# 1AC

### 1AC---Jobs

#### Contention 1 is JOBS.

#### The economy will decline due to Trump’s tariffs.

Mutikani '25 reports [Lucia Mutikani; Correspondent at Reuters; 04-03-2025; "US economy slowing heading into tariffs turbulence"; Reuters; https://www.reuters.com/markets/us/us-weekly-jobless-claims-fall-labor-market-stays-stable-now-2025-04-03/; accessed 04-04-2025] leon

Fitch Ratings estimated that **the nation's tariff rate was now the highest in more than a century**. **Economists have warned of high inflation and possible job losses as households slash spending and businesses pull back on investment**, potentially pushing the economy into recession. Business and consumer sentiment had already tanked before Trump's sweeping tariffs.

"**This adverse trade news from the White House is an extreme external shock to the economy that is in all the university textbooks**, and so too is the need for being on high alert for signs of recession," said Christopher Rupkey, chief economist at FWDBONDS. "**Weekly job layoffs made by companies are minimal at the moment, but it is too early to forecast what businesses will do in the weeks and months ahead**."

Initial claims for state unemployment benefits dropped 6,000 to a seasonally adjusted 219,000 for the week ended March 29, the Labor Department said on Thursday. Economists polled by Reuters had forecast 225,000 claims for the latest week.

Low layoffs have kept the labor market humming. There were 1.07 job openings for every unemployed person in February, down from 1.13 in January, the government reported on Tuesday.

But **economists worry that Trump's tariffs blitz since returning to the White House in January could hurt the labor market**. **Trump sees tariffs as a tool to raise revenue to offset his promised tax cuts and to revive a long-declining U.S. industrial base, a view not shared by economists**.

U.S. **stocks opened sharply lower**. **The dollar plunged against a basket of currencies**. U.S. Treasury yields fell.

#### More broadly, oil decline is inevitable and crashes the economy.

**Ahmed ‘23 continues** [Nafeez Ahmed, PhD in International Relations from the University of Sussex’s School of Global Studies, 3-29-2023, America’s Fossil Fuel Economy is Heading for Collapse – It Signals the End of the Oil Age, resilience, https://www.resilience.org/stories/2023-03-29/americas-fossil-fuel-economy-is-heading-for-collapse-it-signals-the-end-of-the-oil-age/, tristan]

US oil production is about to peak, but the world is unprepared for the tremendous economic and political consequences. The only path through is **energy and economic transformation**.

The global economy is currently teetering **on** the **edge** of a banking crisis. The IPCC has just released its final major report warning that global carbon emissions need to peak and decline immediately if we are to avoid plunging into dangerous global warming by breaching the 1.5C ‘safe limit’. And in recent weeks and months, industry leaders have announced that the US shale oil and gas **revolution is over.**

Yet few if anyone is talking about why these things are happening at the same time, and what they really mean.

One of our biggest problems is that we tend to think in silos and sectors. But in the real world, the sectors we assume operate separately are in fact **fundamentally interconnected**. We ignore and downplay these systemic interconnections at our peril.

The persistence of global inflation has taken many economists by surprise. While they recognise that the impact of Russia’s war in Ukraine on energy and food supplies has been the biggest driver, that silo-ed assumption has led to a failure to understand why inflation is unlikely to simply disappear anytime soon.

We have good reason to believe that the underlying drivers of inflation go beyond just the war in Ukraine. Although it’s extremely difficult to quantify, climate change and environmental degradation is driving inflation by eroding agricultural productivity leading to higher food costs. The impact of extreme weather events is also creating larger and larger damages to infrastructure which in turn is incurring greater costs. As these costs feed into the system, the supply of goods and services becomes more expensive.

Less difficult to quantify is the fact that inflation is historically linked to energy price hikes. And there is mounting evidence that the world is experiencing a major shift in the global fossil fuel system that entails rising costs and diminishing returns, which will end up having a major inflationary effect for far longer and deeper than conventionally assumed.

The end of the shale boom

Since late last year, there have been a growing number of reports pointing out that the US shale revolution is coming to an end. Yet the massive global consequences of this are not being discussed.

“US Shale Boom Shows Signs of Peaking as Big Oil Well **Disappear**” read one headline in the Wall Street Journal. “The **aggressive growth era** of US shale is **over**,” Scott Sheffield, CEO of top independent shale firm Pioneer told the Financial Times. “The shale model definitely is no longer a swing producer.” And according to Bloomberg: “The specter of peak oil that haunted global energy markets during the first decade of the 21st century is once again rearing its head”.

US **industry executives are** now **openly acknowledging** that US oil production is likely to peak within the next five or six years, or perhaps in 2030. But there is mounting evidence that the peak will come much earlier, with some industry observers pinpointing its arrival as early as within the **next one or two years.**

What’s extraordinary about these admissions is how little they are impacting public debate. The implications are seismic. They contradict bullish overinflated forecasts of the industry made two decades ago – in 2005, for instance, Washington DC think-tank RAND Corp was forecasting that the US had enough shale oil to last some 400 years; and in 2012, a senior ExxonMobil executive claimed that the US has “about 100 years of natural gas supply”.

These grand claims were often breathlessly reported as unimpeachable fact by some of the most respected media institutions in the world.

Naysayers (like myself) warning that shale oil and gas would offer at best a temporary boost that was bound to peak and decline in the near-term with major global economic consequences, were dismissed as ‘doomers’.

Now, it turns out, we were right all along.

Mistakes of forecasting

That’s not to say that the traditional ‘peak oilers’ at the time were spot on. They wrongly expected that following the plateauing of conventional oil around 2005, oil prices would rocket up permanently into triple digits as global oil production would go into terminal decline. That didn’t happen. Instead, global demand shifted to the more expensive forms of unconventional oil and gas – especially US shale – which made-up much of the short-fall as conventional oil production slowed down.

But this was a recessionary environment, so global demand was much lower than expected. The massive 2005-2008 global oil price spikes helped induce a banking collapse. After the 2008 financial crash, this meant that there was much less demand for oil – but as oil production projects are planned years in advance pegged to expectations of demand, the oil just kept pumping despite much lower demand due to economic recession.

The result was a glut of shale oil and gas on world markets that allowed oil prices to drop and fuelled widespread belief in a new era of ‘Made in America’ cheap oil.

The US shale boom had a good run, no doubt about it – but its ‘healthy’ lifespan appears to be around two decades. If US shale oil and gas is about to peak and decline in the next few years, what does this mean for the US and global economy?

Coming economic contraction

Given that the US shale revolution played the key role in keeping global oil prices down and lubricating the energy requirements of continued economic activity, the retraction of the US shale revolution will have **massive economic impacts**.

US production has accounted for around **70% of the total increase** in global oil capacity since 2019, and 75% of growth in liquified gas supplies. So as US shale oil and gas peaks, plateaus and declines, global oil and gas production **will do so too very shortly after.**

Gulf oil and gas producers, however, will not be able to step-in to fill the shortfall. US oil production is currently averaging around 11 million barrels per day (mbd).

A 2022 analysis of production data among the Organisation of Petroleum Exporting Countries (OPEC) which include the biggest powerhouses such as Saudi Arabia and the UAE, suggests that the maximum OPEC could collectively increase production is around 4.5 mbd – that is, **less than half of current US shale production.**

It’s also not clear how long OPEC can deploy spare capacity to maintain maximum levels of production. This suggests that OPEC will not be able to meaningfully fill the supply gap as US shale declines, which is a clear indicator that total global oil production will eventually begin to peak and decline.

In 2017, I assessed these trends in Failing States, Collapsing Systems. I predicted that US oil and gas production would probably peak and plateau **around 2025**, and that major Middle East producers would peak and plateau around the 2030s. This scenario now appears to be **unfolding before our eyes**. Yet no one is talking about it.

The near-term **economic and financial consequences** will be devastating, and they could lead to permanent long-term consequences without significant transformative action. The impact on the US economy will be profound.

Shale production accounted for **10% of GDP growth** in the United States from 2010-2015, which means that the next decade of shale’s plateauing and decline will gradually **wipe this** out. This will be experienced as a protracted inflationary economic crisis which, in turn, will contribute to volatility in global financial markets. Pundits will likely fail to understand these systemic interlinkages, focusing instead on failing banks, financial institutions and debt, without understanding its energetic triggers.

All this implies that we are **sleepwalking into a global energy crisis** that will, without accelerating the clean transformation of the energy system, create severe economic and financial consequences by undercutting the fundamental energetic basis of global economic flows. This will compound accumulated vulnerabilities in the banking system linked to unsustainable forms of debt.

The reverberations and bailouts seen in the cases of the Silicon Valley Bank, Credit Suisse and others are merely the opening cracks, that will become widening fissures in the absence of root-and-branch economic restructuring linked to the rapid development of a new energy system.

While that new system is still emerging, it is perhaps unavoidable that we will hit a number of bottlenecks. The danger is that instead of using these bottlenecks to restructure and adapt positively, we may end up regressing, with a loss of capital and energy that forestalls the full potential of transformation.

The window for action is extremely short: we need to act within this decade. Along the way, we need to be aware of the major trends which are likely to emerge as a result of the end of the US shale boom:

1. The illusion of cheap oil is evaporating

While we may still see fluctuating prices, it is becoming clearer that the glut of cheap oil this last decade was not a permanent feature of the energy system, but a temporary symptom of highly specific circumstances as the energy system moves deeper into a state of increasing inputs and diminishing returns. The immediate impact of the peak and plateau of US shale will be sustained high oil prices.

2. The near-term beneficiaries of this will be Gulf oil and gas producers

They currently appear to be the only fossil fuel energy suppliers with sufficient capacity to maintain production. They will therefore not only begin to dominate market share, they will also of course continue to reap higher profits from this more advantageous market position amidst high oil prices.

3. Some capital will move into OPEC for safety, but this is a mirage

Just as this last decade created the illusion of fossil fuel abundance due to the US shale boom, we may see that OPEC’s near-term ability to ramp up spare capacity as shale production declines perpetuates this illusion. We can expect to see lots of bullish statements from Gulf oil producers vindicating grand plans to expand their oil and gas production. Capital will move rapidly into OPEC countries, seen as a last safe space for investors looking for stability and growth. However, OPEC producers will also begin experiencing their twilight very shortly after the decline of US shale, which means that investors will begin to make serious losses as a result far sooner than they imagine.

4. Oil prices will **fluctuate within a higher range** as US shale peaks

While we can expect significant oil price volatility due to the recessionary impact of high oil prices which would lower demand and therefore allow prices to drop, as we move further into the era of plateau and decline across US and OPEC production, the overall decline in supply is likely to lead oil price fluctuations to narrow within a far higher range which will become a ‘new normal’ as long as oil demand remains high. This may also incentivise near-term conviction in the idea that new oil and gas investments are economical. That would be a colossal mistake, though, as we will see below due to coming reductions in oil demand in the latter half of this decade that will ameliorate high prices and make fossil fuel enterprises increasingly unprofitable.

5. We can expect heightened political polarisation

Incumbent industry ideology will likely blind many energy actors from recognising the writing on the wall – which explains the regressive self-defeating actions of the Biden administration in committing to Arctic drilling. This is like betting on the losing horse after being told it’s about to be overtaken by cars. It illustrates the power of America’s oil lobbies in their last ditch desperate attempt to stay alive on the back of taxpayer subsidies – flying in the face of hard economic realities (a few years ago I broke the story of the British military study which concluded that Arctic drilling was pointless for economic reasons because the costs are so high and returns so low as to make it commercially infeasible). That in turn suggests the political battleground between fossil fuel lobbies and clean energy advocates will become more fraught as the incumbency seeks to double-down in demanding more government subsidies. **Millions of jobs** will be at risk as the US shale industry declines, and this could create further negative economic and cultural consequences as the US returns to net import status.

6. Clean energy transformation will be critical to stabilise the global **economy and restore prosperity**

The **only viable pathway** through this crisis will be to accelerate the clean energy transformation focused on the deployment of exponentially improving technologies which are already scaling because they are cost-competitive with fossil fuels – namely, solar, wind and batteries. This will lay the groundwork for other potential applications such as e-fuels or green ammonia from green hydrogen. This transformation is already underway, and provides the opportunity for the US and others to produce larger quantities of energy at a fraction of the costs of fossil fuels. In Rethinking Climate Change, a RethinkX report for which I was contributing editor, we found that even in the absence of appropriate policy-decisions and major institutional barriers, economic factors will inevitably drive incumbent industries to collapse by 2040 as they are replaced by new solar, wind and battery systems. Unfortunately, while this is far faster than conventional analysts acknowledge, this is **not fast enough** to avoid dangerous climate change.

#### Affirming is key to growth.

Watson '22 writes [Nicholas Watson; IAEA Department of Nuclear Energy; Lucy Ashton; IAEA Department of Nuclear Energy; 04-14-2022; "Towards a Just Energy Transition: Nuclear Power Boasts Best Paid Jobs in Clean Energy Sector"; International Atomic Energy Agency; https://www.iaea.org/newscenter/news/towards-a-just-energy-transition-nuclear-power-boasts-best-paid-jobs-in-clean-energy-sector; accessed 02-25-2025] leon

**The move to clean energy will generate more jobs than are lost with the transition away from fossil fuels and the highest paid ones will continue to be in nuclear power, which provides significant and sustainable employment benefiting local and regional economies**, according to new research presented at an IAEA event.

With more than 130 countries either committing to or considering a target of net zero greenhouse gas emissions by 2050, **preparing for how this energy transition will affect the job market is critical**. Representatives from the clean energy industry joined a recent IAEA webinar on how rising living standards and job creation can be ensured as energy investments align to meet climate goals.

“Moving away from the use of fossil fuels must not leave anyone behind – this is the concept of a Just Transition,” Henri Paillere, Head of the IAEA Planning and Economic Studies Section, said at the webinar on “Investing in Low Carbon Technologies: Job Creation for Just Energy Transitions”. “Investing in all clean technologies is needed on a massive scale and this must be done in way that creates jobs, economic growth and supports sustainable development.”

**Investments in clean energy sources such as solar, wind and nuclear have a positive impact on gross domestic product** (**GDP**) **that is two to seven times stronger than spending on fossil sources such as gas, coal and oil**, according to an International Monetary Fund working paper. Analysis presented at the webinar by the International Renewable Energy Agency (IRENA) predicts that in a scenario where the global temperature rise is limited to 1.5° Celsius, consistent with global climate goals, **jobs in the renewables sector could grow from 12 million to 38 million by 2030**.

**Other energy transition-related jobs** – such as energy efficiency, power grids, energy system flexibility – **could grow from 16 million to 74 million over the same period**, said Michael Renner, Programme Officer in the Knowledge, Policy and Finance Centre at IRENA. By contrast, **conventional energy jobs would decline from 39 million to 27 million**.

“Clearly the raw numbers alone look quite good,” Renner said. “**The transition-related jobs outweigh the job losses in fossil fuels**.”

According to the IMF paper, **investments in nuclear power produce the biggest economic multiplier effect of any clean energy source**. **Nuclear power creates about 25% more employment per unit of electricity than wind power**, while workers in the nuclear industry earn one third more than those in the renewables sector, the paper showed.

Similar findings were presented by Philippe Costes, Senior Advisor at the World Nuclear Association (WNA). “**Nuclear offers jobs with higher wages than any other energy technology, roughly 25-30% higher**. But importantly, **while nuclear provides jobs locally around the plant and in regional economies during construction similar to wind, during operation only nuclear provides significant and sustainable jobs to the local and regional economies**,” Costes said at the webinar.

#### Indeed, it provides a stable alternative.

**Lee ’10 continues** [Chien-Chiang Lee, Professor of Finance @ National Sun Yat-sen University (Kaohsiung, Taiwan) & Ph.D. in International Economics @ Chung Cheng University, 6-24-2010, Nuclear energy consumption, oil prices, and economic growth: Evidence from highly industrialized countries, Energy Economics, https://sci-hub.ru/10.1016/j.eneco.2010.07.001, Willie T.]

During the two energy crises in the 1970s, the price of oil **doubled, even tripled** in some countries, resulting in an increase of production cost and sharply reducing export competitiveness, which may have reduced imported-energy-dependent countries' economy performance and international competitiveness. Fossil fuels including coal, oil, and gas nowadays provide **85% of energy needs**, and fossil-fuelled economic growth is the **main factor for global warming** through the release of carbon dioxide (CO2) into the atmosphere. In December 1997 the third session of the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in Kyoto, Japan adopted the Kyoto Protocol. Annex I countries agreed to reduce their collective greenhouse gas emissions by 5.2% from their 1990 level by 2008 to 2012. The U.S. President Obama's New Energy for America plans to reduce 10 million barrels of oil consumption per day by 2030 and to cut the country's collective greenhouse gas emissions by 80% from the 1990 level by 2050.

To combat these energy and environmental configurations, one of the important priorities of energy and environmental policy is to **diversify the sources of energy** and to find a **secure, cheap, and nonGHG**-emitting energy supply (Fiore, 2006; Vaillancourt et al., 2008; Wolde-Rufael, 2010). As noted by the International Energy Agency (IEA, 2008), nuclear energy may **answer these conditions**, as it **reduces the instability** of oil prices, the dependence on oil imports for many countries, and greenhouse gas emissions. Therefore, nuclear energy (non-carbon energy) may be a **crucial substitute** energy for oil, and whether imported-energy-dependent countries can adopt nuclear energy to replace the majority of fossil fuels in their economy has become an important issue.

#### Otherwise, unemployment kills.

Crudele '20 quantifies [John Crudele; Columnist and Business Journalist; 04-20-2020; "Is unemployment really as deadly as coronavirus?"; New York Post; https://nypost.com/2020/04/20/explaining-the-link-between-unemployment-deaths-amid-coronavirus/; access at https://archive.ph/Zn0Am#selection-779.5-779.53; accessed 04-04-2025] leon

Pitt’s Rickert chastises his colleagues for acting so happy and says: “**Every 1 percent unemployment goes up, 40,000 people die**. Did you know that?”

**Is that 40,000 figure just Hollywood nonsense**?

**Well, it’s not**. Or at least it is close. And that, in a nutshell, is what President Trump has to deal with right now.

If he opens up the economy, there could be a spike in cases of coronavirus and a rise in deaths unless there is some medical breakthrough. Already, 41,000 people are reported to have died from the disease in the US alone.

But **if the president keeps the economy closed, the unemployment rate is bound to climb** and if you believe Pitt’s character — and the academic research upon which that statement is based — people will die because of that as well.

There’s a technical term for this — it’s called being damned if you do and damned if you don’t.

**Before the economic mess this virus caused, the US unemployment rate was just 3.5 percent**. In March, it rose to 4.4 percent. And there are predictions that it will go as high as 13 percent and maybe even 15 percent before people start returning to work.

So, **if the calculations are correct, that 10 percentage point-plus rise in the jobless rate would cause more than 400,000 deaths that have nothing to do with the virus** and everything to do with the distressed economy.

#### Indeed, a recession is devastating.

Bradford ’13 furthers [Harry Bradford, Prize-winning conductor and choral director; 4-5-2013, "Three Times The Population Of The U.S. Is At Risk Of Falling Into Poverty," HuffPost, https://www.huffpost.com/entry/global-poverty-900-million-economic-shock\_n\_3022420, accessed on 10-16-2023] tristan + leon

Hundreds of millions of people worldwide are on the brink of poverty. A recent study by the International Monetary Fund warns that as many as **900 million people could fall back into poverty in the event of an economic shock like the Great Recession**. **That figure is three times the size of the U.S. population**. According to the World Bank, 1.2 billion people are currently living on less than $1.25 a day.

#### Even worse, economic decline causes great power war.

Brands ’21 writes[Hal Brands; professor @ John Hopkins University and senior fellow @ the American Enterprise Institute; 09-24-2021; “China Is a Declining Power—and That’s the Problem”; Foreign Policy; https://foreignpolicy.com/2021/09/24/china-great-power-united-states/; accessed 02-10-2025] tristan

**Slowing growth** makes it **harder** for leaders to **keep the public happy**. Economic underperformance weakens the country against its rivals. Fearing **upheaval**, leaders **crack down on dissent**. They maneuver desperately to keep geopolitical enemies at bay. Expansion seems like a solution—a way of **grabbing economic resources** and **markets**, making nationalism a **crutch** for a **wounded regime**, and **beating back foreign threats**.

**Many countries** have **followed this path**. When the United States’ long post-Civil War **economic surge ended**, Washington violently **suppressed strikes and unrest at home**, built a powerful blue-water Navy, and engaged in a **fit of belligerence** and imperial **expansion during the 1890s**. After a fast-rising imperial Russia fell into a deep slump at the turn of the 20th century, the tsarist government cracked down hard while also enlarging its military, seeking colonial gains in East Asia and sending around 170,000 soldiers to occupy Manchuria. These moves backfired spectacularly: They antagonized Japan, which beat Russia in the first great-power war of the 20th century.

A century later, Russia became aggressive under similar circumstances. Facing a **severe, post-2008 economic slowdown**, Russian President Vladimir Putin invaded two **neighboring countries,** sought to create a new Eurasian **economic bloc**, staked Moscow’s claim to a resource-rich Arctic, and steered Russia deeper into dictatorship. Even democratic France engaged in **anxious aggrandizement** after the end of its **postwar economic expansion** in the 1970s. It tried to rebuild its old sphere of influence in Africa, deploying 14,000 troops to its former colonies and undertaking a dozen military interventions over the next two decades.

#### High oil prices cause World War III.

**Bunzel ’18 concludes** [Theodore Bunzel; Head of Lazard Geopolitical Advisory; 5-30-2018, "Do High Oil Prices Mean More International Conflict?", American Interest, https://www.the-american-interest.com/2018/05/30/do-high-oil-prices-mean-more-international-conflict/] sumzom

Does the relationship between oil prices and Russian behavior to which Bush alluded hold true? The higher the price of oil, the more aggressive Russia becomes? And what about other petrostates? Might it be true for those as well?

We may soon have more evidence for the proposition. Oil prices are brushing off 2016 lows and hitting three-year highs. Brent crude has been hovering above $70 a barrel since April, up from lows of around $30 in early 2016, fueled by OPEC production cuts and rising geopolitical tensions (over issues like the Iran deal). Though nuances, complications, and exceptions abound, the academic and historical evidence on balance tells us that, as we transition from a lower to a higher oil price regime, we can generally expect a darker geopolitical outlook. As rising oil revenues gives Russia, Saudi, Iran, and other oil-exporters an **added sense of confidence**, it may at least selectively inflame interstate tensions and lead to more aggressive behavior. That possibility, alongside an increasingly **hawkish U.S. national** security team and a President who appears to feel rather “unchained” of late, points to a potentially combustible mix just ahead.

It is generally taken for granted that aspects of geopolitics can function as a key input into oil prices. Trump’s mere threat of a U.S. strike in Syria, for example, caused oil to spike by 2 percent on April 11. In addition to short-term effects, geopolitical competition can influence prices in other ways. To give just one general example, as Soviet power spread into parts of the Third World after the independence era, some states felt safer nationalizing their oil industries to escape Western company control (Iraq in 1961, for example), and prices rose as a consequence.

But the relationship may also work the other way around: Oil prices can also be a key input into geopolitics. Many studies have demonstrated that oil prices have a direct effect on the domestic stability of petrostates. This makes ample intuitive sense: Higher prices **fill public coffers**, allowing governments to **palliate needy populations** and **potential elite opposition groups** by dispensing more largesse. Some regime elites may reason that a firmer grip on power may free them to carry out more assertive foreign policies without fear of being undermined at home.

There are, however, several complications to this general intuition. Some states already have sufficiently buoyant revenues relative to their small populations to satisfy their publics and feed clientelistic networks. Providing largesse can also backfire if prices drop; taking away something valuable that people have grown used to is a dangerous game, especially when elites aren’t ready to play it. And then of course there is the famed “oil curse”: For all sorts of reasons, from “Dutch disease” economic distortions to the derangement of normal citizen-state relationships, oil riches can in time undermine regimes, weakening and even destroying them.

That said, a more recent body of research has empirically demonstrated the intuitive twin of this conclusion: Higher prices cause greater interstate aggression by oil-producing countries. Why would this be the case? Greater oil revenue flushes petrostates with confidence and also cash that they can put toward military spending or foreign adventures. To take one obvious example, we need only look to Iran’s using its oil revenue to **fund proxy groups** such as Hamas and Hezbollah. Furthermore, military spending by one regional oil producer can beget spending by others, fueling regional **arms races** that can make **aggression** and conflict by **miscalculation** more likely. The onset of the **Iran-Iraq War** in September 1980 may be a **prime example** of that dynamic.

Most prominent among the empirical studies is Cullen S. Hendrix’s 2014 paper, which shows a statistically significant relationship between higher oil prices and “dispute behavior” (military actions short of actual war) by oil-exporters. (Hendrix also summed it up nicely in this Washington Post piece.) He found that “all things being equal, a one standard deviation ($18.60) increase in the price per barrel of oil from the sample mean ($33.81) is associated with a **13 percent** increase in the frequency of [dispute behavior]” in oil-exporting states. He also found that, above $77 a barrel, oil-exporters are significantly more dispute prone than non-oil exporters.

Hendrix also explores the potential complication of reverse causality: Could dispute behavior by oil-exporting countries be driving prices higher, rather than the other way around? A key analytical consideration here is timing. We can all agree that geopolitical activity affects prices in the short-term (such as the Syria example mentioned above), but is this reverse causality true on a sustained basis? Parsing out long-term signal from short-term noise, Hendrix examines whether elevated aggregate dispute behavior affects oil prices at the yearly—rather than daily or weekly—level, and finds that this relationship does not hold. His explanation here is that other players typically step in to redress markets: “While dispute behavior may drive prices changes in the short term . . . the **strategic significance** of oil prices and oil-exporting states encourages major powers to act in ways that stabilize markets, either through market intervention . . . or **direct, armed intervention**.”

Jeff Colgan of Brown University has also touched on this topic, finding through his research that oil has fueled—in some way—**one quarter to one half of interstate wars since 1973**. He also notes that oil-producers are **50 percent more likely** to engage in conflict than non-oil producers. Colgan identifies eight, non-mutually exclusive causal mechanisms for how oil fuels international conflict, most of which are **implicitly exacerbated** by higher prices. They are: “(1) **resource wars**, in which states try to **acquire oil reserves by force**; (2) petro-aggression, whereby oil insulates aggressive leaders such as Saddam Hussein or Ayatollah Ruhollah Khomeini from domestic opposition and therefore makes them more willing to engage in risky foreign policy adventurism; (3) the externalization of civil wars in oil-producing states (“petrostates”); (4) financing for insurgencies—for instance, Iran funneling oil money to Hezbollah; (5) conflicts triggered by the **prospect of oil-market domination**, such as the U.S. war with Iraq over Kuwait in 1991; (6) clashes over control of oil transit routes, such as shipping lanes and pipelines; (7) oil-related grievances, whereby the presence of foreign workers in petrostates helps extremist groups such as al-Qaeda recruit locals; and (8) oil-related obstacles to multilateral cooperation, such as when an importer’s attempt to curry favor with a petrostate prevents multilateral cooperation on security issues.”

Though he doesn’t substantiate statistically that higher prices lead to more conflict through these channels, he implies it heavily. For example, he writes that, “the low oil prices of the 1990s have given way to higher and more volatile prices, increasing the magnitude of the consequences one can expect from oil-conflict linkages.”

While the emerging academic evidence may validate the claim that higher oil prices lead to more aggression, the historical and anecdotal evidence is somewhat mixed, and understandably so. Oil price is clearly only one of many inputs into foreign policy decision-making, and an indirect one at that. No leader thinks, “Now that oil is at $X, I’m going to invade my neighbor.” Context obviously matters, too: No one imagines that Ecuador or Norway is going to invade or try to blackmail a neighbor just because spot prices rise 15 or 30 percent in a given six-month period. Price levels seep into decision-making more subtly, affecting interlocking beliefs about strategic behavior generally and specific cases more particularly; they may fuel self-confidence by shoring up budget outlooks and funding the tools of more aggressive behavior in contexts where such behavior could conceivably make sense.

Moreover, there are many contravening (and occasionally countervailing) complications. Prominent among these is the fact that low oil prices can incentivize states to “wave the flag” in order to distract from domestic difficulties—so the impact of low oil prices might lead to more aggressive behavior in some cases. That suggests that neither high nor low prices per se may be the trigger affecting behavior, but rather notable changes in price that become politically salient in one way or another.

And there’s also the tricky issue of timing: Over what timeframe does increased oil revenue fuel aggression? Is it in anticipation of higher prices, in direct response to the current pricing levels, or is there more of a lag in effect as oil revenue slowly shores up—or is expected to shore up—budgets and military spending over time? The answer might depend on specific cases and leadership cadres.

There is also a scaling problem. If a 20 percent rise in oil prices makes a more assertive foreign policy more likely in a given country, does a 40 percent rise make it twice as likely? Or put differently, how much of a difference in price, and presumably in expected revenues, does it take to cross a threshold where it might have an impact on decision-making? Are there multiple thresholds?

Russia **exemplifies these issues**. Taking the same long view as George W. Bush in his interview, it seems self-evident that rising oil prices and higher government revenues over the course of the 2000s **gave Putin confidence**, funded military expansion and modernization, and helped enable Russia’s **most revanchist tendencies**. Between 2003 and 2013, **Russian military expenditure doubled** as the price of Brent crude rose from a low of around $20 a barrel in 2001 to a high of more than $140 a barrel in 2008. Russia, as the saying goes, is a gas station with nuclear weapons; a higher pump price thus means more weapons, nuclear and otherwise.

But when you cross reference this conclusion with specific acts of Russian aggression over the past roughly twenty years, the picture gets much more complicated. When Russia invaded **Georgia** in August 2008, oil was above $100 a barrel. Same with **Russia’s invasion of Crimea** in 2014. But Russia also dramatically intervened in Syria in September 2015, when oil had dropped to around $50 a barrel and the economy was sputtering due to both low energy prices and Western sanctions. Here, many analysts plausibly described these interventions as a way of rallying Russians to the flag and distracting them from domestic hardship. More likely, Putin saw an emergency in Syria that simply had to be dealt with, no matter the cost or risk; the Assad regime was in danger of collapsing, and Syria is Russia’s only ally offering ports and bases in the Mediterranean basin. So Russia is a bit of a mixed bag, but on balance its behavior—especially over a long timeframe—appears to support the thesis.

Saudi Arabia’s role in the 1973 Yom Kippur war also illustrates the tricky question of timing. Saudi funding of the effort was enabled by a financial buffer created by a rise in revenues from the late 1960s, and was likely justified by an expected rise in revenues due to an oil price increase that was anticipated, in part, because of the very war it was in the process of financing. Its reserves had already grown so large that, for the first time, Saudi Arabia could ride out a supply (and revenue) disruption and still finance a war. But the Saudis helped finance a war that they themselves did not participate in. So if rising oil prices led to greater interstate aggression, it did so in this case in a particularly indirect way.

These are all interesting and important nuances that attenuate any direct causal connection one might be tempted to draw between oil prices and conflict. So it would be nice to know if historical studies have shown any significant statistical relationship between fluctuations in key sources of government revenue (and what memoirs and archives tell us about how those situations were perceived) and interstate behavior. It would be even nicer to drill down into such studies to find cases where specific lucrative commodities—for example, European colonial profits such as from British opium sales in China, or cotton grown in Egypt—made any difference in the behavior of the relevant governments. Alas, such studies do not exist.

But regardless of the timeframe and mechanism, academic and historical studies alike do suggest that higher oil prices have generally lead to more aggressive, or at least riskier, behavior in recent decades—whether in anticipation of higher prices, immediately in their wake, or only after sufficient revenue stores are built up.

So are we at a point in the energy price cycle where, all else equal, we should expect greater interstate conflict? We’re close to Hendrix’s $77 a barrel threshold, above which oil-exporters are significantly more dispute-prone than non-oil exporters. But given the nuances just described, this specific price threshold is probably too cute. The more realistic argument to make is about the effect of a higher-price vs. lower-price paradigm over a multi-year horizon (particularly in light of the timing issue and potential lag). And if the period of the past two years (when Brent largely hovered between $40 and $60) was a lower-price paradigm, 2018-19 is potentially gearing up to be a higher-price paradigm driven by continued supply cuts by OPEC, tight global inventories, and—in a coincidental way—heightened geopolitical risks. We’ll see how these factors play out, but if oil prices remain elevated we may begin to subtly feel their effects on behavior by Iran, Saudi Arabia, Russia, and perhaps others.

None of this is to say that oil prices are the most important factor in the geopolitical outlook over the near, medium, or long-term. The reputed hawkishness of Mike Pompeo and John Bolton, the effect of the upcoming mid-term elections on Trump’s decision-making, and reactions to potential exogenous shocks (for example, a major clash in Syria between U.S. or Israeli and Iranian or Russian forces) will play a much more direct and important role in shaping the geopolitical landscape. But a higher oil price regime (if it holds) could well make petrostates like Iran, Saudi, and Russia more aggressive—either in **challenging the United States and Europe** in the case of Russia, or by exacerbating ongoing proxy conflicts in and around the Middle East in the cases of Iran and Saudi Arabia. Given these and other dynamics, we should expect a bumpy ride ahead.

### 1AC---Climate Change

#### Contention 2 is CLIMATE CHANGE.

#### We aren’t meeting climate goals.

Nunes '24 finds [Ashley Siefert Nunes; Climate and Energy Media Manager; 10-24-2024; "New Scientific Report Confirms World Leaders Failing to Meet Climate Goals, With Rich Nations Causing Greatest Harms"; Union of Concerned Scientists; https://www.ucs.org/about/news/new-scientific-report-confirms-world-leaders-failing-meet-climate-goals-rich-nations; accessed 03-11-2025] leon

WASHINGTON—The United Nations Environment Programme (UNEP) released its annual emissions gap report today. According to this latest analysis, **global heat-trapping emissions have yet to peak, and the world is on track to endure global average temperatures that rise between 2.6 and 3.1 degrees Celsius** above pre-industrial levels based on nations’ current emission reduction pledges, **far exceeding the Paris Agreement temperature goals**.

As with other recent scientific studies, **this report raises alarm about the disconnect between the science-based goals of the Paris climate agreement and both the pledges countries have made to rein in heat-trapping emissions** and the policies they have implemented thus far to achieve those commitments. Scientific agencies around the globe are already forecasting that **2024 will be deemed the hottest year on record**, continuing a trend of rising global average temperatures.

**Below is a statement by Dr. Rachel Cleetus, the policy director and a lead economist in the Climate and Energy Program at the Union of Concerned Scientists** (UCS). **She has more than 20 years of experience working on international climate and energy issues** and is a regular attendee of the annual U.N. climate talks. Dr. Cleetus will be attending this year’s negotiations, also called COP29, taking place next month in Baku, Azerbaijan, just after the U.S. presidential election.

“**This report forcefully confirms that nations’ efforts to cut heat-trapping emissions have been grossly insufficient to date**. Global heating records are being topped year after year, and people and ecosystems worldwide are suffering the devastation of unrelenting climate change disasters and increasingly irreversible impacts. To put it bluntly, **decades of inadequate action have put the 1.5 degrees Celsius goal further out of reach and world leaders are failing their people**. The consequences are profound—but **the policy choices decided now are as crucial as ever to limit future harm**.

#### Fortunately, nuclear energy offers an effective solution.

Hansen '13 confirms [James E. Hansen; PhD, American adjunct professor; Pushker A. Kharecha; PhD, Climate scientist; 03-15-2013; "Prevented Mortality and Greenhouse Gas Emissions from Historical and Projected Nuclear Power"; ACS; https://pubs.acs.org/doi/10.1021/es3051197; accessed 03-10-2025] leon

In the aftermath of the March 2011 accident at Japan’s Fukushima Daiichi nuclear power plant, the future contribution of nuclear power to the global energy supply has become somewhat uncertain. Because nuclear power is an abundant, low-carbon source of base-load power, it could make a large contribution to mitigation of global climate change and air pollution. **Using historical production data, we calculate that global nuclear power has prevented an average of 1.84 million air pollution-related deaths and 64 gigatonnes of CO2-equivalent** (GtCO2-eq) **greenhouse gas** (GHG) **emissions that would have resulted from fossil fuel burning**. On the basis of global projection data that **take into account the effects of the Fukushima accident, we find that nuclear power could additionally prevent an average of 420 000–7.04 million deaths** and 80–240 GtCO2-eq emissions due to fossil fuels by midcentury, depending on which fuel it replaces. By contrast, we assess that **large-scale expansion of unconstrained natural gas use would not mitigate the climate problem and would cause far more deaths than expansion of nuclear power**.

#### For example,

Maguire '24 reports [Gavin Maguire; Global Energy Transition Columnist; 09-19-2024; "Georgia's new nuclear plants drive US power sector clean-up"; Reuters; https://www.reuters.com/business/energy/georgias-new-nuclear-plants-drive-us-power-sector-clean-up-maguire-2024-09-19/; accessed 03-11-2025] leon

**From 2018 through 2022, the Vogtle site generated an average of 2,813 gigawatt hours** (GWh) of electricity a month **for the state of Georgia**, around **27% of total state electricity supplies according to Ember**.

**Since Vogtle 3 started operations in April 2023, that generation total rose to an average of around 3,500 GWh a month**, and climbed to over 4,600 GWh in May 2024, when Vogtle 4 first started operating.

CHANGING MIX

The sharply higher production from nuclear reactors has impacted Georgia's electricity mix in several key ways.

Firstly, **the share of generation from nuclear reactors jumped to 37% in May** - **a full 10 percentage point above the long-term average** - **as the Vogtle 4 plant came online**.

Secondly, the state's overall electricity generation total climbed to new highs as more nuclear generation was added to the output from other sources.

During the January to May period, Georgia's total electricity generation was 55,634 GWh, which was a record for that period and marked a 12.3% jump from the same months in 2023, Ember data shows.

Thirdly, the higher level of nuclear generation also boosted Georgia's total clean electricity output levels, which exceeded generation from the state's fossil fuel assets during March, April and May of this year for the first time on record.

Clean power's share of the Georgia generation mix was a record 47% for the January to May period, and compares to 41.5% during the same months a year ago.

Sustained output from Vogtle 3 and 4 over the remainder of 2024 could help push the clean power share of the overall mix closer to 50%.

WIDER IMPACT

**Vogtle's full ramp-up was also evident farther afield, with the carbon intensity of power production of the Southern Company Services power system dropping by 14% so far in 2024 from 2023's average** levels.

#### Thus, more investment is key.

Fisher '24 reports [Matt Fisher; Reporter at the IAEA Department of Nuclear Energy; 10-18-2024; "New IAEA Report on Climate Change and Nuclear Power Focuses on Financing"; International Atomic Energy Agency; https://www.iaea.org/newscenter/news/new-iaea-report-on-climate-change-and-nuclear-power-focuses-on-financing; accessed 03-07-2025] leon

According to the report, **global investment in nuclear energy must increase to 125 billion USD annually, up from the around 50 billion USD invested each year** from 2017-2023, **to meet the IAEA’s high case projection for nuclear capacity in 2050**. **The more aspirational goal of tripling of capacity**, which more than 20 countries pledged to work towards at COP28 last year, **would require upwards of USD 150 billion in annual investment**.

#### Historically, investment has been effective.

Freebairn '24 continues [William Freebairn; Reporter for S&P Global; 05-15-2024; "Layers of IRA tax credits boost nuclear energy's economics, drive uprate interest"; S&P Global; https://www.spglobal.com/commodity-insights/en/news-research/latest-news/electric-power/051524-layers-of-ira-tax-credits-boost-nuclear-energys-economics-drive-uprate-interest; accessed 03-06-2025] leon

**The US Inflation Reduction Act has provided multiple avenues for nuclear plant operators to benefit**, with some options to layer multiple credits and even sell the credits for more rapid profits, industry officials said May 14.

The IRA, passed in 2022, **contains a series of credits for clean energy, many of which can apply to nuclear energy in some way**, speakers at two panel sessions at the Nuclear Energy Institute's policy conference said in Washington.

**The IRA's passage has dramatically reversed the fortunes of nuclear operators, especially those in competitive power markets**, noted David Brown, senior vice president of federal affairs at **Constellation, the largest US nuclear plant operator by capacity**. **The IRA was** "**transformational**" **for the company, he added**.

For the 10 years prior to the IRA's passage, **Constellation had sought federal and state support to keep nuclear units from retiring prematurely**, and had implemented a hiring freeze as it planned to shut four reactors, Brown said. **With the security provided by the IRA, the company has hired 3,000 workers and is planning to renew the operating licenses of all of its 23 reactors**, he said.

**The IRA includes various tax credits that can apply to nuclear operators**, said Matt Crozat, the Nuclear Energy Institute's executive director of strategy and policy development. Operating plants are eligible for a production tax credit of up to $15/MWh, while new nuclear capacity can choose between a PTC of $30/MWh or an investment tax credit of 30%. **The investment tax credit can rise to as much as 50% if nuclear projects include sufficient domestic content** and are built in former coal plant communities, Crozat added.

Capacity increases at existing nuclear plants qualify as new capacity and owners can elect the PTC or ITC, speakers said. This has triggered a resurgence of interest in such uprates, several noted.

**Constellation has said up to 1,000 MW of additional nuclear capacity could be obtained from its fleet in coming years through uprates**, while NEI President and CEO Maria Korsnick said in a speech at the conference May 14 that **2.5 GW of capacity across the US could be added at existing nuclear plants via uprates**.

#### Our opponents may talk about renewables, but

Snyder '23 writes [Van Snyder; Spent 53 years as a mathematician, Engineer at Caltech; 03-16-2023; "Five Myths About Nuclear Power"; Substack; https://vsnyder.substack.com/p/five-myths-about-nuclear-power; accessed 02-19-2025] leon

**A 2009 MIT study concluded that nuclear power plants could be built for $4 per watt, and produce electricity for 6¢ per kWh**. Reactors under construction in Finland and Sweden cost about $7.50 per watt; ones in China cost $1.50 per watt. Delays due to lawsuits, difficulty certifying a new reactor, and licensing in an ever-changing regulatory environment add significant cost, especially interest on capital. It would be helpful if the Nuclear Regulatory Commission were to adopt the French system of licensing reactor designs, instead of individual reactors.

**The operating cost of a reactor is quite low because fuel cost is low**. Using $30/lb for uranium ore and 4.5% enrichment, **the contribution of the cost of uranium to the price of electricity is 0.116¢ per kilowatt hour** (kWh). This was the origin of Lewis Strauss’s infamous '“too cheap to meter” quip, which ignored all other costs. **Reducing oxide to metal, enriching the concentration of the fissile isotope (U-235) from the natural state of 0.7%, to 5%, and fabricating fuel assemblies, increase the fuel price to 0.5¢ per kilowatt hour**. Economic details are explained in Chapter 13 of Plentiful Energy.

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The lowest-cost electricity in California, 5¢ per kWh, is produced by the Diablo Canyon Nuclear Generating Station. Fixed cost amortization over the life of the facility contributes 74%, or 3.7¢ per kWh. Labor and other non-fuel recurring costs are 0.8¢ per kWh. The average California delivered electricity price is 30¢ per kWh.¶ The 3.3 GWe Palo Verde nuclear generating station in Arizona was constructed for $1.79 per watt. Its delivered price for electricity is 4.3¢ per kWh. It is the most profitable electric utility in the U.S.¶ Waste disposal is incorrectly cited as a social cost not internalized in the pricing structure. Since 1981, utilities had been paying 0.1¢ per kWh into the Federal Nuclear Waste Disposal Fund for this purpose, until a Federal court ruled in 2013 they no longer needed to pay because the Department of Energy had reneged on its legal responsibility to take custody of spent fuel. It was included in the rate customers paid. The fund now stands at $43 billion. Nuclear power is the only industry that fully internalizes all costs!¶ Another factor sometimes cited is subsidies. Federal subsidies for light-water reactors are larger than subsidies for gas or hydro generation, but substantially less than for wind or solar photovoltaic (PV).¶ State and local subsidies vary. The additional California solar PV subsidy is 40% of the Federal subsidy.¶ The first full-scale instance of any new system is always expensive, but both construction and operating costs always decrease with experience. A 300 MWe IFR-type reactor could be built for less than $8 per watt. A GE/Hitachi consortium estimates they could build 380 MWe modular instances called S-PRISM (Super Power Reactor Innovative Small Modular) for less than $2 per watt, if they were to have a stream of orders that is sufficiently secure to justify a factory to construct essentially identical ones, instead of building each one, subtly different from any other, on site.¶ In Conceptual Design of a Pilot-Scale Pyroprocessing Facility, Argonne National Laboratory and Merrick & Company proposed a forty hectare $398 million pilot-scale pyroelectric refining facility to process 100 tonnes per year of any type of spent fuel, a small fraction of the cost of a PUREX facility. Operating cost would be 0.05¢/kWh. Because utilities paid into the Federal Nuclear Waste Disposal Fund, and because Yucca Mountain has been canceled, this facility and similar larger-scale facilities ought to be constructed using those funds, not funded as part of the construction of new reactors, and not from the general fund of the Federal treasury — but the Nuclear Waste Disposal Act prohibits using the funds for reprocessing.¶ If the goal of modernizing the energy sector is to reduce or eliminate carbon dioxide (CO2) emissions, comparison to fossil fuels is irrelevant. Several scientists calculated that the only renewable source that can in principle provide all current energy usage is solar. Wind cannot provide more than about 15% of current total energy usage, which will surely increase (and wind won't). Conservation and all other schemes, alone or together, are inadequate to close the gap between wind supply and energy demand.

<<LINE BREAKS CONTINUE>>

**Solar PV panels cost about $3 per peak installed watt of label capacity**. Setting aside their inability to destroy spent nuclear fuel, it seems attention ought to focus on them instead of new designs of nuclear reactors. **The amount of electricity produced in a year, divided by the amount that would be produced if the system ran continuously at full label power output, is the capacity factor**. **The Department of Energy reported that the 2018 national average capacity factor for solar PV was 25%**. **Nuclear generating stations averaged 92.5%**. **With a 25% capacity factor, the cost of a solar panel**, at $3 per peak watt, **is $12 per average watt, about six times the expected cost of S-PRISM modules**.

Solar panels last about 25 years, but must operate more than four years to repay the energy invested in their fabrication, deployment, and recycling. The capital cost of $12 per average watt, amortized over twenty-five years at 5%, deducting the four-plus year energy payback period, is $26.61 per watt of average capacity.

The capital cost for solar PV panels does not include operating and maintenance costs, electricity storage, significant grid changes necessary to exploit diffuse sources, and recycling.

Several independent studies have determined that **renewable sources would need 390-800 watt-hours' storage per average watt of demand to provide firm power**, for which the industry definition is 99.97% availability. In Adequate Storage for Renewable Energy is Not Possible, using twelve years of data for California, I calculated that more than 2,800 watt-hours’ storage per watt of average demand would be necessary. Using five years of nationwide data, more than 800 watt-hours’ storage per watt of average demand is necessary. The May 2020 price for Tesla PowerWall 2 batteries was $0.543, not including installation. The warranty period is ten years. For 800 watt-hours, **the total cost would be more than 3.8 times total USA GDP every year**, for batteries alone, or “only” $49,000 per month for each of America’s 128 million households. **These amounts of storage will be entirely inadequate the next time Mount Tambora erupts and produces another** “**year without a summer**” such as 1816. This or something similar will happen again. The only question is “when?”

**These sorts of calculations never appear in arguments that renewable electricity is less expensive than nuclear power**.

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It leads to nuclear weapons proliferation (no it doesn't)¶ In a March 2017 Scientific American interview, John Holdren, President Obama's Science Advisor, said “… breeder reactors… [require] what amounts to a plutonium economy… and trafficking in large quantities of weapons-usable material.”¶ A plutonium economy unrelated to breeder reactors already exists. The often-repeated hyperbole ”trafficking in large quantities of weapons-usable material” is nonsense.¶ Spent fuel from a British municipal reactor was used to make a nuclear explosion. The yield was a fraction of the Hiroshima weapon, which was a much simpler uranium device. The British remarked “We will not try that again.”¶ If plutonium is less than 93% isotopically and chemically pure Pu-239, explosive yield decreases rapidly. In an IFR-type system, plutonium in spent fuel never contains more than 54% Pu-239, and is never more than 40% chemically pure. Separating isotopically pure Pu-239 from spent fuel presents a much more difficult problem than for uranium. Plutonium isotopes in spent fuel, other than Pu-239, emit 50 times more heat, 5,000 times more neutrons, and 100 times more gamma radiation. This could damage a weapon or cause predetonation, and makes maintenance of fine mechanical tolerances difficult. Expensive remote assembly is mandatory. A 1994 Lawrence Livermore National Laboratory study stated “spent IFR fuel cannot be used to make a nuclear weapon without significant further processing.” No one makes weapons from spent fuel because it is the most difficult substance from which to do so.¶ Producing isotopically pure plutonium directly in a reactor requires controlling the neutron energy more precisely than is practical in a municipal reactor, and irradiating the fuel for durations far shorter than would be economical. Even the most rudimentary inspection regime would detect this. If an inspection regime is not practical in rogue states, don't sell them reactors, spent fuel, or means to reprocess fuel.¶ Even if truly “weapons-ready” material existed, the proliferation argument is a red herring. No country's nuclear power stations or fuel reprocessing affect any other country's desires, decisions, or ability to acquire nuclear weapons. On-site reprocessing implies very few opportunities for diversion or theft. Plutonium in spent fuel in an IFR-type system is in a highly-radioactive and therefore easily monitored state. Advanced industrial economies already have nuclear weapons, or have the means to make them much more effectively than from spent municipal reactor fuel. Only a fast-neutron reactor can consume all fissionable metals in spent fuel and decommissioned weapons.¶ There isn't enough uranium (there's plenty)¶ The Australian Uranium Association estimated that it is economically feasible at current prices to recover about 4.5 million tonnes of uranium. Known or projected reserves of lower quality increase the estimate to 18.5 million tonnes. Activists insist an all-electric Earth would demand about 15,000 GWe. Using the one tonne per GWe-year rule of thumb, 18.5 million tonnes is enough to satisfy this demand, if it were used with 100% efficiency, for only about 1,200 years. But today’s reactors use only 0.6% of the energy in mined uranium, so this fuel would last less than ten years. The situation isn't nearly so bleak, however.¶ In the United States, there are about 90,000 tonnes of 5%-used fuel, and about 900,000 tonnes of depleted uranium left over from enriching mined uranium. A 1,700 GWe all-electric U.S. energy economy could be powered by this “waste” in fast-neutron reactors for 525 years, or longer depending upon use of renewable sources, without mining, milling, refining, enriching, or importing one gram of new uranium. Spent fuel is significantly more radiotoxic than depleted uranium, so it should be consumed first. Every country that has nuclear reactors has stocks of spent fuel and depleted uranium.¶ IFR-type reactors extract 99.99% of the energy immanent in mined uranium but today's reactors extract only 0.6%. The price of uranium would contribute the same amount to the delivered electricity price from IFR-type reactors if it were to increase 167 fold. Uranium could be economically extracted from lower quality ores, or from seawater, where there is estimated to be at least a thousand times more than could be extracted from land. Another low-quality ore is coal-fired power plant waste, which contains nineteen times more energy in the form of uranium and thorium than was extracted by burning the coal. Thorium, four times more common than uranium, can be converted to fissile fuel by neutron transmutation in a fast-spectrum reactor.¶ Nuclear fission is an effectively inexhaustible source of energy.¶ It is possible to breed about 5% more fuel from uranium than is consumed, but only about 1% more from thorium. If the goal is to deploy a fleet of new breeder reactors fueled only by recycled fuel, thorium should not be used before sufficient reactors are in service.¶ The first two goals of the IFR project were safety and waste mitigation. The third was fuel economy.¶ The system problem¶ Most energy discussions focus only on components — wind turbines and solar panels.¶ Electricity production and distribution is a system problem, not simply a component problem.¶ In Burden of Proof: A comprehensive review of the feasibility of 100% renewable-electricity systems, Renewable and Sustainable Energy Reviews 76, Elsevier (2017), pp 1122-1133, Ben Heard et al described an analysis of 24 studies that claimed to explain how to construct and operate regional, national, or continental-scale electricity systems. None of the studies described systems that were physically feasible. Heard et al concluded there was no point to study economic viability.

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**A more serious system problem is that the Earth does not have sufficient materials to build the** “**technology units**” **that the International Energy Agency** (IEA) **demands be built to provide all energy from renewable sources**. To stay out of the weeds, here is just one problem: **Five times more copper is needed than is known to exist on the Earth in forms that can be recovered**.

#### Absent action,

Cassella '23 concludes [Carly Cassella; Senior Journalist at Science Alert; 08-30-2023; "Scientists Warn 1 Billion People on Track to Die From Climate Change"; Science Alert; https://www.sciencealert.com/scientists-warn-1-billion-people-on-track-to-die-from-climate-change; accessed 03-11-2025] leon

If the world reaches temperatures 2°C above the average global preindustrial temperature, which is what we are on track for in the coming decades, then that's a lot of lives lost. **For every 0.1 °C degree of warming from now on, the world could suffer roughly 100 million deaths**.

# 2AC

### Overview

**Green paradox is wrong.**

**Carins ’19** [Robert; Professor @ McGill University, PhD from the Massachusetts Institute of Technology; September; JSTOR; “The Green Paradox, A Hotelling Cul de Sac,” https://www.jstor.org/stable/26780611; DOA: 3-25-2025] tristan

The researcher’s dilemma is that, to construct a general equilibrium model with an endogenous price, one has to abstract from a fundamental property of production and hence of that equilibrium. We have chosen to retain the fundamental property and to wring as much as possible from a partial equilibrium analysis. Our model shifts attention from temporally smooth, convex decisions about the flow of aggregate production to lumpy, irreversible decisions that create specific, persisting limits to flows from distinct reserves. Extraction is perceived as an industrial rather than a consumptive activity. Producers cannot increase production at will. They produce at a capacity that is predetermined by sunk investment and diminished by natural decline. Any increase in production requires sinking a further investment. The incremental discounted net cash flows must pay back that investment. The analytically important notion is net present value, not the rate of cash flow: Decisions are made on several margins, but not on the basis of the ratios of net cash flows.

The single reserve is the locus of decisions for the production of oil. Each reserve has its own level of development and decline parameter. Whatever its tilt, a unit tax has qualitatively strong effects, namely, lower investment and initial production, reduced net present value, delays and reductions in enhanced recovery, and, in most cases, reduced discounted carbon damages and reduced overall recovery. Contrary to the underlying vision of the green paradox, the “tilt” of output from an oil reservoir (and hence in the aggregate) is equal to the rate of natural decline of the reserve, which depends on the tax only through the initial investment.

The incentive to reduce initial investment is stronger for a decreasing tax than an increasing tax. On the other hand, an increasing tax discourages investment in enhanced production, thereby further reducing the total level of output from the reserve as well as the length of production. Dynamic arbitrage is clear in the results for enhanced production and to an extent for the announcement effect. Stressed here is the choice of capacity, because it determines the level of output and because of the predictions of the green paradox.

The aggregation of decisions and the endogenous equilibrium price path in Hotelling analyses result from oversimplification. In the study of the green paradox, questions of comparability among reserves and of levels of tax effort for different tilts of the tax and different qualities of reserve are neglected. In our model the putative sectoral equilibrium involves the outcomes of decisions at tens of thousands of heterogeneous developed and undeveloped reserves and undiscovered resources. There is in fact no set of parameters among the many background variables that can be held fixed in order to make the scenarios comparable. Even though the firms are considered to be price takers, simulating the equilibrium would involve heroic assumptions about policy making and about the physical and economic characteristics of undiscovered reserves. Common assumptions, such as that marginal costs are equalized across reserves or that all discovered reserves are in production, do not hold. Discerning sectoral effects, including market prices and total emissions, is mathematically untenable and requires general economic reasoning.

### Disads

#### 1. **Nuclear energy stops extractivism.**

Wang '24 [Seaver Wang; Director of the Climate and Energy Team; 05-23-2024; "It's Settled, More Nuclear Energy Means Less Mining"; The Breakthrough Institute; https://thebreakthrough.org/issues/energy/its-settled-more-nuclear-energy-means-less-mining; accessed 03-22-2025] //JZ

**That debate is now settled**. **When considering how to best manage the mining footprint of a global shift to low-carbon energy, the math clearly shows that clean energy systems using relatively more nuclear energy will impose fewer mining impacts** than systems using only solar, wind, and storage. A major research report from my team, building on recent U.S. National Renewable Energy Laboratory, MIT, and United States Geological Survey analyses, finds that **every unit of clean electricity from a nuclear power plant requires excavating just 30% or 23% the mass of rock and metal, compared to an equal unit of solar or onshore wind electricity**.

#### 2. The alternative is worse.

McCracken ‘12 [Garry, Ph.D. in Solid State Physics and Lecturer – Culham Plasma Physics Summer School, and Peter Stott, European Coordinator – ITER and Ph.D. in Theoretical and Experimental Plasma Physics – Manchester University, Fusion: The Energy of the Universe, https://www.files.ethz.ch/cepe/2011TermPapers/p58.pdf; p. 198-199; accessed 03-25-2025]

If coal is used as the main energy supplier, which is still largely available on the planet, the energy problem is solved, isn't it? The problem with coal is that the CO2 and sulfur emissions are tremendous, if the world population would use this form of energy. What **most people don't know is that burning coal does not produce any new radioactivity, but coal does contain uranium, which is released in the environment when coal is burned**. This concentration of uranium in coal is really small but when 3.5 million of tons of coal are burned for a typical industrial city. **It will release an amount of 5 tons of uranium in the environment**. **This is in fact more uranium than when the electricity would come from a fission reactor**. So this means that coal is almost the world's worst enemy when it comes to supplying energy. This is in the contrary to fusion energy, with fusion energy there are no CO2 emissions only helium is the waste product of a fusion reaction. **The raw materials necessary for the fusion fuel are lithium and water, which are completely nonradioactive**. **There is enough lithium to last for at least tens of thousands of years and enough deuterium in the oceans to be truly inexhaustible**.

#### 3. Transition is inevitable, but speed is key.

Joselow ’23 [Maxine Joselow; Reporter @ the Washington Post; 10-24-2023; “The clean-energy transition is ‘unstoppable,’ IEA says”; Washington Post; https://www.washingtonpost.com/politics/2023/10/24/clean-energy-transition-is-unstoppable-iea-says/; accessed 03-24-2025] tristan

**The clean-energy transition may be inevitable, but may not happen fast enough**, IEA says

**Ten times as many electric vehicles on the roads worldwide**. **Solar panels generating more electricity than the entire U.S. power system**. **Electric heat pumps outselling fossil fuel** boilers globally.

These climate-friendly scenarios might sound like a pipe dream, but they are likely to materialize within the next decade, as humanity rapidly shifts to renewable energy to avert the worst impacts of global warming, the world’s leading energy agency said today.

The flagship annual report from the International Energy Agency, dubbed the World Energy Outlook, offers a rosy prediction of the growth of clean-energy technologies around the world. It portrays the decline of fossil fuels, the main driver of rising global temperatures, as all but inevitable.

“**The transition to clean energy is happening worldwide and it’s unstoppable**,” IEA executive director Fatih Birol said in a statement. “**It’s not a question of** ‘**if**’, **it’s just a matter of** ‘**how soon**’ — and **the sooner the better for all of us**.”

The findings come despite steep challenges facing the energy sector, including wars in Ukraine and Gaza that have roiled global oil markets. Paradoxically, they also coincide with decisions by oil giants to double down on fossil fuels for decades to come.

The findings

The IEA envisions green technologies such as solar panels, wind turbines and electric cars taking off in the coming years, thanks to both supportive governmental policies and market forces. By 2030, it predicts:

Renewables' share of the global electricity mix will approach 50 percent, up from around 30 percent today.

Three times as much investment will flow to offshore wind projects as to new coal- and gas-fired power plants.

**The share of fossil fuels in the global energy supply will fall to 73 percent, down from about 80 percent today**.

**Still, demand for fossil fuels will remain too high for humanity to meet the goal of the Paris climate accord**: limiting global temperature rise to 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial levels, the report says. On the supply side, the United States is churning out record amounts of oil.

#### 4. If they make a ‘pre-fiat’ claim, they can’t access it. Representations don’t shape reality.

Resnick ‘17 [Brian Resnick; science reporter for Vox; 2017; "7 psychological concepts that explain the Trump era of politics"; Vox; https://www.vox.com/science-and-health/2017/3/20/14915076/7-psychological-concepts-explain-trump-politics; accessed 11-10-2024] leon

In fact, studies show the exact opposite: **The more informed people are about politics, the more likely they are to be stubborn about political issues**.

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This concept is related to motivated reasoning, but it’s important enough to warrant its own consideration. It shows how motivated reasoning becomes especially stubborn and ugly when it comes to politics.¶ “People are using their reason to be socially competent actors,” says Dan Kahan, a psychologist at Yale, and one of the leading experts on this phenomenon. Put another way: We have a lot of pressure to live up to our groups’ expectations. And the smarter we are, the more we put our brain power to use for that end.¶ In his studies, Kahan will often give participants different kinds of math problems.¶ When the problem is about nonpolitical issues — like figuring out the whether a drug is effective — people tend to use their math skills to solve it. But when they’re evaluating something political — let’s say, the effectiveness of gun control measures — the trend is that the better participants are at math, the more partisan they are in their responses.¶ “Partisans with weak math skills were 25 percentage points likelier to get the answer right when it fit their ideology,” Ezra Klein explained in a profile of Kahan’s work. “Partisans with strong math skills were 45 percentage points likelier to get the answer right when it fit their ideology. The smarter the person is, the dumber politics can make them.”¶ And it’s not just for math problems: Kahan finds that Republicans who have higher levels of science knowledge are more stubborn when it comes to questions on climate change. The pattern is consistent: The more information we have, the more we bend it to serve our political aims. That’s why the current debate over “fake news” is a bit misguided: It’s not the case that if only people had perfectly true information, everyone would suddenly agree.¶ So think of that when you hear politicians or pundits talk shop: They know a lot about politics, but they’re bending what they know to fall in line with their political goals. And they probably don’t realize they are doing this and can feel confident in their partisan conclusions because they feel well informed.¶ 3) Evolution has left us with an “immune system” for uncomfortable thoughts.¶ There’s a reason why we engage in motivated reasoning, a reason why facts often don’t matter: evolution.¶ Critical thinking and reasoning skills evolved because they made it easier to cooperate in groups, Elizabeth Kolbert explains in a recent New Yorker piece. We’ve since adapted these skills to make breakthroughs in topics like science and math. But when pressed, we default to using our powers of mind to get along with our groups.¶ Psychologists theorize that’s because our partisan identities get mixed up with our personal identities. Which would mean that an attack on our strongly held beliefs is an attack on the self.¶ “The brain’s primary responsibility is to take care of the body, to protect the body,” Jonas Kaplan, a psychologist at the University of Southern California, says. “The psychological self is the brain’s extension of that. When our self feels attacked, our [brain is] going to bring to bear the same defenses that it has for protecting the body.”¶ It’s like we have an immune system for uncomfortable thoughts.

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Recently, Kaplan has found more evidence that we tend to take political attacks personally. **In a study recently published in Scientific Reports, he and collaborators took 40 self-avowed liberals who reported having “deep convictions,” put them inside in a functional MRI scanner, and started challenging their beliefs**. Then they watched which parts of the participants’ brains lit up.

**Their conclusion: When the participants were challenged on strongly held beliefs, there was more activation in the parts of the brain that are thought to correspond with self-identity and negative emotions**.

4) **The argument that’s most convincing to you is not convincing to your ideological opponents**

#### 5. Using the United States does not endorse its legitimacy.

Newman ’10 — Saul; Reader in Political Theory at Goldsmiths. 2010; U of London; Theory & Event; Volume 13; Issue 2; https://toleratedindividuality.wordpress.com/wp-content/uploads/2015/12/the-politics-of-postanarchism-by-saul-newman.pdf

There are two aspects that I would like to address here. Firstly, the notion of demand: **making certain demands** on the state – say for higher wages, equal rights for excluded groups, to not go to war, or an **end to draconian policing** – is one of the **basic strategies** of social movements and radical groups. Making such demands does **not necessarily mean working within the state** or **reaffirming its legitimacy**. On the contrary, demands are made from a position **outside the political order**, and they often exceed the question of the implementation of this or that specific measure. They implicitly **call into question the legitimacy** and even the **sovereignty of the state** by highlighting fundamental inconsistencies between, for instance, a formal constitutional order which guarantees certain rights and equalities, and state practices which in reality violate and deny them.

### SetCol

the aff phases out oil ---the neg means that they perpetuate oil violence and war causes colonialism? Progress is possible – they choose not to take it

### Prolif

**First administration disproves.**

**Martucci ’24** [Brian Martucci, writer and editor specializing in commercial real estate, energy and the environment. 11-8-2024, “Nuclear sector’s views on second Trump administration mixed as Rogan interview raises questions”, Utility Dive, https://www.utilitydive.com/news/nuclear-energy-sector-mixed-views-second-trump-administration-joe-rogan/732407/, doa 3-25-2025] //ALuo

“We should have no subsidies … all the companies should internalize their costs in the way that they internalize their profits,” Kennedy told Tesla CEO and fellow Trump backer Elon Musk in an online discussion last year.¶ But the **first Trump administration** was **broadly supportive** of the U.S. **nuclear industry**. It provided **billions** in **loan guarantees** to facilitate construction of Plant Vogtle units 3 and 4; supported the failed Carbon Free Power Project at Idaho National Laboratory, a proposed 462-MW plant that would have used NuScale’s small modular reactor technology; and advanced the pro-nuclear Partnership for Transatlantic Energy Cooperation, the Trump presidential campaign said in 2023.¶ In 2019, Trump **signed** the Nuclear Energy Innovation and Modernization Act, or **NEIMA**, which **paved the way** for the technology-neutral Part 53 advanced **reactor licensing pathway**. The NRC is expected to finalize Part 53 regulations by 2027.

**It's not topical – definition of domestic has to be IN THE US.**

**Oxford 02** [Oxford, 2002, “The Oxford Essential Dictionary of the U.S. Military,” Oxford Reference, https://www.oxfordreference.com/display/10.1093/acref/9780199891580.001.0001/acref-9780199891580-e-2447, doa 3/29/25] //ALuo

existing or occurring inside a particular country; not foreign or international: Korea's domestic affairs.domestically adv.late Middle English: from French ...domestically adv.late Middle English: from French domestique, from Latin domesticus, from domus ‘house.’ ...

**The aff is in the form of grants.**

**WNA 24** [WNA, 12-3-2024, "US Nuclear Power Policy", World Nuclear Association, https://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power-policy, doa 4-3-2025] //ALuo

Yet, the government remains more involved in commercial nuclear power than in any other industry in the USA. There are lengthy, detailed requirements for the construction and operation of all reactors and conversion, enrichment, fuel fabrication, mining and milling facilities. The review process preceding the construction of new reactors can take 3-5 years. The US government, through its own **national research laboratories** and **projects** at university and industry facilities, is the main source of funding for advanced reactor and fuel cycle research. It also promises to provide **incentives** for building **new plants** through loan guarantees and tax credits, although owners have to raise their own capital. US domestic energy policy is also closely linked to foreign, trade and defence policy on such matters as mitigating climate change and nuclear non-proliferation (of weapons).¶ The Nuclear Regulatory Commission (NRC) has reviewed nearly 20 applications for combined construction permit and operating licences (COLs) to build new nuclear reactors, as well as applications for design certifications for new reactor types. It also assesses power uprate requests and licence renewal applications. The NRC’s FY 2018 budget for oversight of the 99 operating power reactors was $937million. The budget includes nuclear materials and waste safety.¶ State and local governments also have a major impact on the framework and economics of the US nuclear power industry. Deregulation of electricity prices in some states in the 1990s led to greater concentration in nuclear power production. In 1976, a voter referendum in California led to a law that prohibited the construction of new nuclear plants in the nation's largest state and the prohibition still remains in effect. Opposition in the state of Nevada was a key factor in the decision by the new Democratic administration of Barack Obama in early 2009 to abandon the government's long-standing plans for a 70,000 tonne geological repository in that state for disposal of the high-level nuclear waste that has accumulated at reactor sites across the nation and which the federal government is responsible for (see section below).¶ Energy Policy Act 2005¶ After much preliminary debate, the Energy Policy Act (EPA) 2005 comfortably passed both houses (74-26 in the Senate and 275-156 in the House). It included incentives for the domestic nuclear power industry, including:¶ Production tax credit (PTC) of 1.8 ¢/kWh for the first 6000 MWe of new nuclear capacity in the first eight years of operation. Under the initial terms of the EPA, to qualify for the nuclear PTC, a plant must be in service on or before 31 December 2020, and the maximum value of the nuclear PTC is $6 billion over eight years (or £750 million per year). However in February 2018, an extension to the PTC was passed by the US Senate and Congress. The extension allows reactors entering service after 31 December 2020 to qualify for the tax credits, and allows the US Energy Secretary to allocate credit for up to 6000 MWe of new nuclear capacity which enters service after 1 January 2021. The PTC cannot be claimed until assets begin generating electricity, and is not inflation adjusted.¶ Federal risk insurance of $2 billion to cover regulatory delays in full-power operation of the first six advanced new plants.¶ Rationalised tax on decommissioning funds (some reduced).¶ Federal loan guarantees for advanced nuclear reactors or other emission-free technologies up to 80% of the project cost.¶ Extension for 20 years of the Price Anderson Act for nuclear liability protection.¶ Support for advanced nuclear technology.¶ Also $1.25 billiona was authorised for an advanced high-temperature reactor (Next Generation Nuclear Plant) to be built by 2021a at the Idaho National Laboratory, capable of cogenerating hydrogen. Overall more than $2 billion was provided for hydrogen demonstration projects. See later section on NGNP.¶ In 2006, it was spelled out that the 6000 MWe eligible for production tax credits would be divided pro-rata among those applicants which filed combined construction and operating licence (COL) applications by the end of 2008, which commence construction of advanced plants by 2014, and which enter service by 2021. The deadline may be removed in 2017 legislation.¶ In October 2007, the Department of Energy (DOE) announced that it would guarantee the full amount of loans covering up to 80% of the cost of new clean energy projects including advanced nuclear power plants under the 2005 EPA. The first round of loan guarantees went to renewable energy and advanced gas (e.g. integrated gasification combined cycle) projects, those for nuclear then still had to be authorised by Congress.¶ The Act also addressed climate change, requiring action on a national strategy to address the issue. In 2008, the USA emitted 5.8 billion tonnes of CO2 from energy use.¶ Federal loan guarantees for new plants (and renewable energy projects)¶ In mid-2008, the Department of Energy (DOE) invited applications for loan guarantees to support the construction of advanced nuclear power plants (up to $18.5 billion total) and uranium enrichment plants (up to $2 billion initially, but then $4 billion). A further $78.5 billion was offered for renewable energy projects, and $8 billion for 'clean coal'. Loan guarantees are to encourage the commercial use of new or significantly improved energy technologies and "will enable project developers to bridge the financing gap between pilot and demonstration projects to full commercially viable projects that employ new or significantly improved energy technologies."1, b They are a form of support that allows companies to finance debt at reduced rates.¶ Any preliminary approvals issued in 2010-11 were to be conditional upon the applicant receiving a combined construction and operating licence (COL) from the Nuclear Regulatory Commission, and in the event none were issued.¶ Applications were lodged in 2008, with a fee of $200,000 for the first part and $600,000 for the second part. The DOE received 19 initial applications from 17 utilities to support the construction of 14 nuclear power plants involving 21 new reactors of five different designs. The total capacity involved was 28,800 MWe. The total requested came to $122 billion, significantly more than the $18.5 billion offered. The aggregate estimated construction cost involved the 14 projects was $188 billion. The DOE also received two applications for enrichment plants, total $4 billion, against $2 billion initially on offer.¶ In the light of the interest shown and the fact that the scheme is borrower-funded, the industry called for the amount available for power plants to be increased to $100 billion. In February 2010, the Administration added $36 billion to its FY2011 budget proposal to expand the reactor part of the scheme to $54.5 billion, covering 6 to 8 projects involving up to 13 reactors of several different designs, but this ws not approved by Congress. In February 2011 the request was repeated for FY 2012, but was again refused. The FY 2013 budget proposal contained no such request. In the meantime, the DOE conditionally granted the applications for one project (Vogtle) and sought to increase the $8.3 billion sum available before October 2010 by $9 billion through other legislation, so that it could approve the other three shortlisted power plant applications involving five reactors. It offered a loan guarantee to Unistar for Calvert Cliffs, but Constellation rejected this due to the high costs imposed. The DOE issued $6.5 billion in loan guarantees to Georgia Power and to Oglethorpe Power for Vogtle, and subsequently $1.8 billion for MEAG Power. This was followed by $3.7 billion in March 2019, taking the total to $12 billion for Vogtle.¶ As time passes without further loan guarantees being granted, criticism of the program has been that it is too focused on **project-based financing** instead of the **corporate finance** that dominates nuclear projects. Also, DOE has faced opposition from other federal agencies, including the Office of Management and Budget, Department of Labor, and the Federal Financing Bank, which have brought the program for nuclear capacity to an effective standstill. In March 2013 the Government Accountability Office said that three nuclear applications totalling $8.3 billion were still being considered.¶ In August 2011 Solyndra, a company which designed, made and sold solar PV panels and had received a $535 million DOE loan guarantee, went into bankruptcy and laid off all employees. This plus high levels of government debt, clouded the prospects for further loan guarantees for energy projects.¶ Nevertheless, under the same program and within the $18.5 billion authorized, in December 2014 the DOE formally issued a solicitation for $12.6 billion loan guarantees for advanced nuclear energy projects, notably advanced nuclear reactors, small modular reactors, uprates and upgrades at existing facilities, and advanced nuclear facilities for the front end of the nuclear fuel cycle – $10.6 billion for reactors and $2 billion for front end of fuel cycle, notably enrichment. Applications were due by 18 March 2015. This was the fourth open solicitation from the department's loan program office, alongside solicitations for projects for advanced fossil energy, renewable and efficient energy, and advanced technology vehicle manufacturing.

**Energy programs make prolif less likely by increasing countervailing constraints.**

**Miller ’17** [Nicholas; Associate Professor in the Department of Government @ Dartmouth; November 1; MIT; “Why Nuclear Energy Programs Rarely Lead to Proliferation,” https://direct.mit.edu/isec/article-abstract/42/2/40/12176/Why-Nuclear-Energy-Programs-Rarely-Lead-to?redirectedFrom=fulltext, accessible at: https://sci-hub.ru/https://doi.org/10.1162/ISEC\_a\_00293; DOA: 3-23-2025] tristan \*\*brackets r og\*\*

How Nuclear **Energy** Programs **Restrain** **Proliferation**

As the conventional wisdom emphasizes, a nuclear energy program increases the technical capability of a state to build nuclear weapons. However, policymakers in states that favor nonproliferation—most prominently, the United States—have long been aware of this fact and have worked hard to weaken this linkage. As a result of their actions, a variety of **political** **restraints** have been put in **place** to **counterbalance** the **ability** of energy **programs** to make **proliferation** technically **easier**. The remainder of this section elaborates two such restraints.

higher likelihood of detection and nonproliferation pressure

States with **nuclear** energy **programs** face **increased** international **scrutiny** and therefore **pressure** **not** to **proliferate**. From the time a country announces its intention to build nuclear power reactors, the **possibility** of this being **cover** for a **weapons** **program** becomes **apparent**, particularly if the country is located in an unstable security environment. As Harold Feiveson wrote in 2009, “It is **well** **understood** that one of the **factors** leading several countries now without nuclear power programs to **express** **interest** in nuclear power is the **foundation** that such **programs** could **give** them to **develop** **weapons**.”35

Once a country formally launches a nuclear energy program, its **activities** are likely to **trigger** outside **intelligence** **gathering**, for three reasons: energy programs (1) involve **regular** **acquisitions** of material and technology from **foreign** **arms**, providing more **collection** **opportunities** for **intelligence** **agencies** and allowing the program to be **infiltrated**; (2) offer **observable** **targets**—such as reactors, research centers, and nuclear **scientists**—for intelligence **agencies** to **focus** **on**; and (3) generally come with **safeguards** on relevant **facilities**, either because of the recipient country’s membership in the NPT or **supplier** **requirements**. These factors do not make it impossible for a country to use an energy program to develop a nuclear weapons program, but they do make it more likely that the latter program will be detected. In monitoring nuclear energy programs and detecting nuclear weapons research, both national intelligence agencies and the IAEA play important and, increasingly synergistic, roles.36

International **scrutiny** is likely to be particularly **harsh**, both in the **media** and from **intelligence** **agencies**, when the energy program involves efforts to acquire enrichment or reprocessing facilities. After all, these are technologies required for **producing** missile materials for **bombs**, and enrichment and reprocessing programs are **hard** to **justify** economically for **small** nuclear energy **programs**.37 This sort of scrutiny explains the vigorous response of the United States to the proposed export of reprocessing and enrichment technology to Brazil, Iran, Pakistan, South Korea, and Taiwan in the 1970s—which in every case was publicly justified with reference to nuclear energy programs. In each, the United States was partially or entirely **successful** in **preventing** the **exports** or **increasing** **safeguards**, thus **complicating** the path to the **bomb** for the nuclear aspirants.38

States that **want** to **acquire** nuclear **weapons** while minimizing the chances of detection and nonproliferation pressure are likely **better** **off** adopting a more **covert** **approach**, **without** an **energy** program. As Scott Kemp has demonstrated, a country with relatively modest technological skills could indigenously build and operate gas centrifuges to produce highly enriched uranium. Such an operation would not require a nuclear reactor or an energy program, would produce virtually no technical signatures, and would therefore be relatively easy to conceal; indeed, most countries that developed gas centrifuges indigenously did so without being detected.39 Or, as Richard Rhodes has argued, “[T]here are **better**, **faster**, **surer**, **cheaper**, and secret **alternative** **means** to proliferation” than using **power** **reactors**.40 Such a “hiding” strategy, Vipin Narang argues, may permit a state to “present its development of nuclear weapons as a fait accompli,” allowing it to “reap all the benefits of a nuclear deterrent while avoiding the external duress of the proliferation process.”41 Although enrichment programs are easier to conceal than plutonium-based programs, either can be attempted secretly without a public energy program, as the cases of Israel, North Korea, and Syria illustrate. Even if a covert program is unlikely to remain secret to the point of acquisition, the aspiring proliferator may nonetheless seek to delay detection, thereby reducing opportunities for preventive action. Certainly elements of any nuclear weapons program are likely to be covert, including in countries using an energy program as cover. For example, a country pursuing nuclear weapons with an energy program is still likely to do weapons design work in secret, may build additional covert facilities based on technology in overt facilities, and might seek to secretly divert materials for use in weapons. Nonetheless, countries engaged in this kind of tactical secrecy display qualitative differences from those without energy programs that conceal all or most of their key nuclear facilities.

Several historical cases illustrate the viability of this more covert proliferation pathway. Following Israel’s attack on Iraq’s Osirak reactor in 1981, Iraq managed to acquire enrichment technology largely without the knowledge of the international community. As a result, Baghdad was likely only a few years away from achieving a rudimentary nuclear weapons capability when its nuclear program was dismantled in the aftermath of the 1990–91 Gulf War, which was not primarily a nonproliferation intervention.42 Interestingly, part of the reason U.S. intelligence officials underestimated Iraq’s program was be cause they wrongly assumed that Baghdad would follow the energy program route. A 1983 Central Intelligence Agency report found “no identifiable nuclear weapon program in Iraq” and judged that achieving a nuclear weapons capability by the 1990s “[would depend] critically on the foreign supply of a nuclear reactor—preferably a power reactor—of substantial size fairly soon.”43

By the time U.S. intelligence officials became convinced that North Korea was pursuing nuclear weapons in 1989,44 Pyongyang had already secretly constructed a reactor for plutonium production and begun work on a reprocessing facility.45 The United States first detected the construction of the reactor in 1982,46 two years after construction had begun.47 It was not until 1984, however, that Washington realized that it was a larger reactor better suited to plutonium production.48 When the United States was ultimately able to mobilize international action against North Korea in 1992, IAEA analysis concluded that North Korea had probably already produced enough plutonium for one or two bombs.49 Finally, without the cover of a nuclear energy program, Israel was able to secretly build a reactor and reprocessing facility with French help starting in the late 1950s.50 U.S. intelligence did not learn of the Israeli weapons program until a few years later,51 and tended to underestimate the progress of the program through the 1960s.52

heightened costs from nonproliferation sanctions

Nuclear energy **programs** impose another political restraint on states by **increas**ing the potential **costs** of **nonproliferation** **sanctions**, which are likely to **disrupt** the **international** **trade** and fuel **supplies** **essential** to most nuclear **energy** **programs**. Sanctions are especially threatening to the majority of nuclear energy programs that rely on LWR technology. As Richard Lester and Robert Rosner note, “[N]uclear power is one of the most **highly** **globalized** of all industries. The nuclear power plant supply industry is dominated by a **small** **number** of **large** global **suppliers** of light water reactor equipment and technology.”53 Christopher Lawrence likewise argues that the LWR fuel cycle “is one of the most globalized technologies in existence.”54 Only twelve countries currently produce fuel rods for light water reactors,55 compared to thirty-one countries with operational nuclear energy programs.56 At the same time, most nuclear power reactors are designed and constructed by a few American, Chinese, French, Russian, and South Korean firms.57 Eleven out of twelve LWR fuel **producers** and all have major reactor-supplying countries are **members** of the Nuclear Suppliers Group (**NSG**), an organization founded in the 1970s that calls for **IAEA** **safeguards** on exports and a **commitment** to **peaceful** **uses** of imported materials.58 For countries operating light water power reactors, the choice is either to develop enrichment technology—and risk international suspicion and pressure, as described above—or to import enriched uranium fuel, thus rendering the energy program vulnerable to disruptions in supply.

As early as 1957, U.S. policymakers were aware that exports for nuclear energy programs provide leverage that can be used to enforce nonproliferation regulations. As one National Security Council report argued, “U.S. preeminence and influence in peaceful uses of atomic energy overseas and nuclear technology will enhance general acceptance of effective safeguards to minimize diversion of nuclear material to weapons purposes.”59 A 1974 government study on nonproliferation likewise contended, “[A] vigorous US program of commercial nuclear cooperation with other nations can help maintain influence over foreign programs through proper safeguards, dependence on external supply, and the confidence of a constructive association in peaceful programs.”60 The Soviet Union similarly used fuel supplies and safeguards to maintain control over its clients’ nuclear programs.61

As George Quester wrote in 1977, many **countries** will “be **ready** to **accommodate** to the **halting** of weapons **proliferation** in various ways, as long as it seems that this is **required** to speed or maintain the availability of such American imports” for their energy **programs**.62 According to Steven Miller and Scott Sagan, “The **leaders** and bureaucratic **organizations** that run successful nuclear power enterprises will **want** to **maintain** **strong** **ties** to the global nuclear power **industry**, to international capital and technology markets, and to global **regulatory** **agencies**—and hence will be more **likely** to **cooperate** with the nuclear nonproliferation regime.”63 U.S. and international nonproliferation policy has been guided by this logic for decades and has tightened over time. In 1978, the United States made nuclear exports conditional on a country’s acceptance of safeguards on all of its nuclear facilities, including those not provided by the United States.64 The NSG followed suit in 1992.65 Although the U.S. position in the nuclear marketplace has substantially eroded in recent decades,66 the United States continues to play a pivotal role in setting the rules in the NSG, which sets guidelines for other key suppliers.