.S./NATO-Russia dispute over missile defence, international efforts at establishing a WMD free zone in the Middle East, as well as other issues related to nuclear arms control. Previously she has worked at the Ploughshares Fund in Washington D.C., Harvard Kennedy School’s Belfer Center for Science and International Affairs, the Vienna Center for Disarmament and Non-Proliferation, and the Tampere Peace Research Institute in Finland.] DOA: 3/23/2025 //RRM

In contrast to NATO’s conventional power and the USA’s strategic nuclear forces, the US non-strategic nuclear weapons under NATO nuclear sharing arrangements do not constitute a credible means of deterrence. Although the replacement of older DCA with F-35s increases the likelihood of penetrating the adversary’s air defences in the case of a NATO nuclear strike against Belarus or Russia, a decision to do so would require not only authorization by the US and UK heads of state but also consensus among the alliance’s Nuclear Planning Group. This would mean an unlikely agreement among a group of 30 European democracies to order the first use of nuclear weapons or to respond in kind to a nuclear strike, thus engaging in nuclear warfare. Even if the allies could reach such a decision, any effort by NATO to control escalation would be undermined by the vulnerability of allied air bases to Russian counterforce attacks. Russia has thousands of nuclear weapons that it could use to destroy these bases, even after successful NATO strikes on Russian territory. The expansion of the existing nuclear sharing model to include new countries therefore makes little sense as a means to strengthen deterrence. Apart from further fuelling tensions, a new nuclear weapon base in Poland would add one more location to the adversary’s list of targets during a potential nuclear war. Insofar as US nuclear weapons in Poland would contribute to deterrence, this would have little to do with the weapons themselves and would rather derive from the American boots on the ground that would come with the B-61 package. Addressing the survivability problem through dispersal Reflecting a partial recognition of the credibility problem described above, discussions are happening behind closed doors within NATO on ways to increase the survivability of non-strategic nuclear forces. The debate seems to be focused on a ‘dispersal’ strategy, whereby US non-strategic nuclear forces would be spread across a greater number of European locations during crises, thereby complicating counterforce targeting for the adversary. An IISS report from September this year also discusses the idea. As a more viable alternative to peacetime nuclear weapon deployments in Poland, it suggests that NATO could ‘designate several Polish airfields as potential Dispersed Operating Bases’ to provide ‘additional options for dispersing dual-capable aircraft in wartime and in near-war situations’. It further suggests that, even if Poland did not host B-61 bombs, the Polish F-35s could be certified to deliver such weapons, and that similar measures could be taken in other member states. Until now, only those US allies that host nuclear weapons have been authorized to operate DCA under NATO nuclear sharing arrangements. There are indications that some elements of a dispersal strategy are already being implemented in the UK, which maintains a national sea-based strategic nuclear deterrent but does not possess non-strategic nuclear weapons of its own. As reported by the Federation of American Scientists, US Air Force budgetary documents imply that, 15 years after the withdrawal of US non-strategic nuclear weapons from the UK, the nuclear weapon storage facility at RAF Lakenheath airbase is being upgraded. Noting denials by US officials of plans to redeploy US nuclear weapons on UK soil, the FAS report notes that the base could ‘potentially receive nuclear weapons in the future or in the midst of a crisis, without necessarily having already decided to permanently station them’. The report also points to construction projects at other hosting states’ nuclear weapon bases that are ‘designed to facilitate the rapid movement of weapons on- and off-base to increase operational flexibility’. Depending on the extent to which it is implemented, the dispersal strategy would indeed complicate targeting for the adversary by creating uncertainty about the location of NATO nuclear forces. However, in practice Russia can be expected to hedge against this uncertainty by expanding the list of European targets during a hypothetical nuclear war to also include potential rather than just known nuclear weapon facilities, thereby exposing a bigger portion of the European continent to the devastating effects of nuclear explosions. Moreover, dispersal does not remove the main factor undermining the credibility of NATO’s non-strategic nuclear threats, which is that a large group of European democracies can hardly be expected to take a unanimous decision to turn their continent into a theatre of nuclear war. Calls for new nuclear weapons in Europe In recent years, several commentators have argued for the reintroduction of land-based intermediate-range missiles to Europe. These sub-strategic weapons—with a range of 500–5500 kilometres and thus seen as halfway between non-strategic and strategic weapons—were banned by the 1987 Intermediate-Range Nuclear Forces (INF) Treaty, from which both Russia and the USA withdrew in 2019. Noting that the treaty only came about after NATO’s 1983 deployment of nuclear-armed intermediate-range missiles, which was a response to earlier Soviet SS-20 deployments, proponents argue that a similar move today could push Russia to the arms control table. However, this historical analogy hardly stands up to scrutiny. The INF Treaty was the result of several fortunate conditions that happened to align at the time. These included the personalities of the Soviet and US leaders, their shared ambition to pursue nuclear disarmament, and the perception of symmetry in intermediate-range capabilities, creating a mutual interest in their elimination. The prospects of recreating such circumstances today are slim. Instead, a more likely result of European intermediate-range missile deployments would be a reciprocal Russian response, which would further worsen regional arms race dynamics. Even if armed with conventional warheads, as some have proposed, intermediate-range missiles involve particular escalation risks due to the combination of their ability to strike deep into an adversary’s territory and the difficulty of distinguishing between nuclear and conventional warheads during a crisis. A more authoritative proposal for new nuclear weapons in Europe, the October report by the Congressional Commission on the Strategic Posture of the USA, recommends additional theatre nuclear capabilities in Europe that are ‘deployable, survivable, and variable in their available yield options’. Although the authors are not explicit about what weapon types they have in mind, recent US debates suggest that these could include land-based intermediate-range missiles and nuclear-armed sea-launched cruise missiles (SLCM-N). Unlike the dispersal strategy, which would not involve changes in peacetime nuclear weapon deployments and might therefore not provoke major public reaction, nuclear force build-up involving new nuclear weapons would be a hard sell in Europe. This is especially true if new land-based missiles were to be introduced to the continent. Deployment of SLCM-Ns on US attack submarines would be less visible and thus also less controversial among allied countries. It would nevertheless pose a challenge for US relations and military cooperation with those NATO members (such as Denmark and Norway) that do not allow the transit of nuclear weapons through their territory or visits by nuclear-armed vessels at their ports. As US critics point out, SLCM-Ns, if deployed, would also increase escalation risks and worsen arms race dynamics by triggering responses from US adversaries. Moreover, given that the US strategic arsenal already provides options for tactical nuclear weapon use, it is hard to see the added deterrence value of the proposed new theatre nuclear weapon deployments. The need for a long-term perspective on European security Despite NATO’s military superiority over Russia, a feeling of insecurity persists in Europe, which can make analysts and government officials receptive to proposals to increase reliance on nuclear weapons. In addition to Russia’s actions in Ukraine, this can partly be explained by the nature of conventional deterrence. While there is no doubt that nuclear threats, if carried out, would lead to unacceptable damage to the adversary, the effects of using conventional force are more difficult to predict. This is because the ability to wage a conventional war depends not only on military capabilities but also on other factors such as strategy, tactics and morale. Moreover, information on the existing conventional forces is scattered and not easily available, which complicates comparative assessments and arguably contributes to the tendency to underestimate NATO’s relative power compared to Russia. Another factor highlighting the sense of insecurity in Europe is that Russian nuclear threats have exposed Europe’s vulnerability to nuclear weapons for the first time since the end of cold war. US strategic signalling and plans to strengthen NATO’s non-strategic nuclear forces have reassured its European allies, but they have also contributed to the illusion that Europe’s vulnerability to Russian nuclear weapons could somehow be reduced by greater investment in nuclear deterrence. In reality, as suggested above, the strategy of dispersing nuclear weapons during crises would only make nuclear war in Europe more devastating, while deploying new nuclear weapons could make such a war more likely. Instead of a futile quest for absolute security, Europeans should recognize the strength of NATO’s existing conventional forces, which can temper worst-case assumptions about Russian aggression against NATO. The downside to the prevailing power imbalance in Europe’s favour is that Russia will likely continue its greater reliance on nuclear weapons while it rebuilds its conventional forces. There is, however, no military solution to this problem. Ultimately, threat perceptions on both sides need to be addressed through the creation of a more sustainable regional security order that not only ensures sovereignty for Ukraine and other countries that might fall victim to Russian aggression but also reduces Russia’s exaggerated threat perceptions of NATO. While this seems unachievable under the current Russian leadership, tensions could be managed in the short term by promoting stability at the NATO–Russian border. Norway’s longstanding self-imposed restrictions on allied overflights and military exercises in its northern territory near the Kola Peninsula provide one model that could be extended to NATO’s new Nordic members—notably Finland, whose more permissive policy on allied overflights may undermine the Norwegian restrictions.

#### Prolif collapses global governance.

Michael Moodie and Jerry Zhang, 10-31-2022, "Bolstering Arms Control in a Contested Geopolitical Environment • Stimson Center", Stimson Center, <https://www.stimson.org/2022/bolstering-arms-control-in-a-contested-geopolitical-environment/> [Mr. Moodie is currently an Associate Fellow of the Royal Institute of International Affairs (Chatham House) in London and Secretary of the Board of Trustees of the Wilton Park US Foundation. In academia, Mr. Moodie has had appointments as Visiting Professor at Georgetown University’s School of Foreign Service and George Mason University, and as an Instructor at Chestnut Hill College. Mr. Moodie was educated at Lawrence University in Appleton, Wisconsin and the Fletcher School of Law and Diplomacy, Tufts University. Jerry Zhang is a Master’s student at Georgetown University’s Walsh School of Foreign Service where he focuses on science, technology, and international affairs. He interned at the Stimson Center’s Global Governance, Justice and Security Program after graduating from Tufts University in 2021.] DOA: 4/2/2025 //RRM

The evolving global environment, then, is almost certain to be more contentious, perhaps dangerously so, with nations locked in heated rivalries over trade, technology, diplomatic influence, and competing national security interests, to say nothing of potential military confrontations. A military conflict between China and the U.S. over Taiwan, for example, is no longer an unthinkable scenario.25 This more adversarial geostrategic environment brings the world to the brink of a destabilizing arms race and complicates the prospect of multilateral cooperation on arms control. Coming under such severe pressure, global arms control will be challenged significantly to play its traditional role as a crucial contributor to global governance.

The need for global arms control

In this environment, arms control could become a crucial tool for promoting global security and stability. Successful cooperation in arms control is not only in the long-term economic and strategic interests of leading countries, but it can also serve to strengthen global governance. By contrast, the failure to reinvigorate arms control might only intensify competitive stresses with potential implications for the norms and institutions that are core components of the international system.

First, arms control can contribute to a more stable and predictable relationship between the great powers. While arms control will not halt U.S. strategic competition with Russia, China, or others, it could dampen its most dangerous aspects. Historically, U.S.-Soviet arms control arrangements, such as the Strategic Arms Limitation Talks (1969-1979) or the Intermediate-range Nuclear Force Treaty (1987), helped to foster détente and a modus vivendi in their relations. Arms control provided a mechanism for confidence-building and crisis-management by creating valuable personal and organizational relationships and helping officials better understand each other’s approaches. This was the case not only bilaterally but multilaterally through entities like the Conference (now Organization) for Security and Cooperation in Europe (C/OSCE). 26

Second, arms control can strengthen strategic stability by avoiding an intensifying arms race that locks rivals into an indefinite cycle of arms expansion and fosters greater insecurity with increased chances for miscalculation. Arms races, moreover, are expensive, absorbing immense financial, technological, and human resources. Keeping military expenditure under control is in the economic interests of every party, whether their economies have been hurt by the pandemic as in the U.S., or they have noticeably slowed in recent years as in China.27 One reason that arms control garners support among politicians and the public is that resources spent on an arms race could have been devoted to other efforts such as fighting climate change or helping post-pandemic reconstruction in the developing world.

Third, arms control can also mitigate the negative impacts of the proliferation of advanced weaponry. As emerging technologies become more accessible, the risk also grows that they will fall into the hands of terrorists, criminals, warlords, or other malign actors.28 In the conventional weapons sphere, drones, which used to be state-of-the-art, are now being used not just by military forces but by non-state actors in such places as Syria, Libya, and Yemen.29lethal autonomous weapons, could exacerbate competition and make conflicts more destructive.

Finally, arms control can diminish the risks of war through accident and miscalculation. The Cold War witnessed a number of close calls, be it the Cuban Missile Crisis or the war scare over the 1983 Able Archer exercise. Although the world has escaped the catastrophe of an unintended nuclear war thus far, in the future nothing is guaranteed. The advance in disruptive technology further increases such a risk: cyber-attacks might escalate into a nuclear exchange, and plausible scenarios can be conceived in which the possible exploitation of artificial intelligence in future chains of command plunges the world into a devastating war by error.30

#### Effective governance is a prerequisite to solving existential risks.

Henry Willis et al., 10-30-2024, "Understanding and Managing Global Catastrophic Risk", RAND, <https://www.rand.org/pubs/research_briefs/RBA2981-1.html> [Willis earned his Ph.D. in engineering and public policy at Carnegie Mellon University, M.S. in environmental engineering from the University of Cincinnati, and B.A. in chemistry from the University of Pennsylvania. Naranyan: Ph.D. in engineering and public policy, Carnegie Mellon University; B.S. in applied mathematics, University of Texas at Austin. Boudreaux holds a Ph.D. in philosophy from the University of California, Berkeley, a M.S. in foreign service from Georgetown University, and a B.A. in economics and philosophy from NYU. Geist received his Ph.D. in history from the University of North Carolina. Gerstein graduated from West Point and has a Ph.D. from George Mason University and master's degrees from Georgia Tech, National Defense University, and Army Command & General Staff College. Espinosa has a PhD in Chemistry from USC and is a Doctor of Philosophy. Goldfeld received her Ph.D. in chemical physics from Columbia University where she was an NSF graduate fellow. Kalra holds a Ph.D. in robotics from Carnegie Mellon University’s Robotics Institute. LaTourrette holds a Ph.D. in geology from the California Institute of Technology. Lathrop has a PhD in robotics from UCSD.] DOA: 4/2/2025 //RRM

Common Factors Affecting All Six Sources of¶ Global Catastrophic Risk¶ Several common factors influence global catastrophic risk¶ from all six threats and hazards assessed in the RAND report:¶ • the rate and nature of technological change¶ • the maturity of global governance and coordination¶ • failure to advance human development¶ • interactions among the hazards themselves.¶ How these drivers evolve can determine how, how¶ seriously, and how swiftly the United States and countries¶ worldwide will need to respond to manage the risks. Plans¶ that reflect these drivers will be more robust to the uncertainties they create.¶ Figure 3 Quality of Evidence Supporting Risk Management and the Geographic Extent of¶ Global Catastrophic and Existential Risks¶ Geographic extent of consequences¶ Quality of evidence to support risk management¶ Intentional pandemics,¶ including those enhanced¶ with synthetic biology¶ Unaligned¶ arti­cial general¶ intelligence¶ Exceedance of¶ thresholds for key¶ global climate¶ risks¶ Global¶ nuclear war¶ Comets¶ Global¶ atmospheric effects of¶ a supervolcano¶ Natural pandemics¶ Caldera eruption¶ (local effects) Small asteroids¶ Climate change–enhanced¶ natural hazards¶ Medium-sized asteroids¶ AI’s effects on existing risks¶ Large asteroids¶ Regionalized Global¶ High¶ NOTE: The placement and sizes of the ovals in this figure represent a qualitative depiction of the relative relationships¶ among threats and hazards based on interpretation of aspects of the assessments described in the report. The figure¶ presents only examples of some cases and scenarios described. Artificial general intelligence generally refers to AI¶ systems that can do at least as well as humans can on cognitive tasks, handle unanticipated problems, and generalize¶ what they learn. A caldera is a large crater caused by certain kinds of volcanic eruptions. For more about these¶ concepts, see the main report.¶ Low¶ 8¶ Managing Global Catastrophic Risk¶ Aligning Risk Management to the Nature¶ of Specific Hazards¶ As noted above, the hazards and threats reviewed by¶ RAND can vary widely in terms of the geographic extent¶ over which consequences can be expected to occur and the¶ quality of understanding about their scope, likelihood, and¶ consequences. These two dimensions of risk, which are¶ plotted in Figure 3, influence the appropriateness of risk¶ management approaches.¶ For the threats and hazards with relatively wellunderstood effects and responses and where the geographic¶ scale of the consequences aligns with the appropriate risk¶ management jurisdictions (i.e., those in the lower left-hand¶ corner of Figure 3), FEMA, DHS more generally, and other¶ parts of the U.S. government could begin to organize useful¶ responses. For example, for small asteroids, the government could improve the National Aeronautics and Space¶ Administration’s (NASA’s) planetary defense capabilities¶ and improve capabilities for evacuation and civil defense.¶ Such evacuation and civil defense capabilities would also¶ Figure 4 Risk Management Intervention Opportunities¶ PREVENTING IMPACT REDUCING THE CONSEQUENCES¶ OF IMPACT¶ Reduce¶ severity of¶ effects¶ Enhance¶ response¶ and recovery¶ Reduce the¶ onset of the¶ threat or¶ hazard¶ Disrupt¶ mechanism¶ leading to¶ risk¶ 9¶ prove useful for the local effects of a supervolcano and for a¶ limited nuclear attack. Other events of this scale and relative¶ understanding can leverage existing planning frameworks,¶ such as the National Preparedness System and conventional¶ approaches to planning for continuity of government and¶ continuity of operations.¶ Addressing the risks in the other corners of Figure 3,¶ however, will require significant innovation to generate (1) the¶ capacity for currently unknown or unavailable responses,¶ (2) risk management approaches suitable for such deeply¶ uncertain risks, and (3) enhanced institutions at all levels¶ of governance (including internationally) able to implement¶ these risk management approaches. Such innovation could¶ also enhance risk reduction for the better-understood risks¶ in the lower left-hand corner of the figure.¶ The geographic scale of the consequences of a risk is¶ not the same as the geographic scale of the most-appropriate¶ responses to a risk. Many of the risks shown in Figure 3¶ might be best addressed with a coordinated global response¶ to most effectively prevent or address the consequences¶ regardless of where disaster strikes.¶ Risk Management Interventions¶ Because a global catastrophic risk management strategy¶ may include many different types of actions, thinking¶ broadly about opportunities to intervene to manage risks is¶ necessary (see Figure 4). For example, reduction or prevention of the onset of a threat or hazard might be possible.¶ When neither of those is possible or successful, opportunities could arise to disrupt the mechanisms that lead to¶ harmful consequences. Furthermore, there might be ways to¶ reduce the severity of effects should they occur. And, when¶ all else fails, options exist to recover from the effects.¶ Preventing Impact¶ As of early 2024, risk mitigation strategies targeted to¶ prevent catastrophic impact from the six assessed hazards¶ and threats spanned stages of development and capability.¶ Approaches for the least-mature cases are theoretical and¶ untested (e.g., draining heat from the magma chamber of a¶ supervolcano or in-space deflection of large impactor asteroids and comets). Also, some risk management approaches¶ Figure 5 Types of Approaches Available to Manage Global Catastrophic and Human Existential Risks,¶ by Mitigation Dimension and by Threat or Hazard¶ Reduce the¶ likelihood of¶ occurrence.¶ Disrupt the¶ mechanisms¶ leading to¶ the risk.¶ Reduce the¶ severity of¶ the effects.¶ Severe¶ Pandemic¶ Climate¶ Change Nuclear War Asteroid and¶ Comet Impact AI Supervolcanoes¶ Not¶ applicable¶ Governance and policy Technical and logistical Research and development¶ Enhance¶ response¶ and recovery.¶ 10¶ might be well studied, tested, and more mature but depend¶ on controlling human behaviors, such as curtailing greenhouse gas emissions or preventing nuclear war. In the case¶ of AI, both current and future threats remain uncertain.¶ Nevertheless, governmental and nongovernmental organizations have produced frameworks to help prevent the¶ deployment of systems that could cause harm, and the AI¶ community has proposed risk management strategies, such¶ as international technical standards, regulations, voluntary¶ self-regulation, and market pressures.¶ Reducing Consequences of Impact¶ Strategies to reduce the severity of hazard or threat impact¶ also vary but can closely align with existing emergency¶ preparedness frameworks when considering response and¶ recovery options. Even so, the most-salient approaches¶ should be determined by characteristics of the risks posed¶ by each hazard and threat. For example, reducing the consequences of climate change or nuclear war involves building¶ resilience in affected or potentially affected communities¶ through such actions as relocating at-risk populations or¶ building shelters. Preparing for a supervolcano or a large¶ asteroid impact can take a similar approach through evacuation planning. These approaches will require significant¶ investment in governments’ and communities’ research and¶ development of early-warning systems and preparedness¶ planning. With respect to reducing the severity of pandemics, recent examples of vaccine hesitation and mistrust¶ among the public show that government institutions will¶ need to improve strategic communication and work to build¶ trust with communities, in addition to pursuing accelerated¶ vaccine development and distribution.¶ Three Types of Risk Mitigation Efforts¶ As presented in Figure 5, investments in risk management¶ options can be grouped by the following three categories:¶ • taking action: Many risk mitigation efforts identified in the researchers’ assessments involve technical¶ or logistical measures that can be implemented to¶ prevent or reduce risks.¶ • governing: Some of the identified risk mitigation¶ options involve using regulations and laws, policies,¶ or norms to influence actions and behaviors in ways¶ that reduce risks.¶ • learning: For some hazards and threats, there might¶ not be options or enough knowledge about risks to¶ either act or govern, and research and development¶ are necessary before more-active steps can be taken.¶ Investments in risk management can¶ involve technical or logistical measures¶ to prevent or reduce risk, governance¶ and policy to influence actions and¶ behaviors to reduce risk, or research¶ and development if not enough is¶ known about the risk to take action.¶ 11¶ Technical and logistical approaches are most relevant¶ for those threats and hazards that are better understood¶ and for which solutions are readily available, such as managing the effects of nuclear detonations, natural hazards¶ exacerbated by climate change, and efforts involving public¶ warnings, evacuations, and incident response and recovery.¶ Although such solutions can directly reduce risk, they can¶ also be costly and require attention to planning and evaluation to ensure effective implementation.¶ Governance and policy approaches are relevant where¶ risks result from human behaviors and economic activity.¶ For example, regulations and policies can be established to¶ prevent or minimize the misuse or development of dangerous AI and biotechnology or to reduce emissions of carbon into the atmosphere. Governance approaches also include

# 2NC

## T/L

#### 1---Inefficient regulation – it hamstrings deployment and drives up costs.

Matthew Wright, 7-5-2023, "The Nuclear Regulatory Commission is killing nuclear energy", Mackinac Center, <https://www.mackinac.org/blog/2023/the-nuclear-regulatory-commission-is-killing-nuclear-energy> [Matthew Wright was a research intern, and former energy and environmental policy intern, at the Mackinac Center for Public Policy. He also graduated from Michigan State University] DOA: 3/30/2025 //RRM

“It’s simple economics. Nuclear has become obsolete,” writes Haley Zeremba, a journalist for Energy Central. “Decades of roadblocks and rising prices are standing in the way” of a viable nuclear industry, Business Insider adds. But just how simple are the economics? It is true that nuclear power comes with enormous up-front costs, and a new nuclear plant takes years to build. Even while the market is hungry for carbon-free sources of electricity, nuclear lags far behind the competition. This is due in large part to overbearing regulators who choke off the nuclear industry. Right now nuclear energy is the most expensive type of energy, costing about $5,500 on the low end and around $8,100 on the high end. Natural gas, by comparison, costs around $1,200 per kilowatt. Nuclear power plants are notoriously capital-heavy investments and can cost from $14 billion to $30 billion from start to finish. To license, build, and connect a plant to the grid can take anywhere from 10 to 20 years under the current system. The problem isn’t with nuclear power itself but with America’s approach to the nuclear industry. The IAEA (International Atomic Energy Agency) finds that in France and Germany the average time to build a reactor is around six and a half years, and in Japan it’s slightly above five years. According to the World Nuclear Association, after 1977 and up until 2013, there were no new nuclear plants beginning construction in the United States. The body responsible for regulating nuclear energy in the United States is the Nuclear Regulatory Commission. This commission regulates nuclear power through a licensing system. The prospective nuclear operator needs to get the design approved, receive site and safety approval, allow constant construction oversight, pass a final safety inspection, and receive an operating license to begin commercial activity. Each step of this process can take multiple years and adds considerable costs to a project. As of 2023, according to the Department of Energy, completing the regulatory requirements and obtaining a license can cost as much as $1.5 billion. According to Jack Devanney in his book, “Why Nuclear Power Has Been a Flop,” nuclear power would be much cheaper than other forms of electricity if it were “efficiently regulated.” But the Nuclear Regulatory Commission has a strong incentive to regulate the industry with as little efficiency as possible. Regulators are motivated by incentives. They want to justify their positions and keep their jobs. They get no credit if a plant runs smoothly but bear the responsibility if a plant has a problem. The regulator is thus incentivized to approve almost nothing. The Nuclear Regulatory Commission is required to charge applicants large fees to “recover approximately 90% of its annual budget from the companies and people that we provide services to (e.g., applicants for NRC licenses, NRC licensees, etc)”. The most attractive option for the commission is to keep the application process going for as long as humanly possible in order to recover as much money as possible before the applicant gets a final operating license. It wasn’t always like this. The Atomic Energy Commission, the NRC’s predecessor, had the dual responsibility of both regulating and promoting nuclear energy. The commission had an incentive to grow the nuclear industry, not just to regulate it. The AEC was replaced by the NRC in 1974. Since the current commission began operations, the time it takes to build a nuclear plant has doubled. Under the Atomic Energy Commission, a plant could be completed and operational in about five to ten years. After the NRC’s founding, the average time jumped to around 10-20 years to get a plant operational. Construction costs were around $1,000 to $3,000 per kilowatt of capacity (adjusted for inflation) under the Atomic Energy Commission. The Nuclear Regulatory Commission has brought the average cost up to between $5,500 and 8,100 per kilowatt of capacity. The Nuclear Regulatory Commission acts as a roadblock for nuclear energy rather than as an effective regulator of an important industry. The NRC should either commit once again to promoting this carbon-free form of reliable energy or change its name to the “Nuclear Prevention Commission.”

#### 3---Tech advancements – each iteration creates new risks and claims about improvements have no empirics to back them up.

Union of Concerned Scientists, 03-18-2021, "Report Finds That ‘Advanced’ Nuclear Reactor Designs Are No Better Than Current Reactors—and Some Are Worse", <https://www.ucs.org/about/news/report-advanced-nuclear-reactors-no-better-current-fleet> [The Union of Concerned Scientists (UCS) is a national nonprofit organization founded more than 50 years ago by scientists and students at the Massachusetts Institute of Technology. Our mission: The Union of Concerned Scientists puts rigorous, independent science into action, developing solutions and advocating for a healthy, safe, and just future. Today, we are a group of nearly 250 scientists, analysts, policy experts, organizers, and communicators dedicated to that purpose.] DOA: 3/30/2025 //RRM

WASHINGTON (March 18, 2021)—A report released today by the Union of Concerned Scientists (UCS) analyzed the designs of a number of so-called “advanced” non-light-water nuclear reactors currently in development and found that they are no better—and in some respects significantly worse—than the light-water reactors in operation today.

The 140-page report, “Advanced” Isn’t Always Better, assesses the pros and cons of three main types of non-light-water reactors: sodium-cooled fast reactors, high-temperature gas-cooled reactors, and molten salt-fueled reactors. It rates them on three broad criteria: safety and security; nuclear proliferation and terrorism risks; and “sustainability,” which refers to how efficiently they use uranium and how much long-lived nuclear waste they generate.

“If nuclear power is to play a larger role to address climate change, it is essential for new reactor designs to be safer, more secure, and pose comparable or—better yet—lower risks of nuclear proliferation and nuclear terrorism than the existing reactor fleet,” says report author Dr. Edwin Lyman, a physicist and director of nuclear power safety at UCS. “Despite the hype surrounding them, none of the non-light-water reactors on the drawing board that we reviewed meet all of those requirements.”

The report takes a close look at unsubstantiated claims developers are making about their designs, which are largely based on unproven concepts from more than 50 years ago. With little hard evidence, they assert that their reactors have the potential to lower costs, reduce nuclear waste, burn uranium more efficiently, strengthen safety, and lower the risk of nuclear proliferation.

One of the proposed sodium-cooled fast reactors, TerraPower’s 345 megawatt Natrium, has received considerable media attention recently because TerraPower founder Bill Gates has been citing it during interviews about his new book, How to Avoid a Climate Disaster. In mid-February, Gates told 60 Minutes correspondent Anderson Cooper that the Natrium reactor will produce less nuclear waste and be safer than a conventional light-water reactor.

In fact, according to the UCS report, sodium-cooled fast reactors such as the Natrium would likely be less “uranium-efficient.” They would not reduce the amount of waste that requires long-term isolation in a geologic repository. They also could experience safety problems that are not an issue for light-water reactors. Sodium coolant, for example, can burn when exposed to air or water, and a sodium-cooled fast reactor could experience uncontrollable power increases that result in rapid core melting.

“When it comes to safety and security, sodium-cooled fast reactors and molten salt-fueled reactors are significantly worse than conventional light-water reactors,” says Dr. Lyman. “High-temperature, gas-cooled reactors may have the potential to be safer, but that remains unproven, and problems have come up during recent fuel safety tests.”

Timing is also an issue. Some developers promise that they can demonstrate, license and deploy their non-light-water reactors on a commercial scale as early as the end of this decade, enabling them to address the climate crisis in the near term. For example, last fall the Department of Energy (DOE) gave both TerraPower and X-Energy, developer of a high-temperature, gas-cooled “pebble-bed” reactor, $80 million grants to begin operating first-of-a-kind commercial units by 2027, most likely at the Columbia Generating Station site in Washington.

According to the report, if federal regulators require the necessary safety demonstrations, it could take at least 20 years—and billions of dollars in additional costs—to commercialize non-light-water reactors, their associated fuel cycle facilities, and other related infrastructure.

“One of the new reactor designs being considered, the ‘breed-and-burn’ reactor, has the most potential because it doesn’t require reprocessing—or recycling—spent nuclear fuel, which poses unacceptable proliferation risks,” says Dr. Lyman. “But the concept is still saddled with considerable technical obstacles and safety hazards due to the fact that fuel would remain in the reactor longer than in a light-water reactor, allowing fission gases and pressure to build.”

The report recommends that the DOE suspend its advanced reactor demonstration program until the Nuclear Regulatory Commission determines whether it will require full-scale prototype tests before licensing any designs for commercial deployment, which the report argues are essential. It also calls on Congress to require the DOE to convene an independent commission to review the technical merits of all proposed non-light-water reactors and only approve projects with a high likelihood of commercialization that are clearly safer and more secure than the current fleet. Finally, the DOE and Congress should consider spending more research and development dollars on improving the safety and security of light-water reactors, rather than on commercializing immature, overhyped non-light-water reactor designs.

## AT: C1

### Heg

#### 1---Hold the line. All of their link evidence is a collection of buzzwords and there is zero coherent reason as to why prolif standards or competitiveness constitutes the lynchpin to hegemony - no new extrapolations in the back half, shiftiness prevents effective clash

#### 2---Hilbrun is about proliferation standards which is the only delineated link between nuclear energy and heg

#### 3---Whoops --- zeroed the 1AC -- alt causes in the uniqueness zero solvency

**1AC Warner 25** (Daniel Warner is the author of An Ethic of Responsibility in International Relations. (Lynne Rienner),February 14, 2025,“The United States is Falling Apart and the World is Taking Notice”, Counterpunch,[https://www.counterpunch.org/2025/02/14/the-united-states-is-falling-apart-and-the-wo rld-is-taking-notice/](https://www.counterpunch.org/2025/02/14/the-united-states-is-falling-apart-and-the-world-is-taking-notice/), DOA 3/11/25) KC

The United States is imploding. The reign of Donald Trump is not only challenging and threatening the very foundations of its constitutional democracy, it is calling into question the U.S.’s post-World War II hegemonic role. Empires or hegemonic powers rise and fall. **Often they are defeated by emerging powers.** Sometimes their decline takes place over time. But rarely do they self-destruct as spectacularly as the U.S. is doing. The U.S. implosion is dramatic in its intensity and rapidity. **In just over three weeks, Donald Trump has been able to redefine the United States’ position in the world from a global power to an international outcast**. Despite whatever military and economic power the U.S. still has, its image and global leadership have been undermined by President Trump’s foreign policy decisions. The word “implode” is rarely used in international relations. The decline of empires or hegemonic powers is usually due to external forces. The Roman Empire fell because of a series of invasions by “barbarian tribes.” The Ottoman Empire fell because it aligned with Germany during World War I and was formally dismantled after the War because it had chosen the losing side. The United States is now in the throes of losing its global position by an implosion based on President Trump’s policies. Internationally, Trump has undermined the U.S.’s global image and influence by systematically provoking allies, neutrals and competitors. **Besides targeted tariff threats and proposals for territorial expansion into Greenland, Panama and Canada, the president has made two policy decisions that have led to universal condemnation with major global repercussions**. The first is his decision to gut the United States Agency for International Development (A.I.D.). While there are certainly inefficiencies in any institution that spent $38 billion in 2023 and operates in 177 different countries, A.I.D. has been fundamental in projecting a positive American image throughout the world. As an example of its outreach, Samantha Power, the former administrator of A.I.D., wrote in The New York Times how out of the $38 billion spent, “nearly $20 billion was for health programs (such as those that combat malaria, tuberculosis, H.I.V./AIDS and infectious disease outbreaks) and humanitarian assistance to respond to emergencies and help stabilize war-torn regions…Other U.S.A.I.D. investments…pay dividends in the longer term, such as giving girls a chance to get an education and enter the work force, on growing local economies.” Foreign assistance is all about human capital. It is a crucial element in projecting soft power. When President John F. Kennedy established A.I.D. in 1961, he said in a message to Congress; “We live at a very special moment in history. The whole southern half of the world–Latin America, Africa, the Middle East, and Asia–are caught up in the adventures of asserting their independence and modernizing their old ways of life. These new nations need aid in loans and technical assistance just as we in the northern half of the world drew successively on one another’s capital and know-how as we moved into industrialization and regular growth.” He acknowledged that the reason for the aid was not totally altruistic, “**For widespread poverty and chaos lead to a collapse of existing political and social structures which would inevitably invite the advance of totalitarianism into every weak and unstable area.** Thus our own security would be endangered and our prosperity imperilled. A program of assistance to the underdeveloped nations must continue because the nation’s interest and the cause of political freedom require it.” The fear of Communism was obvious in 1961. The motivation behind U.S. foreign assistance is always humanitarian and political at the same time; the two can never be separated. Today, the United States is competing with China and its Belt and Road Initiative for global influence. Trump’s freezing and defunding U.S. foreign assistance is not a defeat to China; it’s a default, a no-show. Defunding and freezing foreign assistance effects millions of people throughout the world and invites even allies to look to China as a partner in trade and development. Whereas the A.I.D. example is an excellent case study of a major power purposefully retreating globally (withdrawal from the World Health Organization and the Paris Accord on climate change included), Trump’s proposal for the Gaza Strip is an outright, active, foreign policy autogoal. (A former advisor to Bernie Sanders called it Trump’s “apocalyptic daydream.”) Trump’s insistence that the United States will take control of Gaza, evicting almost two million people from their homeland in order to create a place “better than Monaco,” “the Riviera of the Middle East,” has generated international condemnation. “Forcible displacement of an occupied group is an international crime, and amounts to ethnic cleansing,” Navi Pillay, chair of the United Nations Commission of Inquiry on the Occupied Palestinian Territory, told Politico. “There is no way under the law that Trump could carry out the threat to dislocate Palestinians from their land,” she said. Politically, the Foreign Ministry of Saudi Arabia, a key actor in stabilizing relations in the Middle East, forcefully dismissed the proposal; “Saudi Arabia also reiterates its previously announced unequivocal rejection of any infringement on the legitimate rights of the Palestinian people, whether through Israeli settlement policies, the annexation of Palestinian lands, or attempts to displace the Palestinian people from their land,” it said. Egypt, Jordan and other Arab countries have also rejected the plan. King Abdullah II of Jordan gracefully avoided directly responding to the plan during his joint press conference with Trump. But following the meeting, the King said on X, “I reiterated Jordan’s steadfast position against the displacement of Palestinians in Gaza and the West Bank. This is the unified Arab position.” The only country who seem pleased is Israel, with Prime Minister Netanyahu smiling like a Cheshire cat listening to Trump present the plan during their joint press conference. In three weeks, Donald Trump has imploded whatever positive image the United States might have had internationally. While he may think he is doing what his MAGA followers want, international reactions – save Israel’s – are further nails in the coffin of United States hegemony

## AT: C2

#### 1] If you’re hungry, how are you fighting?

Idean **Salehyan** **14**, Political Science at the University of North Texas, “Climate change and conflict: Making sense of disparate findings,” Political Geography 43, https://www.sciencedirect.com/science/article/pii/S0962629814000997

The third dimension on which research differs has to do with the social scale that is being studied. By social scale, I mean the degree of coordination among individuals and organizational resources needed to undertake collective action. Environmental variables may affect an individual's propensity to resort to violence and crime (Rotton & Cohn, 2003); relatively unorganized protests and riots (Hendrix & Salehyan, 2012); rebellion by organized, armed actors (Burke et al., 2009); and international conflict between states (Tir & Stinnett, 2012). Results for one type of social phenomenon may not be commensurable with other types of behavior. Moreover, causal relationships are likely to differ; the causal chain leading from water scarcity to communal conflict between farmers and pastoralists may look very different when examining conflict between nation-states over water resources. The same variables that influence conflict between states, which are highly organized entities, may not apply to conflict between individuals and vice-versa. To illustrate how social scale matters, take for example a pair of studies by Hendrix and Salehyan (see Hendrix and Salehyan, 2012, Salehyan and Hendrix, 2014). In the first study (Hendrix & Salehyan, 2012), we show that abnormally high and abnormally low levels of rainfall, which can both disrupt normal agricultural practices, predict social conflict events such as sporadic protests and riots. These types of unrest are usually short-lived, require relatively little sustained commitment, and have limited degrees of organization. By contrast, **armed** **conflict**—which requires a long-term commitment by ‘professional’ militant organizations—declines during periods of low rainfall and **resource** **scarcity** (Salehyan & Hendrix, 2014). Such groups need **food** and supplies in order to maintain a **rebel** **army**, and find it **more** **difficult** to **sustain** their operations under **conditions of environmental** **distress**. Thus, in looking at different scales of social organization, the effect of a similar set of independent variables may differ.