

## 1NC---DA---NRC

### **NRC increases inspections now.**

**Goldfin '23** [Robert P. Goldfin and Jane Accomando, 12-22-2023, "NRC to Increase Focus on Appendix B Compliance in View of FY2023 Enforcement Findings," No Publication, <https://www.morganlewis.com/blogs/upandatom/2023/12/nrc-to-increase-focus-on-appendix-b-compliance-in-view-of-fy2023-enforcement-findings>, DOA: 3/30/2025] JZ + shaan

**The US Nuclear Regulatory Commission (NRC) recently published its annual vendor newsletter.** The Vendor Times, documenting findings of NRC vendor inspection staff and lessons learned related to the vendor inspection program. The newsletter follows the NRC's November 20 vendor inspection program self-assessment for fiscal year 2023. Through these two issuances, the NRC **noted an increase in enforcement findings and indicated that it will focus on 10 CFR Part 21 and supplier oversight compliance during future inspections.**

FY2023 Vendor Inspection Metrics

**In fiscal year 2023, the NRC vendor inspection staff conducted 22 inspections for operating reactors, including 18 vendor inspections, one licensing audit, and three observations of Nuclear Procurement Issues Corporation audits.** These compliance monitoring actions led the NRC to **issue 12 notices of nonconformance (NOCs) and four notices of violation (NOVs) for eight vendors, an overall increase in the total number of findings over fiscal year 2022.** None of the NOCs or NOVs were contested.

The NRC identified that this increase in NOCs and NOVs is mainly in the areas of corrective actions, 10 CFR Part 21, and supplier oversight. Therefore, the **NRC stated it will focus on these areas during future inspections and stress the importance of adequately implementing correction action** and 10 CFR Part 21 programs to vendors. With respect to supplier oversight, the NRC will focus on the areas of commercial-grade dedication and supplier audits.

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NRC vendor inspection staff also supported 47 allegation actions during fiscal year 2023, one of which resulted in a reactive inspection.

Lessons Learned

**The NRC continues to support the implementation of Inspection Procedure** (IP) No. 71111.21N.03, Commercial Grade Dedication, last revised in March 2023. To that end, NRC staff **supported technical process and inspection implementation training for regional inspectors,** including tabletop scenario discussions, and engaged in discussions with stakeholders to provide clarity on the IP.

The **NRC will carry out inspections through 2026, and each nuclear plant site will have an inspection.** As of October 2023, the NRC has completed 20 inspections, identifying seven noncited violations. The NRC identified the following common themes associated with the noncited violations:

### **The AFF strains resources.**

**Gilbert 21** [Alex Gilbert, 5-15-2021, A complex systems researcher with expertise in nuclear innovation, space mining, energy markets, and climate policy. "Unlocking Advanced Nuclear Innovation: The Role of Fee Reform and Public Investment," No Publication, <https://www.nuclearinnovationalliance.org/unlocking-advanced-nuclear-innovation-role-fee-reform-and-public-investment>, DOA: 3/30/2025] JZ + shaan

**Due to the limited resources and flexibility, NRC was unable to proactively develop rules and perform technical activities for advanced reactors.** Many of these are now **being done on an adhoc basis for individual applications.** The current fee model **creates uncertainty for developers, customers, and investors as NRC**

reviews of advanced reactors can be lengthy and thus involve unexpected and open-ended licensing review costs. While the NRC regulations require fees to recover “full cost” of NRC’s review, there is no way to predict what that “full cost” will be and therefore what the fees will be. In some cases, at the time that NRC accepts an application for review, it has provided an estimate of how much the fees will be. But that estimate is only an estimate. The applicant is still responsible for the full cost, regardless of the estimate.

Congress addressed some of these concerns when it passed NEIMA (See Section 2.c.). Off-fee funding in NEIMA and subsequent legislation are providing initial resources for NRC activities to build advanced reactor regulatory infrastructure. While NIA applauds these activities, expanded and more durable public resources are needed to ensure NRC remains a global leader in nuclear regulation. In addition, a more holistic review and revision to NRC’s fee structure can address the underlying issues that NEIMA attempted to address.

Fees are an important consideration for commercializing advanced reactors, and near-term licensing activities make reconsideration of licensing fees an urgent imperative. In the case of fees collected for NuScale’s recent design certification, estimated upfront licensing fees were equivalent to at least 10-15 years of annual fees for operating facilities. <sup>12</sup> These costs could be even more significant for combined or operating license applicants who must recoup fees through revenues from a specific and limited customer base. As licensing fees occur at the beginning of the project, they require equity or debt servicing until operation commences, and can have large impacts on a project’s net present value. Therefore, even though fees are only a small part of a project’s lifecycle cost, they can have disproportionate impacts on early-stage projects and even discourage consideration of nuclear energy in the first place.

Today, NRC’s regulatory framework for licensing reviews is largely predicated on review of large light-water reactors. To apply this framework to advanced reactors requires extensive company and staff work to identify non-applicability of regulations, exemptions, and other adaptations. This can cause initial advanced reactor reviews to take longer and cost more than historical reviews. This conflicts with the general principle of risk-informed, performance-based regulation. Advanced reactors are expected to be significantly safer than past designs, and the fees incurred should be reflective of the enhanced safety, rather than a result of inefficient requirements. Until regulations are modernized, fees pose additional undue burdens on innovators and may be costlier compared to licensing with performance-based regulatory frameworks in other countries.

**That causes decreased oversight.**

**CBS ‘19** [CBS News, 7-17-2019, CBS News is the news division of the American television and radio broadcaster CBS. It is headquartered in New York City. "Nuclear Regulatory Commission mulls cutting back on inspections at nuclear reactors," No Publication, <https://www.cbsnews.com/news/nuclear-regulatory-commission-mulls-cutting-back-on-inspections-at-nuclear-reactors/>, DOA: 3/30/2025] JZ

Washington – The staff of the Nuclear Regulatory Commission is recommending that the agency cut back on inspections at the country's nuclear reactors, a cost-cutting move promoted by the nuclear power industry but denounced by opponents as a threat to public safety.

The recommendations, made public Tuesday, include reducing the time and scope of some annual inspections at the nation's 90-plus nuclear power plants. Some other inspections would be cut from every two years to every three years.

Some of the staff’s recommendations would require a vote by the commission, which has a majority of members appointed or reappointed by President Trump, who has urged agencies to reduce regulatory requirements for industries.

The nuclear power industry has prodded regulators to cut inspections, saying the nuclear facilities are operating well and that the inspections are a financial burden for power providers. Nuclear power, like coal-fired power, has been struggling in market competition against cheaper natural gas and rising renewable energy.

While Tuesday's report made clear that there was **considerable disagreement among the nuclear agency's staff on the cuts, it contended the inspection reduction "improves efficiency"** while still helping to ensure reasonable assurance of adequate protection to the public."

Commission member Jeff Baran criticized the proposed changes Tuesday, saying **reducing oversight of the nuclear power industry "would take us in the wrong direction."**

"NRC shouldn't perform fewer inspections or **weaken its safety oversight to save money,"** Baran said.

The release comes a day after Democratic lawmakers faulted the NRC's deliberations, saying they had failed to adequately inform the public of the changes under consideration.

"Cutting corners on such critical safety measures may eventually **lead to a disaster that could be detrimental to the future of the domestic nuclear industry,**" Rep. Frank Pallone, D-N.J., chair of the House Energy and Commerce Committee, and other House Democrats said in a letter Monday to NRC Chairwoman Kristine Svinicki.

## **Extinction!**

**Wasserman '08** [Harvey Wasserman, Author of The Last Energy War, 2008; "Nuclear Power and Terrorism"; Earth Island Journal;

[https://www.earthisland.org/journal/index.php/magazine/entry/nuclear\\_power\\_and\\_terrorism](https://www.earthisland.org/journal/index.php/magazine/entry/nuclear_power_and_terrorism);  
accessed 03-07-2025] leon

**A terrorist assault at Indian Point could yield three infernal fireballs of molten radioactive lava burning through the earth and into the aquifer and the river.** Striking water, **they would blast gigantic billows of horribly radioactive steam into the atmosphere.** Thousands of square miles would be saturated with **the most lethal clouds ever created, depositing relentless genetic poisons that would kill forever.**

**Infants and small children would quickly die en masse.** Pregnant women would spontaneously abort or give birth to horribly deformed offspring. Ghastly sores, rashes, ulcerations and burns would afflict the skin of millions. **Heart attacks, stroke and multiple organ failure would kill thousands on the spot.** Emphysema, hair loss, nausea, inability to eat or drink or swallow, diarrhea and incontinence, sterility and impotence, asthma and blindness would afflict hundreds of thousands, if not millions.

**Then comes the wave of cancers, leukemias, lymphomas, tumors and hellish diseases for which new names will have to be invented.**

Evacuation would be impossible, but thousands would die trying. **Attempts to quench the fires would be futile. More than 800,000 Soviet draftees forced through Chernobyl's seething remains in a futile attempt to clean it up are still dying from their exposure.** At Indian Point, the **molten cores would burn uncontrolled for days, weeks and years.** Who would volunteer for such an American task force?

The immediate damage from an Indian Point attack (or a domestic accident) would render all five boroughs of New York City an apocalyptic wasteland.

As at Three Mile Island, where thousands of farm and wild animals died in heaps, **natural ecosystems would be permanently and irrevocably destroyed.** Spiritually, psychologically, financially and ecologically, our nation would never recover.

This is what we missed by a mere 40 miles on September 11. Now that we are at war, this is what could be happening as you read this.

**There are 103 of these potential Bombs of the Apocalypse operating in the US.** They generate a mere 8 percent of our total energy. Since its deregulation crisis, California cut its electric consumption by some 15 percent. Within a year, the US could cheaply replace virtually all the reactors with increased efficiency.

Yet, as the terror escalates, Congress is fast-tracking the extension of the Price-Anderson Act, a form of legal immunity that protects reactor operators from liability in case of a meltdown or terrorist attack.

Do we take this war seriously? Are we committed to the survival of our nation?

If so, the ticking reactor bombs that could obliterate the very core of our life and of all future generations must be shut down.

## 1NC---Prolif

### Alliances are strong.

**Suh '24** [Liviu Horovitz; Senior Associate Researcher at the Centre for Security, Diplomacy and Strategy; Elisabeth Suh; research fellow in DGAP's Center for Security and Defense; 08-21-2024; "Trump II and US Nuclear Assurances in the Indo-Pacific"; SWP; <https://www.swp-berlin.org/10.18449/2024C36/>; accessed 11-04-2024] leon

While heated debates in Europe have focused on how to respond **if Donald J. Trump is re-elected to the White House, discussions in Australia, Japan, and South Korea reveal a greater sense of confidence in Washington's commitments.** The fear that the United States would withdraw its nuclear assurances is much less pronounced in the Indo-Pacific than in Europe. **This serenity appears primarily grounded in a shared understanding that a bipartisan consensus is driving the US commitment to contain China's rise – a goal that requires reliable allies across the Pacific.** At the same time, US allies want to maintain the regional status quo and are willing to support Washington's efforts. **Trump's potential return does little to change these structural incentives.** Instead, Pacific allies fear challenges to the East Asian regional order, challenges that are also relevant for Europe's security and prosperity.

### Nuclear exports are low.

**Park '23** [Jackie; BA from Duke University, Writer @ Power Technology; December 11; Power Technology; "Global nuclear power faces unprecedented challenges," <https://www.power-technology.com/news/global-nuclear-power-faces-unprecedented-challenges/>; DOA: 3-26-2025] tristan

In a stark revelation, **the World Nuclear Industry Status Report (WNISR) has outlined the severe challenges faced by the global nuclear power sector in recent years.** The report, covering developments up to mid-2023, highlights a significant decline in nuclear production, with **its share dropping to the lowest point in four decades.** This **decline is attributed to a combination of factors including national policy shifts, economic pressures and the rapid growth of renewable energy alternatives.**

Global nuclear production and generation reaches new low

The WNISR points out that global nuclear power generation experienced a notable 4% decline, reaching a level not seen since the mid-1990s. Outside of China, the decrease was even more pronounced, at 5%, taking the global nuclear energy share of commercial gross electricity generation in 2022 down to 9.2%. This marks the most substantial drop since the aftermath of the Fukushima disaster in 2012 and a record low in the past four decades. It is noteworthy that this share is now little more than half of its peak of 17.5% in 1996.

Several major nuclear-producing nations faced significant challenges in 2022 and mid-2023, contributing to the overall hit on the global nuclear landscape.

The US saw its nuclear share of commercial electricity generation drop to 18.2%, the lowest level in 25 years. France experienced a drop in nuclear generation below its 1990 level, turning into a net importer of electricity for the first time since 1980. However, the country seems motivated to rectify the situation, recently leading a group of 20 countries in declaring to "triple nuclear energy capacity from 2020 by 2050" at COP28 in Dubai.

Belgium witnessed the closure of two reactors, in September 2022 and January 2023, with three more slated for closure by 2025. Germany saw the closure of its last three operating reactors on 15 April 2023, completing the phase-out policy initiated in 2011.

**The report notes that the number of closed power reactors reached 212 units as of mid-2023, with 22 fully decommissioned and 11 released from regulatory control.** With this, the report indicates that 407 reactors with a total capacity of 365GW were operational worldwide – a decrease of four reactors compared with the previous year and 31 units below the peak observed in 2002.

Economic challenges and renewable competition

**Nuclear power faces increasing economic challenges**, with Lazard modelling indicating that, at discount rates over 5.4%, it becomes **the most expensive generator in terms of the levelized cost of energy** (LCOE).

National developments of major nuclear-producing countries reflect this reality. The report highlights massive subsidies in the US, with state-level taxpayer-funded subsidies estimated to exceed \$15bn by 2030. The UK, now operating only nine nuclear units, has seen cost estimates for the two Hinkley Point C reactors soar to \$44bn (£34.98bn) and grid connection delayed until June 2027. South Korea's state-owned utility, KEPCO, recently faced a record loss of \$25bn (33.01trn won), with a 32% rise in net debt to an unprecedented \$149bn.

The report also underscores the underestimated hidden costs associated with nuclear power, including decommissioning expenses and liabilities for accidents. Decommissioning costs in Germany, Italy and Lithuania, all nuclear phase-out countries, were estimated to be orders of magnitude higher than international estimates. Meanwhile, the Japanese Government estimated the cost of the 2011 Fukushima accidents at an astonishing \$223bn (¥32.62trn) – the largest in the world.

Nuclear finances are even more alarming when compared with renewable alternatives. **Renewable energy continues to outpace nuclear power**, with total investment in non-hydro renewable electricity capacity reaching a record \$495bn in 2022, **14-times the investment in nuclear power plant construction**. Wind and solar facilities alone generated 28% more electricity than their nuclear counterparts, accounting for 11.7% of global electricity generation, compared with nuclear's 9.2%.

In terms of LCOE, the report highlights that nuclear power can be nearly four-times the LCOE of onshore wind at a discount rate of 10%. In the US, unsubsidised solar and wind, with rapidly declining firming costs, have a combined cost of \$45–140 per megawatt-hour (MWh) in comparison with new nuclear at a mean \$180/MWh.

Uncertain future for global nuclear industry

The global nuclear industry confronts an uncertain future, paired with concerning new developments in the sector.

In the report, one country stood out for going against the current as it continues to dominate the global nuclear market – Russia.

While **China leads in the domestic number of reactors** under construction with 23 ongoing, Russia dominates the international market with 24 units under construction, including 19 in seven other countries. Russia has also brought on new technology, notably developing the first and only floating nuclear power plant in the world.

However, according to the report, **construction delays plague many Russian projects, with 93% of ongoing constructions taking place in Nuclear Weapon States (NWS) or by NWS-controlled companies abroad**.

In addition, **both China and Russia have been tied to recent revelations about cyberattacks on Sellafield**, a nuclear site located on the Cumbrian coast in the UK, by groups with close ties to the two countries. The investigation raised eyebrows about the state of cybersecurity for nuclear sites.

**The report also notes that Small Modular Reactors (SMRs) have not seen significant progress in the past year, with no units under construction** in the western world. The most advanced project, based in the US and involving NuScale, terminated in November 2023 due to a 75% increase in the cost estimate. Canada, nevertheless, plans to build four SMRs in Ontario, arguing that they will contribute C\$15.3bn (\$11.25bn) to Canada's gross domestic product.

**Substantial investment necessitates huge exports---that perceptually fuels conflict.**

**Gilinsky '14** [Victor Gilinsky; Former commissioner of the Nuclear Regulation Commission; Henry Sokolski; Executive Director of NPEC; 02-25-2014; "Victor Gilinsky and Henry Sokolski: Serious Rules for Nuclear Power without Proliferation (Working Paper 1302)"; Nonproliferation Policy Education Center; <https://npolicy.org/victor-gilinsky-and-henry-sokolski-serious-rules-for-nuclear-power-without-proliferation-working-paper-1302/>; accessed 03-22-2025] //dg

The usual reference is to President Kennedy's 1962 statement that 15 to 25 countries could obtain nuclear weapons. But this was a warning, not a prediction, and a useful one that led to nonproliferation efforts that slowed the process. In **view of our experiences with countries falsely claiming to be conducting —peaceful nuclear programs and later using their facilities for illicit activities or conducting clandestine bomb activities— in India, Iran, Iraq, Israel, North Korea, Pakistan, South Africa, and Syria**—it is time to heed these warnings again.

There is also a school of thought that even if some more countries obtained nuclear weapons it wouldn't make much difference because they would just serve as deterrents.<sup>1</sup>

There is a troubling disconnect between this cheerful theorizing—which is not without an element of self-interest—and any awareness of the devastating possibility of nuclear war. Just because the weapons are supposed to be for deterrence doesn't mean they won't be used. Such use is after all implied in the threat that underlies deterrence. And if they are used they are likely to profoundly change the way the world is organized, with unpredictable but likely unhappy consequences. <sup>2</sup> A few years ago Henry Kissinger wrote:

**If one imagines a world of tens of nations with nuclear weapons and major powers trying to balance their own deterrent equations, plus the deterrent equations of the subsystems, deterrence calculation would become impossibly complicated. To assume that, in such a world, nuclear catastrophe could be avoided would be unrealistic.**<sup>3</sup>

Happily, we have not reached this state. No such weapons have exploded in anger since World War II, and it is a long time since people have seen the results of atmospheric tests. But this has also meant there is not the gut level consciousness about proliferation dangers that there is about the dangers of nuclear accidents. Whereas everyone agrees that expanded use of nuclear power has to be predicated on tough safety rules, there is no corresponding agreement when it comes to rules to protect against nuclear weapons spread, especially when it comes to restrictions on nuclear power programs.

**One often hears from nuclear industry sources that —civilian nuclear programs are not a proliferation worry because they are an unlikely source of nuclear explosive materials for would-be bomb makers.** They argue that just as current nuclear weapons states relied on dedicated military programs, so would any future would-be weapons country.<sup>4</sup> Our view is different. **Leaving aside the correctness of the assumptions about past weapons programs, the past is not here a good guide to the future because conditions have changed fundamentally. Today all non-weapon states are members of the NPT. If one of these countries should decide to obtain weapons, it would have to withdraw or cheat, both courses risking a military response until the would-be bomb maker had weapons comfortably in hand. This would put a very high premium on traversing the period of vulnerability as quickly as possible.** Henry Kissinger made this point in the previously cited 2006 Trilateral Commission report: —A policy of using preventive force against aspiring nuclear powers, however, creates incentives for them to acquire nuclear weapons as rapidly as possible . . .<sup>5</sup>

**That means drawing on bomb material and knowhow where it is most quickly obtainable, which would mean tapping a nuclear power program if there is one,** unless of course there are strict measures in place to prevent that. If there is any doubt about this conclusion, consider the following counter-historical: **Suppose each of the major WWII belligerents already had civilian nuclear power programs before the war started. Would they not have tapped them rather than started anew to develop independent nuclear weapons programs?** The

answer suggests why strict nonproliferation measures are important.

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The Nuclear Nonproliferation Treaty's Deficiencies In this regard, no one believes that we have adequate preventive anti-proliferation measures in place today. Otherwise we wouldn't be endlessly discussing various international fuel supply schemes to mitigate the risks that national uranium enrichment and fuel reprocessing might be used to produce nuclear explosives. Everyone understands that the NPT as it has been interpreted up to now has basic deficiencies: The treaty allows withdrawal on three months' notice. It does not delineate the limits on permissible —peaceful technology, with respect to fuels that are immediately usable to make nuclear explosives. It sharply restricts IAEA inspections. <sup>5</sup> See, Nuclear Proliferation: Risk and Responsibility. <sup>6</sup> The treaty lacks an established enforcement system, so that each violation requires an improvised response. The treaty's universality is undermined by India, Israel, North Korea, and Pakistan, which remain as examples of what a country can get away with. The advance of technology since the treaty went into force has exacerbated these problems by lowering the technological barriers between civilian nuclear activities and nuclear weapons. The prime example is the spread of centrifuge enrichment technology, which can be used to produce low enriched uranium to fuel power reactors but also can bring states within weeks of acquiring weapons-grade uranium to make a bomb. More generally, worldwide advances in materials and manufacturing and computing skills put weapons design and manufacture within reach of a larger group of countries. Nuclear Power Expansion Remains Goal of Major Nuclear Suppliers and of the IAEA Despite these acknowledged basic inadequacies of current anti-proliferation protections, the U.S. government has supported worldwide use of nuclear power since President Eisenhower's Atoms for Peace Program and continues to do so today. The rationale, however, has evolved. In proposing the program, Eisenhower said that starting with small projects had —the great virtue that it can be undertaken without irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of world-wide inspection and control.<sup>6</sup> In time, however, the projects got bigger and much more significant from the point of view of international security. Meanwhile, the effectiveness of the IAEA inspection system did not keep up. This arguably mattered less when the two Cold War camps expected to keep their client states in line mainly through their own intelligence and intervention. But now we really do need the —completely acceptable system of worldwide inspection and control that President Eisenhower spoke about, especially if there is to be a major expansion in use of nuclear power plants. At the moment, a major, global nuclear expansion is not in play, mainly because of unfavorable economics and, since the March 11, 2011 Fukushima accident, also because of increased safety concerns. <sup>7</sup> Nevertheless, such expansion remains the goal, or at least the expectation, of key nuclear exporters—the United States included—and of the IAEA in Vienna. President Obama has consistently supported an expanded role for nuclear power both abroad and at home. In a March 2012 speech at Hankuk University in South Korea, almost exactly a year after Fukushima, the president said the world needed nuclear power.<sup>8</sup> He predicted that —nuclear energy will only become more important,<sup>9</sup> and that remains the operational assumption in the U.S. government. <sup>9</sup> The IAEA also announced optimism about nuclear power expansion post-Fukushima. At the 2012 IAEA General Conference, Director General Amano said he expected a steady rise in the number of nuclear power plants in the world in the next 20 years.<sup>10</sup> His low case for 2030 projected a nuclear power capacity increase of about a quarter, and his high case projected a doubling of current capacity. <sup>10</sup> The projections are significant as expressions of the Agency's sentiments and those of the national nuclear bureaucracies it represents. However unrealistic, these projections find their way into official and semiofficial nuclear establishment reports and bolster support for nuclear power. Security implications of the Climate Argument for Nuclear Power

<<LINE BREAKS CONTINUE>>

In his January 28, 2013 Inaugural address, **President Obama reiterated his support for building —a new generation of safe, clean nuclear power plants in this country.**<sup>11</sup> In this he is following in his predecessors' footsteps.<sup>11</sup> But his rationale—**that nuclear power is necessary to deal with climate change**—is significantly different, and it has far-reaching security implications.

Since we are talking about a global rather than a local effect, **the climate benefit of nuclear power installations only accrues if there are very many of them.** In resting the case for nuclear power on the need for them to deal with global warming,



the proponents are therefore saying that we must build a very large number of nuclear plants. **The experts say it would take well over 1,000 plants just to make a dent on the climate problem.**<sup>12</sup> **But an increase of that size would likely involve nuclear power programs in dozens more countries, including many in the rougher parts of the world**—most of the Middle Eastern countries have already expressed interest in building nuclear plants—a worrisome prospect from a security point of view.

**It spreads material, knowledge, and 3<sup>rd</sup> party markets.**

**Fuhrmann '9** [Matthew; Professor of Political Science @ Texas A&M University, Former Associate Professor @ Stanford University's Center for International Security & Cooperation, Stanton Nuclear Security Fellow @ the Council on Foreign Relations, Pre-Doctoral Research Fellow @ Harvard University's Belfer Center for Science & International Affairs, Andrew Carnegie Fellow; Summer; JSTOR; "Spreading Temptation: Proliferation and Peaceful Nuclear Cooperation Agreements,"

<https://www.jstor.org/stable/pdf/40389184.pdf>; DOA: 3-22-2025; brackets and ellipses in original]

tristan

This article argues that the conventional wisdom is wrong and dangerous. **All types of civilian nuclear assistance raise the risks of proliferation.** **Peaceful nuclear cooperation and proliferation are causally connected because of the dual-use nature of nuclear technology and know-how.**<sup>7</sup> Civilian cooperation provides technology and materials necessary for a nuclear weapons program and helps to establish expertise in matters relevant to building the bomb. I develop four hypotheses based on this general insight. **First, receiving civilian nuclear assistance over time increases the likelihood that states will begin nuclear weapons programs because it reduces the expected costs of such a campaign and inspires greater confidence among leaders that the bomb could be successfully developed.** Second, militarized disputes with other countries condition the effect of civilian nuclear assistance on program initiation. The likelihood that nuclear assistance causes countries to begin weapons programs increases as their security environments worsen. Third, peaceful aid increases the probability that countries will successfully build nuclear weapons. Fourth, this is especially true when a country's security environment deteriorates.

To test these hypotheses, I produced a data set on civilian nuclear assistance based on the coding of all NCAs signed from 1945 to 2000.<sup>8</sup> A combination of qualitative and quantitative analysis yields support for my arguments, even when controlling for the other variables thought to influence proliferation. The results from my statistical analysis indicate that other factors, such as industrial capacity and membership in the nuclear Nonproliferation Treaty (NPT), also have significant effects on proliferation. But peaceful cooperation is among the few variables that is consistently salient in explaining both nuclear weapons program onset and weapons acquisition.

The conclusions reached in this article should raise concern among policymakers in the United States and abroad. For more than fifty years, the international community has behaved as though peaceful atomic assistance could serve as an effective arms control policy. The United Nations established the International Atomic Energy Agency (IAEA) in 1957 to help bring nuclear energy to countries around the world and establish a system of safeguards to ensure that countries did not use peaceful assistance for military purposes.<sup>9</sup> A decade later, Eisenhower's notion of "atoms for peace" was codified in the NPT, which obligates signatories to forgo nuclear weapons in exchange for access to nuclear technology for peaceful purposes. The findings in this article reveal that efforts to promote the spread of nuclear technology for peaceful use have largely backfired. Given that a nuclear energy renaissance looms on the horizon, the United States and other supplier countries should reevaluate their export practices.

**Previous research has noted that illicit proliferation networks operated by "rogue" states can contribute to nuclear proliferation.**<sup>10</sup> Most infamously, the Pakistan-based Abdul Qadeer (A.Q.) **Khan network served as a "Wal-Mart for proliferators," selling weapons-relevant technology to Iran, North Korea, and Pakistan, and possibly other countries.**<sup>11</sup> **This article does not dispute that illicit commercial activities conducted by second-tier suppliers can facilitate the spread of nuclear weapons.** Rather, it demonstrates that legal nuclear

commerce conducted under the auspices of the NPT can also have damaging effects for national and international security.

The next section offers an overview of the existing research on the causes of nuclear proliferation. In subsequent sections, I lay out my hypotheses linking peaceful nuclear cooperation and proliferation. I then draw from several cases to illustrate the plausibility of my argument and describe how civilian nuclear cooperation can contribute to the spread of nuclear weapons. Next I describe the statistical tests used to evaluate the hypotheses and discuss the results. I conclude by summarizing the article's findings, underscoring the contributions of this study, and offering directions for future research.

Why Do States Pursue Nuclear Weapons?

There is a rich literature on why states pursue nuclear weapons. In recent years this scholarship has turned its attention toward factors influencing a country's demand for nuclear weapons and has treated technological considerations as a secondary concern. For example, Scott Sagan argues that scholars and practitioners should focus on "addressing the sources of the political demand for nuclear weapons, rather than



focusing primarily on efforts to safeguard existing stockpiles of nuclear materials and to restrict the supply of specific weapons technology from the 'haves' to the 'have-nots.'<sup>12</sup> The extant literature identifies a number of demand-side considerations that are salient in explaining nuclear proliferation, including: a state's security environment, international norms, domestic politics, and intangible or symbolic motivations.<sup>13</sup> These studies are often dismissive of supply-side approaches because several countries most notably Germany and Japan have the technical capacity to build nuclear bombs but have chosen not to do so. This critique fails to consider, however, that technology-based arguments are probabilistic, not deterministic.<sup>14</sup>

Recent research focuses on the supply side of nuclear proliferation. This author has examined why states transfer dual-use technology that could be employed to build weapons of mass destruction and why countries export nuclear technology, materials, and know-how for peaceful purposes.<sup>15</sup> Matthew Kroenig has analyzed reasons why states provide "sensitive" nuclear assistance to help other countries to build nuclear weapons.<sup>16</sup> Other quantitative studies examine the links between technical capacity and the spread of nuclear weapons.<sup>17</sup> These studies have found that indicators of economic capacity, such as a state's gross domestic product (GDP) and the nuclear-related resources it possesses, are correlated with weapons proliferation. Despite its many contributions, this work has not adequately addressed the links between civilian nuclear cooperation and weapons proliferation. In particular, it fails to sufficiently test the argument that the diffusion of knowledge and technology makes proliferation more likely. Dong-Joon Jo and Erik Gartzke include a variable in their model measuring the natural log of the number of years between 1938 and time  $t$ , which allows the authors to test the systemic effects of diffusion, but diffusion does not occur equally across all states.<sup>18</sup> Kroenig examines the relationship between nuclear assistance and proliferation more directly, although he does not explore how peaceful aid can encourage countries to pursue nuclear weapons.<sup>19</sup> He also does not examine how strategic factors such as militarized interstate disputes could interact with nuclear assistance. Kroenig argues that only certain sensitive nuclear assistance helps countries acquire the bomb.<sup>20</sup> This type of aid makes up a mere fraction of all nuclear assistance, however. Of the more than 2,000 bilateral civilian nuclear cooperation agreements signed from 1945 to 2000, only 14 (less than 0.7 percent) meet Kroenig's definition of sensitive assistance. I argue that the relationship between nuclear aid and atomic weapons is much broader. All forms of atomic assistance whether it involves training scientists, supplying reactors, or building fuel fabrication facilities raise the likelihood that nuclear weapons will spread.

#### Civilian Nuclear Cooperation and the Bomb

Decades ago scholars offered a "technological momentum" hypothesis, suggesting that countries are more likely to pursue nuclear weapons once they obtain civilian nuclear technology and expertise.<sup>21</sup> The logic driving this hypothesis is that the accumulation of nuclear technology and knowledge leads to incremental advances in the field of nuclear engineering that ultimately makes progress toward developing a nuclear weapons capability before a formal decision to build the bomb is made.<sup>22</sup> John Holdren illustrates this argument well when he states that the proliferation of nuclear power represents the spread of an "attractive nuisance."<sup>23</sup> This logic highlights the relationship between the peaceful and military uses of the atom, but it underplays the political dimensions of proliferation.<sup>24</sup>

Peaceful nuclear cooperation and nuclear weapons are related in two key respects. First, all technology and materials linked to a nuclear weapons program have legitimate civilian applications. For example, uranium enrichment and plutonium reprocessing facilities have dual uses because they can produce fuel for power reactors or fissile material for nuclear weapons.

**Second, civilian nuclear cooperation increases knowledge in nuclear-related matters. This knowledge can then be applied to weapons-related endeavors. Civilian nuclear programs necessitate familiarity with the handling of**

**radioactive materials, processes for fuel fabrication and materials** having chemical or nuclear properties, and the operation and function of reactors and electronic control systems. They also provide experience in other crucial fields, such as metallurgy and neutronics.<sup>25</sup> These experiences offer "a technology base upon which a nuclear weapon program could draw."<sup>26</sup>

**These linkages suggest that peaceful nuclear assistance reduces the expected costs of a weapons program, making it more likely that a decision to begin such a program will be made.**

Considerable political and economic costs such as international sanctions, diplomatic isolation, and strained relationships with allies can accompany nuclear weapons programs.<sup>27</sup> **Leaders may be reluctant to take on these burdens unless they believe that a weapons**

**campaign could succeed relatively quickly. As Stephen Meyer argues, "When the financial and resource demands of [beginning a weapons program] become less burdensome, states might opt to proceed . . .**

**under a balance of incentives and disincentives that traditionally might have been perceived as insufficient for a proliferation decision."**<sup>29</sup> Sometimes, nuclear assistance can cause leaders to initiate nuclear weapons programs in the absence of a compelling security threat. This usually happens when scientists and other members of atomic energy commissions convince the political leadership that producing a nuclear weapon is technologically possible and can be done with relatively limited costs.<sup>30</sup> Scientists do not always push leaders down the nuclear path, but in many cases they do.<sup>31</sup> **Leaders are persuaded by this lobbying because they are keenly aware that the**

**quicker the bomb can be developed, the less likely other national priorities will suffer.**

Although nuclear assistance occasionally produces bomb programs in the absence of a security threat, the relationship between such assistance and proliferation is usually more nuanced. Countries that have received considerable assistance are especially likely to initiate bomb programs when threats arise because they have greater demand for the strategic advantages that nuclear weapons offer.<sup>32</sup> In other words, peaceful nuclear assistance typically conditions the effect that a security environment has on a state's political decision to begin a weapons program. A state that suffers a defeat in war or feels threatened for another reason is unlikely to initiate a program if it lacks a developed civilian nuclear program.

**Without the technical base in place, it is too costly to venture down the weapons path. This explains, in part, why Saudi Arabia has yet to begin a nuclear weapons program even though it faces**

**considerable security threats**.<sup>33</sup> Likewise, countries are unlikely to nuclearize even if they have accumulated significant amounts of assistance if they do not face security threats. On the other hand, initiation of a weapons program is more likely in states that operate in dangerous security environments and possess peaceful nuclear facilities and a cadre of trained scientists and technicians.

### **Safeguards are off.**

**Gilinsky '20** [Victor Gilinsky; Former commissioner of the Nuclear Regulation Commission; Henry Sokolski; Executive Director of NPEC; 02-25-2014; "'Bad Business: Pushing US Nuclear Exports,' The American Interest – NPEC"; Nonproliferation Policy Education Center; <https://npolicy.org/bad-business-pushing-us-nuclear-exports-the-american-interest/>; accessed 03-23-2025] //dg

But the **nuclear enthusiasts say that's too strict, that others have more accommodating terms, and that if we sell with looser terms, we'll have more influence. They have their eye especially on Saudi Arabia**, a country that at one point said, implausibly, it was going to build 16 nuclear power plants. **They don't seem to pay attention to the other thing the Saudis said—the crown prince's statement that if Iran was going to get a bomb, he was going to get one, too, and fast.**

**It's not just the Trump crowd that opposes tightening security rules over nuclear exports** (in the name, they say, of security). President Obama's Energy Secretary, Ernest Moniz, has been arguing that subsidizing domestic nuclear power and encouraging nuclear sales without especially tight security restrictions—restrictions that go by the rubric of "gold standard"—are in the interests of U.S. nuclear security, and even support the deterrence value of our nuclear weapons.

**All this is a bit much. Do we really think that Russia, with a GNP below that of Italy, is capable of freezing us out of the world? Does it have the financial capacity** to offer generous terms on many projects? Will they ever be completed?

**Nuclear power is just one U.S. export technology** and not exactly the most promising. For example, the U.S. exported \$136 billion in aircraft last year; U.S. nuclear exports for the same period could only be measured in millions of dollars. **China is building a comparatively large number of nuclear plants but nuclear power supplies less than five percent of its electrical demand** and is only projected to account for seven percent by 2040. **Any large accident will turn this program off.**

### **Detection is impossible.**

**Lyman '11** [Dr. Edwin; Senior Scientist @ Global Security Program, Member of the Union of Concerned Scientists; July 14; UCSUSA; "An examination of the safety and economics of light water small modular reactors," <https://babel.hathitrust.org/cgi/pt?id=umn.31951d035862139>; DOA: 3-23-2025] tristan

**The distributed deployment of small reactors would also put great strains on existing licensing and inspection resources.** Nuclear reactors are qualitatively different from other types of generating facilities, not least because they require a much more extensive safety and security inspection regime. Similarly, deployment of individual small reactors at widely distributed and remote sites around the world would strain the resources of the International Atomic Energy Agency (IAEA) and its ability to adequately safeguard reactors to guard against proliferation, **since IAEA inspectors would need to visit many more locations per installed megawatt around the world. Maintaining robust oversight over vast networks of SMRs around the world would be difficult, if feasible at all.**

### **Countries immediately react.**

**Schaer '24** [Cathrin Schaer; freelance journalist and editor with primarily DW News; 05-28-2024; "Could a US-Saudi nuclear deal spark Middle East arms race? – DW – 05/28/2024"; DW News; <https://www.dw.com/en/how-us-saudi-mega-deal-could-spark-nuclear-arms-race-in-middle-east/a-69206058>; accessed 03-23-2025] //dg

**Besides fears that the Saudis might end up with nuclear bombs, there are also concerns that simply permitting them to enrich uranium would set off a regional race.**

"Allowing Saudi Arabia to acquire **such capabilities could set a problematic precedent at the international level.** It could possibly encourage other countries in the region, such as **Egypt or Turkey, to pursue similar nuclear capabilities, leading to a proliferation cascade in an already volatile Middle East.**" Manuel Herrera, a researcher focused on nuclear non-proliferation at Istituto Affari Internazionali, an Italian thinktank, wrote late last year.

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Herrera and other experts hope that if a Saudi civilian nuclear program happens, the US government will enforce strict guardrails. These might include deferring uranium enrichment inside Saudi Arabia until later or setting up an enrichment facility that only American citizens can access. It could also include allowing a Saudi-based conversion plant to turn refined uranium powder into gas, but not enriching uranium. The Saudis could also be asked to adhere to conditions, including signing on to specific non-proliferation criteria under Section 123 of the US 1954 Atomic Energy Act and agreeing to additional inspections by the Austria-based International Atomic Energy Agency. "As far as we know, the US is trying to put forward a deal very similar to the one that they did with the United Arab Emirates in 2009, in which they applied Section 123," Herrera explained to DW in an interview earlier this week. However, the Saudis have previously said no to that. The United Arab Emirates became the first Arab state to operate a nuclear reactor in 2021 and is now planning its second. Image: Yonhap/picture alliance What does Israel have to do with it now? "The assumption has been that the various elements [of a US-Saudi agreement] would be mutually reinforcing," Robert Einhorn, a senior fellow at the Washington-based Brookings Institute, wrote in an April briefing. "For example, normalization would make nuclear cooperation with [Saudi Arabia] more palatable to Israel, and a US security guarantee and nuclear cooperation would make normalization more palatable to [Saudi Arabia]." But now that Israel is not involved, analysts say the "mega deal" may be another way to pressure the Israeli government. Israel's allies, including the US, have been pushing Israeli leaders towards a different, more careful approach in Gaza. The Israeli government has previously said it doesn't want the Saudis to get any kind of uranium enrichment capacities. US outbidding China? However, there are also other equally significant motives for US-Saudi nuclear cooperation. As Davenport of the Arms Control Association pointed out, Saudi Arabia's interest in nuclear energy predates the "push for a broader Israeli-Saudi normalization." "And there are also some other countries who have been putting offers on the table," Herrera told DW, referring to China. If a US-Saudi nuclear deal goes ahead, this would sideline any Chinese influence in this area. From a commercial perspective, it would also result in healthy contracts for US companies. The recent progress on a US-Saudi deal also has a lot to do with upcoming US elections, Davenport argued. "The Biden administration wants an agreement before the presidential election." Other experts have suggested that closer cooperation between Saudi Arabia and the US may also mean the Americans have more influence over Saudi Arabian decisions on oil prices. The US government would obviously prefer these to stay lower in the run-up to elections. But could a deal still end up causing a nuclear race of some kind in the Middle East?

<<LINE BREAKS CONTINUE>>

**"There is a risk ... if you give one actor access to this technology, then the race will be on,"** Herrera agreed. But he thinks that, with sufficient guardrails and monitoring in place, risks could be minimized.

## **Preemptive strikes ensue.**

**Cimbala '23** [Stephen J. Cimbala; Distinguished Professor of Political Science, Penn State Brandywine, an American Studies faculty member; Adam B. Lowther; Research Professor at the Air Force Research Institute, 06-28-2023; "Nuclear Danger in Asia: Arms Races or Stability?"; Politics Between Nations; pp 263–280; Springer; access at <https://drive.google.com/file/d/14S6vNFrtea17NeUY9GUFDVUA-qmfm499/view?usp=sharing>; accessed 11-03-2024] leon

**The spread of nuclear weapons in Asia poses two kinds of threats to international peace and security. The first is that of a deliberate decision taken for nuclear first strike, either in mistaken fear of imminent attack, or as a preventive war to disable a rising and presumably threatening opponent. The second nuclear danger in Asia is that of inadvertent escalation growing out of a conventional war, and related to this, the possibility of accidental or inadvertent use of nuclear forces due to military usurpation of civil authority or technical malfunction.** <sup>20</sup> However, there is no reliable metric for relating the numbers of nuclear weapons states to the probability of nuclear first use. States' internal decision-making processes will drive these decisions, for better or worse. Although the international system imposes certain

constraints on the behaviors of current and aspiring nuclear weapons states, **the system is also the derivative of their respective national priorities and threat perceptions.**

## 1NC---DA---Russia

**Russia's economy is on the brink---oil is Putin's lifeline.**

**Matthews '25** [Owen Matthews, Degree in Modern History at Oxford University, 3-13-2025, **The Russian economy is on the brink of collapse** and Putin knows it, The Independent, <https://www.the-independent.com/news/world/europe/russia-economy-putin-ukraine-war-deal-talks-trump-b2714371.html>, accessed 03-28-2025] leon

How close is Russia's economy to collapse? As Donald Trump's negotiators open direct talks with the Kremlin, Kyiv's European allies hope that a final push on sanctions against Russia could be Ukraine's last – and best – hope of victory. Mr Trump has warned that the US could impose a “devastating” financial blow on Russia if Putin refuses to accept the ceasefire agreement. “There are things you can do that wouldn't be pleasant in a financial sense. I can do things financially,” he said in the Oval Office.

Putin intended his full-scale invasion of Ukraine to be a three-day operation that would force regime change in Kyiv. Neither Putin nor his military or economic planners anticipated a grinding war that now soaks up over 40 per cent of Kremlin spending.

Nor did they expect Europe to impose serious sanctions, and even less did they anticipate the destruction of three of the four Gazprom gas pipelines under the Baltic Sea that before the war supplied over 30 per cent of Europe's gas.

The result in Russia has been **rampant inflation**, currently running at **over 9 per cent**, crippling **interest rates of 21 per cent and** runaway price hikes on staple goods that far **outpace the headline inflation rate** and have hit ordinary Russians hard.

Last summer the price of eggs jumped by 42 per cent, bananas by 48 per cent, tomatoes by 39.5 per cent and potatoes by 25 per cent. **The Russian ruble** has **lost over half of its value** since Putin first invaded Crimea in 2014, and over \$600bn of the Kremlin's foreign currency reserves have been frozen in Western banks.

More than 1,000 Western businesses – including Ikea and McDonald's – pulled out, as did Western car manufacturers. Imports of Western goods – especially technology – are now expensively routed through sanctions-busting neighbours like Kazakhstan and Georgia. And last month Russian utility companies hiked prices for electricity by up to 250 per cent.

“Everyone drives Chinese cars these days, but there are no spare parts,” says Alexandra, 39, a former journalist who lives in Moscow and whose ex-husband is fighting in Ukraine. “The only foreign cars you buy are right-hand-drive [from Japan]. Anyone with a mortgage is paying crazy interest. People complain how expensive everything has become.”

Russia spent more on its military in 2024 than the rest of Europe combined, according to the International Institute for Strategic Studies' latest Military Balance report – a staggering \$462bn, if adjusted for purchasing power. The Kremlin's spending splurge on its war effort has produced some winners, notably the 1.5 million troops currently serving in Putin's army who are paid up to \$2,500 a month to fight – four times the average salary in Russia's most impoverished provinces.

Massive losses on the battlefield have worsened labour shortages, with a record-low unemployment rate of 2.4 per cent. Factories are running at capacity and beyond. Russia's economy has “reached the limits of its productive capacity while demand continues to be stimulated,” Central Bank chief Elvira Nabiullina warned the Russian parliament in November, predicting a fatal combination of economic stagnation and inflation known as “stagflation”.

For the first three years of the war, the Kremlin's war spending fuelled GDP growth which peaked at a staggering 5.4 per cent in early 2024. But 2025 will be the year that growth flatlines, experts predict.

The Kremlin has been able to afford its spending spree thanks, mostly, to India and China, which have continued to import Russian oil in record quantities. The EU has in theory capped the price that customers can pay for Russian Urals crude at \$60 a barrel – somewhat below the current

market price of \$67. But so-called “attestation fraud” – such as making up the difference in fake transportation and other costs – makes the rules easy to bend.

Natural gas has never been sanctioned by the EU at all – and until 1 January of this year, 13 per cent of Europe’s piped gas was still being shipped from Russia through Ukrainian pipelines to Slovakia and Hungary.

Ukrainian fire and fury are currently doing damage to Russia’s war economy that near-nonexistent European sanctions have failed to achieve

Southern Europe continues to import millions of cubic meters of Russian gas via Turkey. And despite its posturing, Europe still sources more than 15 per cent of its liquefied natural gas or LNG from Russia – with some 17.8m tonnes of LNG docking in European ports in 2024, up by more than 2 million tonnes from the year before, according to analysts Rystad Energy.

In fact the only really effective “sanctions” on the Russian energy sector – which accounts for over two-thirds of government revenues – have been in the form of Ukrainian drone attacks on Russian oil refineries, pumping stations and storage facilities. Ukrainian fire and fury are currently doing damage to Russia’s war economy that European “sanctions” have failed to achieve.

International pressure has made it harder, but not impossible, for the Russian war machine to obtain important components such as semiconductors. And sanctions have certainly “achieved the crucial goal of leaving Russia’s economy highly unstable in the medium to long term”, according to Oliver Ruth of London’s Royal United Services Institute.

The current crazy levels of expenditure are unsustainable, so Putin has a strong economic incentive to bring his war to an end. Ukraine’s economy is also under attack.

But on the flip side, even as Russia’s economy slips into stagflation Ukraine’s economy is doing far worse. Concerted Russian assaults, damage to vital energy infrastructure and mass emigration have inflicted catastrophic damage of up to 40 per cent of the country’s pre-war GDP. Kyiv’s budget payments to millions of soldiers and state employees are currently being paid by the EU. Without those subsidies – the lion’s share of the €60bn in direct financial support so far sent by Brussels – Ukraine’s government finances would instantly collapse.

Ukraine’s European allies hoped that sanctions would force Putin into taking an early off ramp and bring his economy crashing down. That hasn’t yet happened yet – largely because Europe has been unable to kick its addiction to Russian gas, and the US did not want to risk a global oil price spike by cutting off Russian exports.

**Affirming collapses state stability.**

**Proedrou ’23** [Filippos; Senior Lecturer in Global Political Economy @ the University of South Wales, PhD in IR from the University of Thrace; November 10; Elgar; “Chapter 27: The global energy transition and Russian structural power: scenarios and strategic options,”

<https://www.elgaronline.com/edcollchap/book/9781800370432/book-part-9781800370432-35.xml>;  
accessed 03-21-2025] tristan

Lower fossil-induced profits will test the current rent-based social contract (Scholten et al., 2019, p. 190). Shrinking budget revenues will decelerate the country’s fiscal capacity to maintain the wealth and the welfare level of the Russian population (Henderson & Mitrova, 2020, p. 110). The ensuing likely removal of gas subsidies and cuts to healthcare, education and social services have the potential to destabilize the regime. This will be so especially in the resource-producing regions, which are going to be hit the hardest by the progressive divestment from the fossil industry. One could counterargue that Russia retains strong fiscal capacity and has managed to successfully support its budget in cases of low oil prices. Hence, one should not anticipate such drastic deterioration of the social contract in Russia. Nevertheless, and while Russia will manage to offset some of these repercussions at least for some time, the pace and scale of the revenue decrease caused by the global energy transition is expected to be very severe. More importantly, unlike the case of low oil prices that at some point rebound in normal boom-and-bust cycles, the trend of the global energy transition will be exactly towards lower oil and gas quantities exported and lower prices (Coffin et al., 2021), thus bringing the Russian economy to its knees. Such developments are likely to increase the infighting between the Russian elites as

the **consolidated power** of incumbents **weakens**, thus **opening up a window of opportunity** for **contenders** (Øverland, 2021). This, at the same time, **can intensify** (a sense of) **non-governability and instability**, and precipitate/**invite insurrections and separatist movements**, as separatist **factions** may **perceive Russian impoverishment** and **economic hardship** as the **opening of a grand opportunity** for achieving **longstanding political goals**. The precedent of Chechnya in an impoverished and largely unproductive Russia in the 1990s (Aliyev, 2013) may offer insight into the likely internal political problems Russia may face once the global energy transition dilutes a substantial chunk of Russia's budget and spending capacity. **Regional nationalism** in, among others, **Tatarstan, Bashkortostan, the Urals and the Far East** (exposing the populations to Chinese influence and encroachment) **renders secessionist tendencies a real danger to Russia** integrity. The shifting of budgetary priorities to meet the war economy goals, in conjunction with anticipated progressively **lower energy-borne revenues**, resistance to mobilization of the part of the population for war needs and frustration with the war **constitute** a context more conducive to **political turmoil, resistance and pressures to the regime** (Lieven, 2022).

### **Perception triggers financial shocks.**

**Baltviks '22** [Witajewski; Expert @ the Centre for Climate and Energy Analyses @ the Polish National Centre for Emission Management; April 26; euractiv; "How the green paradox and climate policy can become Putin's nightmare,"

<https://www.euractiv.com/section/energy/opinion/how-the-green-paradox-and-climate-policy-can-become-putins-nightmare/>; accessed 03-21-2025] tristan

The ability of climate policy to influence the oil market and oil prices is illustrated in the so-called green paradox. The green paradox is a hypothetical scenario in which **the announcement of a rigid climate policy** becomes a **signal for oil producers** that **the demand for oil will end** soon, **motivating them to sell as much as they can** as soon as they can.

**Flooding the market** with oil **depresses its price** and **incentivises consumers to use more**. If this were to happen, **emissions** would **increase, rendering the climate policy ineffective**. The green paradox is particularly relevant in the context of oil markets, but **the mechanisms of the paradox can also apply to natural gas and coal**. Until recently, the green paradox was a problem for climate change economists, but the one who should be most concerned is, in fact, Vladimir Putin. **The green paradox has the potential to turn radical climate policy into a weapon against Putin's regime**. It is especially important because **Russia**, the second-largest worldwide gas producer and the third-largest oil producer, **currently uses fossil fuels as a weapon against the West** for the purpose of pacification.

**A clear and credible commitment** by the largest economies in the world to halve the consumption of oil over the next two decades **would be a clear signal to all oil producers that their resources will soon lose value. No producer** with low extraction costs **will keep its reserves for the future – they will attempt to pump their oil into the market as long as it exists.**

**Low-cost oil** from Saudi Arabia and the **United Arab Emirates will**, at least partly, **crowd out** the more **expensive product from Russia**, Venezuela and Iran. Even if that crowding out is not complete, the **low oil price will render these countries' oil revenues negligible. In Russia, where oil rents constitute more than 9% of the nation's GDP (36% of public-sector revenue), this will** unavoidably **complicate the financial landscape** of the regime.

### **Nuclear is unique.**

**Adams '13** [Rod Adams; Reporter for the American Nuclear Society; 12-10-2013; "Do oil and gas suppliers worry about nuclear energy development?"; Nuclear Newswire;

<https://www.ans.org/news/article-1481/do-oil-and-gas-suppliers-worry-about-nuclear/>; accessed 03-04-2025] leon

That is the most important take away for attendees at the OPEC Embargo +40 summit held in Washington DC on October 16. Unfortunately, the meeting sponsors avoided acknowledging that **nuclear energy is the alternative energy source that most worries**



established hydrocarbon suppliers. Nuclear has held that position since the early 1960s, when General Electric first won a head-to-head competition against coal to sell the Oyster Creek nuclear power plant.

Nuclear energy is reliable, virtually emission-free, and uses a widely distributed, abundant fuel source that is no longer subject to influence by the same producers that manipulate other fuel prices. Its cheap, clean heat can help turn coal, natural gas, and plants (vegetation) into liquid fuels that can be drop-in replacements for petroleum-based fuels.

### **Decline causes great power war.**

**Kaplan '16** [Robert D. Kaplan; American author, Senior fellow at the Center for a New American Security; March/April 2016; "Eurasia's Coming Anarchy"; Foreign Affairs; <https://www.foreignaffairs.com/articles/china/2016-02-15/eurasias-coming-anarchy>; access at <https://archive.ph/YfaTO>; accessed 03-29-2025] doobz

Not coincidentally, these military adventures have accompanied the sharp reversal of Russian economic power. In 2014, the price of oil collapsed, the countries of central and eastern Europe continued to wean themselves off Russian gas, slow global growth further reduced the appetite for Russian hydrocarbons and other natural resources, and the West levied damaging sanctions on Moscow. The result has been a full-blown economic crisis, with the ruble losing roughly half of its value against the U.S. dollar since 2014. That year, Russian GDP growth fell to nearly zero, and by the third quarter of 2015, the economy was shrinking by more than four percent. In the first eight months of 2015, capital investment declined by six percent and the volume of construction fell by eight percent.

Russia's economic problems run deep, leaving its leaders with few easy options for fixing them. For decades, Russia has relied on natural resource production and a manufacturing sector that makes consumer goods for the domestic market (since few foreigners want to buy Russia's nonmilitary products). Despite some pockets of ostentatious wealth, the service sector has remained underdeveloped. Because Putin and his camarilla never built civil institutions or a truly free market, the corrupt, gangster-led economy of Russia today exhibits eerie similarities to the old Soviet one.

Back in the 1980s, when that economy was hit by a crisis, Mikhail Gorbachev responded by opening up the political system—only to be rewarded with anarchy and the collapse of Russia's empire. Putin learned this lesson well and is determined to do the opposite: keep the political system closed while distracting the masses with displays of Russian power in the near abroad. Putin is a former intelligence agent, not a former apparatchik. Thus, although he nurses historical grudges concerning Russia's place in the world, he is not deceiving himself about Russia's internal problems. As the Russian economy decays further, Putin surely knows that for the sake of domestic approval, his foreign policy must become more creative and calculating, even deceptively conciliatory at moments. Over time, expect him to find new ways to undermine NATO and the EU, even as he claims to be helping the West fight the Islamic State, or ISIS. For the more chaos he can generate abroad, the more valuable the autocratic stability he provides at home will appear. Russians may know in the abstract that a freer society is preferable, but they fear the risks of such a transition.

Try as he might, however, Putin will not be able to shelter his regime from the fallout of economic collapse. Desperation will spawn infighting among a ruling elite that has grown used to sharing generous spoils. Given the absence of strong institutions, as well as the brittle and highly centralized nature of the regime, a coup like the one that toppled Nikita Khrushchev in 1964 cannot be ruled out: Russia remains Soviet in its style of governance. The country has experienced the crumbling of autocracy followed by chaos before (as during and after the 1917 revolutions), and it's possible that enough turmoil could cause Russia to fragment yet again. The heavily Muslim North Caucasus, along with areas of Russia's Siberian and Far Eastern districts, distant from the center and burdened by bloody politics, may begin loosening their ties to Moscow in the event of instability inside the Kremlin itself. The result could be Yugoslavia lite: violence and separatism that begin in one place and spread elsewhere. As Moscow loses control, the global jihadist movement could take advantage of the vacuum and come to Russia's outlying regions and to Central Asia.

Bad as this sounds, things could still get worse. Back in 1991, the Polish intellectual Adam Michnik predicted that future leaders in Russia and eastern Europe would fill the gap left by the collapse of communism with "a coarse and primitive nationalism." Putin has adopted just such a nationalism in recent years. He has slyly backed separatist movements in Abkhazia, the Donbas, Nagorno-Karabakh, South Ossetia, and Transnistria, creating deniable conflicts that result in warlord-run statelets. In the

years ahead, he may well choose to provoke more of these so-called frozen conflicts, but this time in NATO Baltic member states (which have sizable Russian populations and which Moscow still considers lost provinces). Meanwhile, Putin will try to play on Europe's need for Russian support in Syria to force Europe to acknowledge his annexation of Crimea and his de facto rule over eastern Ukraine.

## **Extinction!**

**Clare '23** [Stephen Clare; Effective Altruism Writer; June 2023; "Great power war"; 80000 Hours; <https://80000hours.org/problem-profiles/great-power-conflict/>; accessed 12-05-2024] leon

A modern great power war could see nuclear weapons, bioweapons, autonomous weapons, and other destructive new technologies deployed on an unprecedented scale.

It would probably be the most destructive event in history, shattering our world. It could even threaten us with extinction.

<<TEXT CONDENSED NONE OMITTED>>

We've come perilously close to just this kind of catastrophe before. On October 27, 1962 — near the peak of the Cuban Missile Crisis — an American U-2 reconnaissance plane set out on a routine mission to the Arctic to collect data on Soviet nuclear tests. But, while flying near the North Pole, with the stars obscured by the northern lights, the pilot made a navigation error and strayed into Soviet airspace.<sup>1</sup> Soviet commanders sent fighter jets to intercept the American plane. The jets were picked up by American radar operators and nuclear-armed F-102 fighters took off to protect the U-2. Fortunately, the reconnaissance pilot realised his error with enough time to correct course before the Soviet and American fighters met. But the intrusion enraged Soviet Premier Nikita Khrushchev, who was already on high alert amidst the crisis in Cuba. "What is this, a provocation?" Khrushchev wrote to US President John F. Kennedy. "One of your planes violates our frontier during this anxious time when everything has been put into combat readiness." If the U-2's path had strayed further west, or the Soviet fighters had been fast enough to intercept it, this incident could have played out quite differently. Both the United States and the USSR had thousands of nuclear missiles ready to fire. Instead of a nearly-forgotten anecdote, the U-2 incident could have been a trigger for war, like the assassination of Franz Ferdinand.

<<LINE BREAKS CONTINUE>>

Competition among the world's most powerful countries shapes our world today. And whether it's through future incidents like the lost U-2, or something else entirely, it's plausible that it could escalate and lead to a major, devastating war.

Is there anything you can do to help avoid such a terrible outcome? It is, of course, difficult to imagine how any one individual can hope to influence such world-historical events. Even the most powerful world leaders often fail to predict the global consequences of their decisions.

But I think the likelihood and severity of great power war makes this among the most pressing problems of our time — and that some solutions could be impactful enough that working on them may be one of the highest-impact things to do with your career.

By taking action, I think we can create a future where the threat of great power war is a distant memory rather than an ever-present danger.

Summary

Economic growth and technological progress have bolstered the arsenals of the world's most powerful countries. That means the next war between them could be far worse than World War II, the deadliest conflict humanity has yet experienced.

Could such a war actually occur? We can't rule out the possibility. Technical accidents or diplomatic misunderstandings could spark a conflict that quickly escalates. Or international tension could cause leaders to decide they're better off fighting than negotiating.

<<TEXT CONDENSED NONE OMITTED>>

It seems hard to make progress on this problem. It's also less neglected than some of the problems that we think are most pressing. There are certain issues, like making nuclear weapons or military artificial intelligence systems safer, which seem promising — although it may be more impactful to work on reducing risks from AI, bioweapons or nuclear weapons directly. You might also be able to reduce the chances of misunderstandings and miscalculations by developing expertise in one of the most important bilateral relationships (such as that between the United States and China). Finally, by making conflict less likely, reducing competitive pressures on the development of dangerous technology, and improving international cooperation, you might be helping to reduce other risks, like the chance of future pandemics. Our overall view Recommended Working on this issue seems to be among the best ways of improving the long-term future we know of, but all else equal, we think it's less pressing than our highest priority areas (primarily because it seems less neglected and harder to solve). Scale There's a significant chance that a new great power war occurs this century. Although the world's most powerful countries haven't fought directly since World War I, war has been a constant throughout human history. There have been numerous close calls, and several issues could cause diplomatic disputes in the years to come. These considerations, along with forecasts and statistical models, lead me to think there's about a one-in-three chance that a new great power war breaks out in roughly the next 30 years. Few wars cause more than a million casualties and the next great power war would probably be smaller than that. However, there's some chance it could escalate massively. Today the great powers have much larger economies, more powerful weapons, and bigger military budgets than they did in the past. An all-out war could kill far more people than even World War II, the worst war we've yet experienced. Could it become an existentially threatening war — one that could cause human extinction or significantly damage the prospects of the long-term future? It's very difficult to say. But my best current guess is that the chance of an existential catastrophe due to war in the next century is somewhere between 0.05% and 2%. Neglectfulness War is a bit less neglected than some of our other top problems. There are thousands of people in governments, think tanks, and universities already working on this problem. But some solutions or approaches remain neglected. One particularly promising approach is to develop expertise at the intersection of international conflict and another of our top problems. Experts who understand both geopolitical dynamics and risks from advanced artificial intelligence, for example, are sorely needed. Solability Reducing the risk of great power war seems very difficult. But there are specific technical problems that can be solved to make weapons systems safer or less likely to trigger catastrophic outcomes. And in the best case, working on this problem can have a leverage effect, making the development of several dangerous technologies safer by improving international cooperation and making them less likely to be deployed in war. At the end of this profile, I suggest five issues which I'd be particularly excited to see people work on. These are: Developing expertise in the riskiest bilateral relationships Learning how to manage international crises quickly and effectively and ensuring the systems to do so are properly maintained Doing research to improve particularly important foreign policies, like strategies for sanctions and deterrence Improving how nuclear weapons and other weapons of mass destruction are governed at the international level Improving how such weapons are controlled at the national level Profile depth In depth This is one of many profiles we've written to help people find the most pressing problems they can solve with their careers. Learn more about how we compare different problems, see how we try to score them numerically, and see how this problem compares to the others we've considered so far. Why might preventing great power war be an especially pressing problem? A modern great power war — an all-out conflict between the world's most powerful countries — could be the worst thing to ever happen to humanity. Historically, such wars have been exceptionally destructive. Sixty-six million people died in World War I, likely the deadliest catastrophic humanity has experienced so far. Since World War II, the global population and world economy have continued to grow, nuclear weapons have proliferated, and military technology has continued to advance. This means the next world war could be even worse, just as World War II was much deadlier than World War I. It's not guaranteed that such a war will break out. And if it does, it may not escalate to such a terrible extent. But the chance can't be ignored. In fact, there are reasons to think that the odds of World War II breaking out this century are worryingly high. A modern great power war would be devastating for people alive today. But its effects could also persist long into the future. That's because there is a substantial chance that this century proves to be particularly important. Technologies with the potential to cause a global catastrophe or radically reshape society are likely to be invented. How we choose to develop and deploy them could impact huge numbers of our descendants. And these choices would be affected by the outcomes of a major war. To be more specific, there are three main ways great power conflict could affect the long-term future: High international tension could increase other risks. Great power tensions could make the world more dangerous even if they don't lead to war. During the Cold War, for example, the United States and the USSR never came into direct conflict but invested in bioweapons research and built up nuclear arsenals. This dynamic could return, with tension between great powers fueling races to develop and build new weapons, raising the risk of a disaster even before shots are fired. War could cause an existential catastrophe. If war does break out, it could escalate dramatically, with modern weapons (nuclear weapons, bioweapons, autonomous weapons, or other future technologies) deployed at unprecedented scale. The resulting destruction could irreparably damage humanity's prospects. War could reshape international institutions and power balances. While such a catastrophic war is possible, it seems extremely unlikely. But even a less deadly war, such as another conflict on the scale of World War I, could have very long-lasting effects. For example, it could reshape international institutions and the global balance of power. In a pivotal century, different institutional arrangements and geopolitical balances could cause humanity to follow different long-term trajectories. The rest of this profile explores exactly how pressing a problem great power conflict is. In summary: Great power relations have become more tense. (More.) Partly as a result, a war is more likely than you might think. It's reasonable to put the probability of such a conflict in the coming decades somewhere between 10% and 50%. (More.) If war breaks out, it would probably be hard to control escalation. The chance that it would become large enough to be an existential risk cannot be dismissed. (More.) This makes great power war one of the biggest threats our species currently faces. (More.) It seems hard to make progress on solving such a difficult problem (more) — but there are many things you can try if you want to help (more). International tension has risen and makes other problems worse. Imagine we had a thermometer-like device which, instead of measuring temperature, measured the level of international tension.2 This 'tension meter' would max out during periods of all-out global war, like World War II. And it would be relatively low when the great powers3 were peaceful and cooperative. For much of the post-Napoleonic 1800s, for example, the powerful European nations instituted the Concert of Europe and mostly upheld a continental peace. The years following the fall of the USSR also seem like a time of relative calm, when the tension metre would have been quite low.4 How much more worried would you be about the coming decades if you knew the tension metre would be very high than if you knew it would be low? Probably quite a lot. In the worst case, of course, the great powers could make even more long-lasting effects. But even if it doesn't lead to war, a high level of tension between great powers could accelerate the development of new strategic technologies, make it harder to solve global problems like climate change, and undermine international institutions. During the Cold War, for instance, the United States and the Soviet Union came into direct conflict. But the tension metre would still have been pretty high. This led to some dangerous events: A nuclear arms race. The number of nuclear warheads in the world grew from just 300 in 1950 to over 64,000 in 1986. The development of new bioweapons. Despite signing the Biological Weapons Convention in 1972, the search for military advantages motivated Soviet decision makers to continue investing in bioweapon development decades later. Although never used in combat, biological agents were accidentally released from research facilities, resulting in dozens of deaths and threatening to cause a pandemic.5 Nuclear close calls. Military accidents and false alarms happened regularly, and top decision makers were more likely to interpret these events hostily when tensions were high. On several occasions it seems the decision about whether or not to start a nuclear war came down to individuals acting under stress and with limited time. This makes international tension an existential risk factor. It's connected to a number of other problems, which means reducing the level of international tension would lower the total amount of existential risk we face. The level of tension today Recently, international tension seems to have once again been rising. To highlight some of the most salient examples: China-United States relations have deteriorated, leading to harsh diplomatic rhetoric and protectionist trade policies that aim to reduce the countries' economic interdependence. Russia's invasion of Ukraine has killed about a hundred thousand people so far, raised the risk of nuclear war, and sent United States-Russia relations to their lowest point since the Cold War. Chinese and Indian soldiers fought deadly skirmishes along their countries' disputed border in 2020–21. These dynamics raise an important question: how much more dangerous is the world given this higher tension than it would be in a world of low tension? I think the answer is quite a bit more dangerous — for several reasons. First, international tensions seem likely to make technological progress more dangerous. There's a good chance that, in the coming decades, humanity will make some major technological breakthroughs. We've discussed, for example, why one might worry about the effects of advanced artificial intelligence systems or biotechnology. The level of tension could strongly affect how these technologies are developed and governed. Tense relations could, for example, cause countries to neglect safety concerns in order to develop technology faster.6 Second, great power relations will strongly influence how nations do, or do not, cooperate to solve other global collective action problems. For example, in 2022, China withdrew from bilateral negotiations with the United States over climate action in protest of what it perceived as American diplomatic aggression in Taiwan. That same year, efforts to strengthen the Biological Weapons Convention were reportedly hampered by the Russian delegation after their country's invasion of Ukraine raised tensions with the United States and other western countries. And third, if relations deteriorate severely, the great powers could fight a war. How likely is a war? Wars are destructive and risky for all countries involved. Modern weapons, especially nuclear warheads, make starting a great power war today seem like a suicidal undertaking. But factors like the prevalence of war throughout history, the chance that leaders make mistakes, conflicting ideologies, and commitment problems, make me think that conflict could break out anyway. On balance, I think such an event is somewhat unlikely but hardly unthinkable. To quantify this: I put the chance we experience some kind of war between great powers before 2050 at about one-in-three.7 War has occurred regularly in the past. One reason to think a war is quite likely is that such conflicts have been so common in the past. Over the past 500 years, about two great power wars have occurred per century.8 Naively, this would mean that every year there's a 2% chance such a war occurs, implying the chance of experiencing at least one great power war over the next 80 years — roughly until the end of the century — is about 80%.9 This is a very simple model. In reality, the risk is not constant over time and independent across years. But it shows that if past trends simply continue, the outcome is likely to be very bad. Has great power war become less likely? One of the most important criticisms of this model is that it assumes the risk is constant over time. Some researchers have argued instead that, especially since the end of World War I, major conflicts have become much less likely due to: Nuclear deterrence: Nuclear weapons are so powerful and destructive that it's just too costly for nuclear-armed countries to start wars against each other.10 Democratisation: Democracies have almost never gone to war against each other, perhaps because democracies are more interconnected and their leaders are under more public pressure to peacefully resolve disputes with each other.11 The proportion of countries that are democratic has increased from under 10% in 1945 to about 50% today. Strong economic growth and global trade: Global economic growth accelerated following World War II and the value of global exports grew by a factor of almost 10 between 1950 and 2014. Since war disrupts economies and international trade, strong growth raises the costs of fighting.12 The spread of international institutions: Multilateral bodies like the United Nations General Assembly and Security Council promote diplomatic dialogue and facilitate coordination to punish transgressions.13 It is true that we are living through an unusually long period of great power peace. It's been about 80 years since World War II. We just saw that a simple model using the historical frequency of great power wars suggests there was only a 20% chance of going that long without at least one more war breaking out. This one evidence in favour of the idea that we are living through a particularly long period of great power peace. At the same time, we shouldn't feel too optimistic. The numerous close calls during the Cold War suggest we were somewhat lucky to avoid a major war in that time. And a 20% chance of observing 80 years of peace is not that low.14 Structural changes might have dramatically reduced the likelihood of war. Or perhaps we've just been lucky. It could even be that technological advances have made war less likely to break out, but more deadly when it occurs, leaving the overall effect on the level of risk ambiguous. It just hasn't been long enough to support a decisive view.15 So while the recent historical trend is somewhat encouraging, we don't have nearly enough data to be confident that great power war is a thing of the past. To better predict the likelihood of future conflict, we should also consider distinctive features of our modern world.16 One might think that a modern great power war would simply be so destructive that no state leader would ever choose to start one. And some researchers do think that the destruction such a war would wreak globally makes it less likely to occur. But it would be hard to find anyone who claims this dynamic has driven the risk to zero. First, a war could be started by accident. Second, sometimes even prudent leaders may struggle to avoid a slide towards war. We could blunder into war. An accidental war can occur if one side mistakes some event as an aggressive action by an adversary. This happened several times during the Cold War. The earlier example of the wayward American reconnaissance plane shows how routine military exercises carry some escalation risk. Similarly, throughout history, nervous pilots and captains have caused serious incidents by attacking civilian planes and ships.17 Nuclear weapons allow for massive retaliatory strikes to be launched quickly — potentially too quickly to allow for such situations to be explained and de-escalated. It is perhaps more likely, though, that an accidental war could be triggered by a technological malfunction. Faulty computers and satellites have previously triggered nuclear close calls. As monitoring systems have become more reliable, the rate at which such accidents have occurred has been going down. But it would be overconfident to think that technological malfunctions have become impossible. Future technological risks will likely raise new challenges for nuclear weapon control. There may be pressure to integrate artificial intelligence systems into nuclear command and control to allow for faster data processing and decision making. And AI systems are known to behave unexpectedly when deployed in new environments.18 New technologies will also create new accident risks of their own, even if they're not connected to nuclear weapons systems. Although these risks are hard to predict, they seem significant. I'll say more about how such technologies — including AI, nuclear, biological, and autonomous weapons — are likely to increase war risks later. Leaders could choose war. All that said, most wars have not started by accident. If another great power war does break out in the coming decades, it is more likely to be an intentional decision made by a national leader. Explaining why someone might make such a costly, destructive, unpredictable, and risky decision has been called 'the central puzzle about war'. It has motivated researchers to search for 'rationalist' explanations for war. In his 2022 book *Why We Fight*, for example, economist Chris Blattman proposes five basic explanations: unchecked interests, intangible incentives, uncertainty, commitment problems, and misperceptions.19 Blattman's Five (Rationalist) Explanations for War This section discusses how great power tensions may escalate to war in the next few decades. It focuses on three potential conflicts in particular: war between the US and China, between the US and Russia, and between China and India. These are discussed because each of these countries are among the world's largest economies and military spenders, and seem particularly likely to fight. At the end, I briefly touch on other potential large conflicts. Projected real GDP of the US, China, and India according to a 2022 Goldman Sachs analysis Source: Author's figure using data from: Kevin Davidson and Tadas Gediminas, 'Global Economics Paper The Path to 2075 — Slower Global Growth, But Convergence Remains Intact', Global Economics Paper (Goldman Sachs, December 6, 2022). <https://www.goldmansachs.com/intelligence/pages/gp-research/the-path-to-2075-slower-global-growth-but-convergence-remains-intact/report.pdf> The most worrying possibility is war between the United States and China. They are easily the world's largest economies. They spend by far more than their other militaries. Their diplomatic relations are tense and have recently worsened. And their relationship has several of the characteristics that Blattman identifies as causes of war. At the core of the United States-China relationship is a commitment problem. China's economy is growing faster than the United States'. By some metrics, it is already larger.20 If the differential growth continues, the gap will continue to widen between the United States. While economic power is not the sole determinant of military power, it is a key factor.21 The United States and China may be able to strike a fair deal today. But as China continues to grow faster, that deal may come to seem unbalanced. Historically, such commitment problems seem to have conflicted over the course of kind of transition periods particularly dangerous.22 In practice, the United States and China may find it hard to agree on rules to guide their interactions, such as how to run international institutions or govern areas of the world where their interests overlap. The most obvious issue which could tip the United States-China relationship from tension into war is a conflict over Taiwan. Taiwan's location and technology industries are valuable to both great powers. This issue is further complicated by intangible incentives. For the United States, it is also a conflict over democratic ideals and the United States' reputation for defending its allies. For China, it is also a conflict about territorial integrity and addressing what are seen as past injustices. Still, forecasts suggest that while a conflict is certainly possible, it is far from inevitable. As of 8 June 2023, one aggregated forecast23 gives a 17% chance of a United States-China war breaking out before 2035.24 A related aggregated forecast of the chance that at least 100 deaths occur in conflict between China and Taiwan by 2050 gives it, as of 8 June 2023, a much higher 68% chance of occurring.25 United States-Russia Russia is the United States' other major geopolitical rival. Unlike China, Russia is not a rival in economic terms: even after adjusting for purchasing power, its economy is only about one-fifth the size of the United States'. However, Russia devotes a substantial fraction of its economy to its military. Crucially, it has the world's largest nuclear arsenal. And Russian leadership has shown a willingness to project power beyond their country's borders. Country Military spending in 2021 (2020 USD, PPP adjusted) United States: 801 billion China: 283 billion India: 76.6 billion United Kingdom: 68.4 billion Russia: 65.9 billion Top five countries by estimated military spending, 2021. Source: SIPRI Russia's 2022 invasion of Ukraine demonstrated the dangers of renewed rivalry between Russia and the United States-led West. The war has already been hugely destructive: the largest war in Europe since World War II, with hundreds of thousands of casualties alive and no end to the conflict in sight. And it could get much worse. Most notably, Russian officials have repeatedly refused to rule out the use of nuclear weapons. Unchecked interests and intangible incentives are again at play here. Vladimir Putin leads a highly-centralised government. He has spoken about how his desire to rebuild Russia's reputation played in his decision to invade Ukraine. Given their ideological differences and history of rivalry, it is reasonable to expect that the United States and Russia will continue to experience dangerous disagreements in the future. As of 8 June 2023, an aggregated forecast gives a 20% chance that the United States and Russia will fight a war involving at least 1,000 battle deaths before 2050. China-India India is already the world's third-largest economy. If national growth rates remain roughly constant, the size of the Indian economy will surpass that of the United States' sometime this century. India also has nuclear weapons and is already the world's third-largest military spender (albeit at a much lower level than China or the United States). One reason to worry that China and India could fight a war is that they already dispute territory along their border. Countries that share a border, especially when it is disputed, are more likely to go to war than countries that do not. By one count, 88% of the wars that occurred between 1816 and 1980 began as wars between neighbours.26 In fact, China and India already fought a brief but violent border war in 1962. Deadly skirmishes have continued since, resulting in deaths as recently as 2020. Forecasters agree that a China-India conflict seems relatively (though not absolutely) likely. An aggregated forecast gives a 19% chance of war before 2035. Other dangerous conflicts These three conflicts — United States-China, United States-Russia, and China-India — are not the only possible great power wars that could occur. Other potential conflicts could also pose existential risk, either because they drive dangerous arms races or see widespread deployment of dangerous weapons. We should keep in mind India-Pakistan as a particularly likely conflict between nuclear-armed states and China-Russia as a potential, though unlikely, conflict between great powers with a disputed border and history of war. Plus, new great powers may emerge or current great powers may fade in the years to come. While I think we should prioritise the three potential conflicts I've highlighted above, the future is highly uncertain. We should monitor geopolitical changes and be open to changing our priorities in the future. Overall predictions Below is a table listing relevant predictions from the forecasting platform Metaculus, including the number of predictions made, as of 10 March 2023. Note the different timescales and resolution criteria for each question; they may not be intuitively comparable. Prediction Resolution criteria Number of predictions Metaculus prediction World war by 2155 Either: A war killing >50% of global population, involving >50% of countries totalling >50% of global population from at least 4 continents. Or: A war killing at least >1% of global population, involving >10% of countries totalling >25% of global population 563 52% World III before 2050 Involving countries >30% of world GDP OR >50% of world population AND >10M deaths 1640 20% Global thermometer war by 2070 EITHER: 3 countries each detonate at least 10 nuclear warheads of at least 10 kt yield outside of their territory OR 2 countries each detonate at least 50 nuclear warheads of at least 10 kt outside of their territory 337 11% When will be the next great power war? Any two of the top 10 nations by military spending are at war "At war" definition: EITHER Formal declaration OR Territory occupied AND at least 250 casualties OR Media sources describe them as "at war" 25th percentile: 2031 Median: 2048 75th percentile: 2088 Never (not before 2200): 8% No non-text nuclear detonations before 2035 No nuclear detonation other than controlled test (Note the negation in the question. It resolves negatively if a warhead is detonated) 321 69% At least 1 nuclear detonation in war by 2050 Resolves according to credible media reports 476 31% I have previously independently estimated the likelihood of seeing a World War III-like conflict this century. My calculation first adjusts historical base rates to allow for the possibility that major wars have become somewhat less likely, and then uses the adjusted base rate to calculate the probability of seeing a war between now and 2100. This method gives a 45% chance of seeing a major great power war in the next 77 years. If the probability is constant over time then the cumulative probability between now and 2050 would be 22%. This is aligned with the Metaculus predictions above. We can also ask experts what they think. Unfortunately, there are surprisingly few expert predictions about the likelihood of major conflict. One survey was conducted by the Project for the Study of the 21st Century. The numbers were relatively aligned with the Metaculus forecasts, though slightly more pessimistic. However, it seems a mistake to put too much stock in this survey (see footnote).27 We now have at least a rough sense of a great power war's probability. But how bad could it get if it occurred? A new great power war could be devastating. At the time, the mechanised slaughter of World War I was a shocking step change in the potential severity of warfare. But its severity was surpassed just 20 years later by the outbreak of World War II, which killed more than twice as many people. A modern great power war could be even worse. How bad have wars been in the past? The graph below shows how common wars of various sizes are, according to the Correlates of War's Interstate War dataset.28 The x-axis here represents war size in terms of the logarithm of the number of battle deaths. The y-axis represents the logarithm of the proportion of wars in the dataset that are at least that large. Using logarithms means that each step to the right in the graph represents a war not one unit larger, but 10 times larger. And each step up represents a war that is not one unit more likely, but 10 times more likely. Cumulative frequency distribution of severity of interstate wars, 1816-2007 Source: Author's figure. See the data here. Data source: Correlates of War Interwar dataset, v4.029 What the graph shows is that wars have a heavy tail. Most wars remain relatively small. But a few escalate greatly and become much more than average. Of the 95 wars in the latest version of the database, the median battle death count is 8,000. But the heavy tail means the average is 334,000 battle deaths.30 The number of battle deaths is only one way to measure the badness of war. We could also consider the proportion of the population of the countries involved who were killed in battle. By this measure, the worst war since 1816 was not World War II. Instead, it's the Paraguayan War of 1864–70. In that war, 30 soldiers died for every 1,000 citizens of the countries involved. It's even worse if we also consider civilian deaths, while estimates are very uncertain, it's plausible that about half the men in Paraguay, or around a quarter of the entire population, was killed.31 What if instead we compared wars by the proportion of the global population killed? World War II is again the worst conflict since 1816 on this measure, having killed about 3% of the global population. Going further back in time, though, we can find worse wars. Genghis Khan's conquests likely killed about 5.5% of people in the world at the time. The heavy tail means that some wars will be shockingly large.32 The scale of World War I and World War II took people by surprise, including the leaders who initiated it. It's also hard to know exactly how big wars could get. We haven't seen many really large wars. So while we know there's a heavy tail of potential outcomes, we don't know what that tail looks like. That said, there are a few reasons to think that wars much worse than World War II are possible: We're statistically unlikely to have brushed up against the end of the tail, even if the tail has an upper bound. Other wars have been deadlier on a per-capita basis. So unless wars involving countries with larger populations are systematically less intense, we should expect to see more intense wars involving as many people as World War II. Economic growth and technological progress are continually increasing human war-making capacity. This means that, once a war has started, we're at greater risk of extremely bad outcomes than we're in the past. So how bad could it get? How bad could a modern great power war be? Over time, two related factors have greatly increased humanity's capacity to make war.33 First, scientific progress has led to the invention of more powerful weapons and improved military efficiency. Second, economic growth has allowed states to build larger armies and arsenals. Since World War II, the world economy has

grown by a factor of more than 10 in real terms; the number of nuclear weapons in the world has grown from basically none to more than 9,000, and we've invented drones, missiles, satellites, and advanced planes, ships, and submarines. Ghengis Khan's conquests killed about 10% of the world, but this took place over the course of two decades. Today that proportion may be killed in a matter of hours. First, nuclear weapons could be used. Today there are around 10,000 nuclear warheads globally.<sup>34</sup> At the peak of nuclear competition between the United States and the USSR, though, there were 64,000. If arms control agreements break down and competition resurges among two or even three great powers, nuclear arsenals could expand. In fact, China's arsenal is very likely to grow — though by how much remains uncertain. Many of the nuclear weapons in the arsenals of the great powers today are at least 10 times more powerful than the atomic bombs used in World War II.<sup>35</sup> Should these weapons be used, the consequences would be catastrophic. Graph showing that early nuclear weapons are 1,000s of times more explosive than previous conventional explosives Source: AI Impacts, Effect of nuclear weapons on historic trends in explosives

<<LINE BREAKS CONTINUE>>

By any measure, **such a war would** be by far the most destructive, dangerous event in human history, with **the potential to cause billions of deaths**.

**The probability that it would, on its own, lead to humanity's extinction or unrecoverable collapse, is contested.** But there seems to be some possibility — **whether through a famine caused by nuclear winter, or by reducing humanity's resilience enough that something else, like a catastrophic pandemic, would be far more likely to reach extinction-levels** (read more in our problem profile on nuclear war).

## Rebuttal

**O'Rourke 24** [Rebecca O'Rourke; ; Bridging the Clean Energy Talent Gap: Challenges and Solutions for a Sustainable Future, 14 Nov, 2024; No Publication, <https://www.nesfircroft.com/resources/blog/bridging-the-clean-energy-talent-gap--challenges-and-solutions-for-a-sustainable-future/>; accessed, 4-4-2025] //wickynang

These energy sources are increasingly favoured due to their lower environmental impact than traditional fossil fuels. However, alongside the promise of clean energy lies a significant challenge: **the talent gap in the sector**, which **poses risks to the successful transition** to clean energy.

Post '25 [Corinne Post; ; How To Solve The Energy Sector's Growing Skills Shortage, 2-20-2025; Forbes, <https://www.forbes.com/sites/corinnepost/2025/02/20/how-to-solve-the-energy-sectors-growing-skills-shortage/>; accessed, 4-4-2025] //wickynang

As **industries compete for skilled talent, workforce shortages are becoming a broader economic challenge**—whether in energy, AI or IT. Among energy sector employers, **71% struggle to find the skilled talent they need**, according to Manpower. The shortage of skilled workers is fueled by a sharp rise in energy demand, which is expected to double by 2050, based on a McKinsey report. Both fossil fuels and renewables are affected, albeit for different reasons.

On C3:

### 1. Even **unchecked** warming won't cause extinction.

**Ord '20** [Toby; 2020; Senior Research Fellow in Philosophy @ Oxford University, DPhil in Philosophy from the University of Oxford; Hachette Books, "The Precipice: Existential Risk and the Future of Humanity," p. 110-112; accessed: 12-6-2024] tristan

But the purpose of this chapter is finding and assessing threats that pose a direct existential risk to humanity. **Even at** such **extreme levels of warming, it is difficult to see** exactly **how climate change could do so**. Major effects of climate change include reduced agricultural yields, sea level rises, water scarcity, increased tropical diseases, ocean acidification and the collapse of the Gulf Stream. While extremely important when assessing the overall **risks** of climate change, **none of these threaten extinction or irrevocable collapse**. **Crops are** very sensitive to reductions in temperature (due to frosts), but **less sensitive to increases**.

By all appearances **we would still have food to support civilization**.<sup>85</sup> **Even if sea levels rose hundreds of meters** (over centuries), **most** of the Earth's **land area would remain**. Similarly, while some areas might conceivably become uninhabitable due to water scarcity, **other areas will have increased rainfall**. **More areas may become susceptible to tropical diseases, but** we need only look to **the tropics** to see civilization **flourish despite this**. The main effect of a collapse of the system of Atlantic Ocean currents that includes the Gulf Stream is a 2°C cooling of Europe—something that poses no permanent threat to global civilization. From an existential risk perspective, a more serious concern is that the high temperatures (and the rapidity of their change) might cause a large loss of biodiversity and subsequent **ecosystem collapse**. **While the pathway is not entirely clear, a large enough collapse of ecosystems across the globe could perhaps threaten human extinction**. The idea that climate change could cause widespread extinctions has some good theoretical support.<sup>86</sup> Yet the **evidence is mixed**. For when we look at many of the **past cases of extremely high global temperatures**, or extremely rapid warming **we don't see a corresponding loss of biodiversity**.<sup>87</sup> **we don't see such biodiversity loss in the 12°C warmer climate of the early Eocene, nor the rapid global change of the PETM, nor in rapid regional changes of climate**. Willis et al. (2010) state: "We argue that although the underlying mechanisms responsible for these past changes in climate were very different (i.e. natural processes rather than anthropogenic), the rates and magnitude of climate change are similar to those predicted for the future and therefore potentially relevant to understanding future biotic response. What emerges from these past records is evidence for rapid community turnover, migrations, development of novel ecosystems and thresholds from one stable ecosystem state to another, but **there is very little evidence for**

**broad-scale extinctions due to a warming world.”** There are similar conclusions in Botkin et al. (2007), Dawson et al. (2011), Hof et al. (2011) and Willis & MacDonald (2011). The best evidence of warming causing extinction may be from the end-Permian mass extinction, which may have been associated with large-scale warming (see note 91 to this chapter). So the most important known effect of climate change from the perspective of direct existential risk is probably the most obvious: heat stress. We need an environment cooler than our body temperature to be able to rid ourselves of waste heat and stay alive. More precisely, we need to be able to lose heat by sweating, which depends on the humidity as well as the temperature. A landmark paper by Steven Sherwood and Matthew Huber showed that with sufficient warming **there would be parts of the world whose temperature and humidity combine to exceed the level where humans could survive without air conditioning**.<sup>88</sup> With 12°C of warming, a very large land area—where more than half of all people currently live and where much of our food is grown—would exceed this level at some point during a typical year. Sherwood and Huber suggest that such areas would be uninhabitable. This may not quite be true (particularly if air conditioning is possible during the hottest months), but their habitability is at least in question. **However, substantial regions would also remain below this threshold. Even with an extreme 20°C of warming there would be many coastal areas** (and some elevated regions) **that would have no days above the temperature/humidity threshold**.<sup>89</sup> so **there would remain large areas in which humanity and civilization could continue**. A world with 20°C of warming would be an unparalleled human and environmental tragedy, forcing mass migration and perhaps starvation too. This is reason enough to do our utmost to prevent anything like that from ever happening. However, our present task is identifying existential risks to humanity and it is hard to see how any realistic level of heat stress could pose such a risk. So the runaway and moist greenhouse effects remain the only known mechanisms through which climate change could directly cause our extinction or irrevocable collapse. This doesn’t rule out unknown mechanisms. We are considering large changes to the Earth that may even be unprecedented in size or speed. It wouldn’t be astonishing if that directly led to our permanent ruin. The best argument against such unknown mechanisms is probably that the PETM did not lead to a mass extinction, despite temperatures rapidly rising about 5°C, to reach a level 14°C above pre-industrial temperatures.<sup>90</sup> But this is tempered by the imprecision of paleoclimate data, the sparsity of the fossil record, the smaller size of mammals at the time (making them more heat-tolerant), and a reluctance to rely on a single example. Most importantly, anthropogenic warming could be over a hundred times faster than warming during the PETM, and rapid warming has been suggested as a contributing factor in the end-Permian mass extinction, in which 96 percent of species went extinct.<sup>91</sup> In the end, we can say little more than that direct **existential risk from climate change appears very small** but cannot yet be ruled out.

### 3. **Emissions increase. Empirics prove.**

**Jacobson '24** [Mark Z. Jacobson; Professor of Civil and Environmental Engineering at Stanford; 10-10-2024; "7 reasons why nuclear energy is not the answer to solve climate change"; One Earth; <https://www.oneearth.org/the-7-reasons-why-nuclear-energy-is-not-the-answer-to-solve-climate-change/>; accessed 03-01-2025] **leon**

**There is no such thing as a zero- or close-to-zero emission nuclear power plant. Even existing plants emit due to the continuous mining and refining of uranium needed for the plant.** Emissions from new nuclear are 78 to 178 g-CO<sub>2</sub>/kWh, not close to 0. Of this, 64 to 102 g-CO<sub>2</sub>/kWh over 100 years are emissions from the background grid while consumers wait 10 to 19 years for nuclear to come online or be refurbished, relative to 2 to 5 years for wind or solar. In addition, **all nuclear plants emit 4.4 g-CO<sub>2</sub>e/kWh from the water vapor and heat they release. This contrasts with solar panels and wind turbines, which reduce heat or water vapor fluxes to the air by about 2.2 g-CO<sub>2</sub>e/kWh for a net difference from this factor alone of 6.6 g-CO<sub>2</sub>e/kWh.**

In fact, **China’s investment in nuclear plants that take so long between planning and operation instead of wind or solar resulted in China’s CO<sub>2</sub> emissions increasing 1.3 percent from 2016 to 2017 rather than declining by an estimated average of 3 percent.** The resulting difference in air pollution emissions may have caused 69,000 additional air pollution deaths in China in 2016 alone, with additional deaths in years prior and since.

### 4. **Even if we cut all emissions immediately.**

**Karis '24** (Demetrios Karis, Adjunct Lecturer, Bentley University, 2024, EarthArXiv, “Civilization will Collapse (High Confidence): A Compendium of Relevant Biophysical, Political, Economic, Military, Health,

and Psychological Information on Climate Change”, accessed 9-3-2024,  
<https://eartharxiv.org/repository/object/6520/download/14052/>) jordan

Over **90% of the extra energy from global warming is taken up by the oceans**. Although heat mixes rapidly down to about 150 feet, **it can take over a thousand years for heat to mix completely throughout the ocean. This creates an extreme thermal lag. Even if we completely eliminate all greenhouse gas emissions and remove millions of tons of carbon dioxide from the atmosphere, sea level will continue to rise**, probably **for hundreds of years, as the oceans will continue to release the heat they have been accumulating. Glaciers and ice sheets will continue to melt, while land and atmospheric temperature will drop only slightly during this time**. We can prevent the world from heating up to an extreme state via rapid decarbonization, but **the earth will not cool by itself after we stop burning fossil fuels**. We can cool the earth via geoengineering, but without additional research and testing, this may have devastating consequences, as described in a separate section below.

## 5. Non-electrified sectors zero solvency.

**Meyer '19** [Robinson; Former Staff Writer @ the Atlantic ; March 5; Atlantic; “There Really, Really Isn’t a Silver Bullet for Climate Change,”  
<https://www.theatlantic.com/science/archive/2019/03/why-nuclear-power-cannot-solve-climate-change-alone/584059/>; DOA: 3-26-2025] tristan

But **you can’t put a nuclear reactor in a tractor-trailer or a steel plant. Nuclear can only reduce emissions from the power sector**, and **“the energy system is bigger than just electricity,”** says Sam Ori, the executive director of the Energy Policy Institute at the University of Chicago. “While I think nuclear has real potential as a means to decarbonizing electricity, **you still have a lot of sectors to worry about.**”

In fact, **electricity makes up a smaller and smaller part of the climate problem**. Right now, **the power sector contributes only about a third of annual U.S. carbon emissions** related to energy production. **When you factor in land change and agriculture** (read: deforestation and all those pesky cows), **electricity is responsible for only about a quarter of annual U.S. emissions**. And **its share is declining**. Carbon emissions from the U.S. power sector **have fallen 28 percent since 2005**. Meanwhile, emissions from other parts of the economy—transportation, agriculture, industry—have fallen by only 5 percent.

**“Even if you figure out electricity, you still have to figure out industry.** You still have to figure out **transportation,**” Ori told me. **Although we have partial answers** to some of the problems posed by those sectors—everyone could buy **electric cars, for instance**, and charge them off the new nuclear-powered grid—**we don’t have total ones**. We still have **no electrified way of moving around freight. Electrified air travel remains notional**. All the nuclear plants in the world could not reduce the importance of **oil in steel production**. Solving all these problems will require some kind of public policy, Ori said; **even electric cars won’t replace their gas-powered brethren without a regulatory nudge**. Sullivan’s nuclear build-out has nothing to say about such challenges.

## AT OIL

1. Their peak evidence doesn’t say 2025 it says he tried to predict it in 2017 as 2025 but its actually 2030 for their impact of global oil wars to trigger
2. **No oil wars.**



**Meierding 20**, assistant professor of national security affairs at the Naval Postgraduate School in Monterey, California. (Emily, 8-2-2020, "**The Exaggerated Threat of Oil Wars**", *Lawfare*, <https://www.lawfareblog.com/exaggerated-threat-oil-wars>)

Happily, the **historical record** indicates that China and its neighbors are **unlikely to escalate their energy sparring**. Contrary to **overheated rhetoric**, countries **do not actually "take the oil,"** to use President Trump's controversial and inaccurate phrase. Instead, **my recent research demonstrates** that **countries avoid fighting for oil resources**.

#### No Blood for Oil

**Between 1912 and 2010, countries fought 180 times over territories that contained—or were believed to contain—oil or natural gas resources.** These conflicts ranged from brief, nonfatal border violations, like Turkish jets entering Greek airspace, to the two world wars. Many of these clashes—including World War II, Iraq's invasion of Kuwait (1990), the U.S. invasion of Iraq (2003), the Iran-Iraq War (1980-1988), the Falklands War (1982), and the Chaco War between Bolivia and Paraguay (1932-1935)—have been described as classic oil wars: that is, severe international conflicts in which countries fight to obtain petroleum resources.

However, **a closer look** at these conflicts reveals that **none** merits the classic **"oil war" label**. Although countries did fight over oil-endowed territories, **they** usually **fought for other reasons**, including aspirations to **regional hegemony, domestic politics, national pride, or contested territories' other strategic, economic, or symbolic assets**. **Oil was an uncommon trigger for international confrontations and never caused major conflicts.**

On approximately 20 occasions, over almost a century, countries engaged in minor conflicts to obtain oil resources. However, these **"oil spats" were brief, mild, mostly nonfatal, and generally involved countries whose hostility predated their resource competition**. Greece and Turkey have prosecuted oil spats. So have China and Vietnam, Guyana and Venezuela, and a dozen other pairs of countries. **These confrontations inspired aggressive rhetoric** while they were underway, **but none** of them **ever escalated into a larger armed conflict**.