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Climate change and national security

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ABSTRACT

Everyone knows there is a climate crisis at hand and that humankind is to blame. Drastic measures are needed now to arrest human-induced climate change from greenhouse gas emissions. Or maybe not. The first part of this article will show that prevailing narratives and public perceptions of climate change are distorted by a series of exaggerations. The second part of the article examines efforts to link climate change to US national security. And the final part of the article explains why current climate policies pose a greater threat to US national security than the climate does.

Climate change and US national security

Everyone knows there is a climate crisis at hand and that humankind is to blame. Time available to halt this looming catastrophe is quickly running out and drastic measures are needed now to arrest human-induced climate change from greenhouse gas emissions. Evidence of this is visible all around us. The August 2021 release of the Sixth Assessment Report (AR6) by the UN's Intergovernmental Panel on Climate Change (IPCC) added more compelling evidence – as if any were needed – amplifying and clarifying the scientific case supporting the dire threat posed by climate change. The mounting climate crisis even imperils America's national security as stated prominently in the Biden administration's March 2021 *Interim National Security Strategic Guidance* and October 2022 *National Security Strategy*. Or maybe not. In reality, more and more evidence is emerging that climate change does not pose a threat to US national security, but the US government's overreaction to climate change does.

Earth's climate has warmed

The Earth's climate is warming and humans are contributing to that warming; however, the relative impact of natural causes for that warming compared to manmade contributions is hotly debated.[1] Since the mid-1800s, a time when human greenhouse gas emissions were minimal, the Earth's climate has warmed approximately one degree

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Celsius (1.1 °C) or 2° Fahrenheit (F).[2] That small amount of warming followed the end of the so-called Little Ice Age (circa 1500–1850)[3] and it did not occur uniformly or in tandem with the increased atmospheric concentration of carbon dioxide and other human-produced greenhouse gases.[4] That might surprise some readers, but it is not a point of dispute among scientists. As carbon dioxide concentrations remained relatively low in the early 1900s, the temperature increased rapidly.[5] Indeed, more than half of the Earth's warming over the span of the 20th century occurred before 1940, amounting to a 0.5° C increase *before* significant amounts of CO2 or other greenhouse gases were added to the atmosphere.[6] Then, as carbon dioxide concentrations increased dramatically from about 1940–1975, the Earth's temperatures plateaued or even decreased slightly.[7] By the mid-1970s, the Central Intelligence Agency was warning of threats to US national security stemming from likely crop failures and consequent political turmoil and mass migration caused by climate change – only then it was not global warming but predicted cooling like that seen during the Little Ice Age.[8] That calamity was averted when the Earth's climate began warming again.[9] By the late 1980s, some scientists began sounding the alarm about global warming, and indeed the climate warmed at a relatively rapid rate, as it had in the early-1900s.[10] The new stretch of warming lasted until the unusually warm year of 1998 when a very strong El Niño—a natural warming of the Pacific Ocean known to mariners for centuries—helped boost global temperatures to a record high.[11] Then a funny thing happened. The warming stopped. For a decade and a half, there was no warming.[12] The campaign to stop Global Warming became a race to halt Climate Change.[13] Many headlines since 2014 have trumpeted a resumption of global warming, noting record breaking temperatures – the hottest July or the warmest summer on record. Too often, those headlines have been wrong, or at least seriously misleading. That is because the margin of error—the range of uncertainty and potential inaccuracy in the data—is often markedly larger than the purported increases established by the new "record" temperatures.[14] More accurate reporting would note the supposed new record was in fact a tie with the previous high(s). Put another way, more accurate reporting would note that there was no discernable warming. By 2022, some climate change skeptics accused the UN IPCC and NOAA of trying to hide the lack of detectable warming since 2016, when another powerful El Niño pushed temperatures to a statistical tie with those of 1998.[15] Climate scientists have no explanation for this climate behavior. Their best climate models did not predict that behavior. Today's models are no better.[16] Almost certainly, humankind's addition of billions of tons of carbon dioxide to the atmosphere has had some warming effect, but the magnitude of human impact is highly uncertain.[17] Far more certain is Washington's potential to harm US national security by overreacting to climate change.

The first part of this article will show that prevailing narratives and public perceptions of climate change are distorted by a series of exaggerations – exaggerations about human understanding of climate dynamics, exaggeration about what is happening to Earth's climate and how quickly it is happening, exaggerations about the manmade contribution to climate change, exaggerations about the steps being taken to limit climate change, and exaggerations about what can be done to limit climate change using the proposed methods. The second part of the article examines efforts to link climate change to US national security. And the final part of the article gives a generous measure of credence to warnings about climate change – more than the author

feels comfortable endorsing – and then explains why even if one is inclined to believe the climate today is changing in a manner harmful to US interests, the risks of over-reacting outweigh the risks of underreacting and in fact current climate policies pose a greater threat to US national security than the climate does.

Part I – a climate of exaggeration

Unsettled science

We should begin with humility about the limits of human understanding of Earth's climate and by acknowledging the diversity of views among respected scientists and other experts. Scientific understanding of Earth's climate is hampered by the dearth of reliable data—geographically, over time, and especially for the oceans; the incomplete understanding of the many interacting natural drivers of climate change; and, relatedly, the inability to accurately model the climate.[18] As the IPCC has admitted, "The climate system is a coupled non-linear chaotic system, and therefore the long-term prediction of future climate states is not possible."[19] The climate's complexity, the insufficiency of data, and the imperfect state of scientific understanding combine to help explain why there is not now, nor has there ever been, anything like the oft cited 97 percent of scientists who believe in catastrophic, manmade global warming or climate change.[20] Probably the most notorious "survey" purporting to demonstrate the 97-percent claim was found on closer examination to show at most 0.5 percent of papers in the survey advanced the notion that manmade global warming posed a threat of crisis proportions.[21] There are many respected scientists, including former lead-authors of the highly touted IPCC reports, who are skeptical of the theory of human-induced, catastrophic climate change and exasperated by the hype and deceptions surrounding climate change.[22]

Dr. Steven Koonin, an eminent theoretical physicist who served as Under Secretary of Energy for Science and Innovation in President Barak Obama's first term, probably did more than anyone to expose and explain this state of affairs in his 2021 book *Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters*. As Koonin noted, the situation is ripe for confirmation bias: "the science is unsettled enough that *any* unusual weather can be 'attributed' to human influence."[23] Unfortunately, those who challenge climate catastrophism are often attacked as climate deniers and suppressed, making it risky for young up-and-coming scientists to express even the slightest dissent with the dominant narrative about scientific consensus of a pending human-caused climate catastrophe.[24] This probably explains why it is mostly the well-established, retired, or about-to-retire experts—such as Richard Lindzen, Judith Curry, and Patrick Moore—who challenge the dogma of manmade, catastrophic climate change and highlight the significant limits to human understanding of Earth's climate and humankind's impact on it.[25]

Evidence of a non-crisis

One of the main reasons the science remains unsettled and that more and more scientists appear comfortable bucking the prevailing narrative is the failure of the observed climate to conform to so many dire projections. For more than three decades, a chorus

of environmentalists, geologists, and climate scientists have warned that mounting levels of greenhouse gases in Earth's atmosphere were leading to extreme weather events, including more numerous and more severe hurricanes, more numerous and extreme tornadoes, more frequent and intense heatwaves, more continuous and ferocious wildfires, more widespread droughts and floods, and more rapidly melting glaciers and rising sea levels. Fortunately, the reality of all these weather-related events is far from alarming, notwithstanding what one might hear on the nightly news or read in newspapers. As Dr. Koonin explains in *Unsettled*, "record high temperatures in the US—they're no more common today than they were in 1900," nearly a century's worth of observations shows "human influences haven't caused any observable changes in hurricanes," "the global area burned by fires each year has declined by 25 percent since observations began in 1998," and while "sea levels…have been rising over the past many millennia…the current rate of rise (about one foot per century)…explain[s] why it's very hard to believe that surging seas will drown the coast any time soon."[26] When discussing these claims, Koonin is careful to note: "Those statements are not my science. They're not my spin on the science. They're what's there in the [IPCC and US government] reports, although sometimes buried and you've got to read them carefully."[27] And, citing the work of Yale's Nobel Prize winning climate economist William Nordhaus, even if global temperatures were to go up 6 degrees Centigrade by the year 2100—four times the target limit sought under the Paris Climate Accord and an added fivefold increase above the 1 degree Centigrade increase since the mid-1800s—the impact on US and global GDP would be on the order of a few percent—hardly a catastrophe.[28]

While Koonin may be the latest, most prestigious, and impeccably credentialed scientist to point to the gaping discrepancies between terrifying claims and the unalarming physical record, he is far from being the only respected scientist or expert to call out these inaccuracies.[29] Other researchers and commentators such as Bjorn Lomborg, and Alex Epstein point to the stunning worldwide drop in deaths caused by severe weather—99 percent over the past century.[30] The more detached from reality the claims of climate crisis have become, the more that contrarian experts are speaking up, even though their well-founded skepticism risks their being branded as "deniers."[31] Predictions of climate catastrophe due to human greenhouse gas emissions have been made for nearly 35 years, and yet Earth's climate stubbornly refuses to lend evidence of a "climate crisis" or the "existential risk" claimed in the Biden administration's *Interim National Security Strategic Guidance* and 2022 *National Security Strategy*.[32] The scary projections are always based on models, not observed trends in the climate, and those models have proven unreliable.[33]

Contrary to the prevailing narrative of climate doom, Earth's warming is mild and largely beneficial—mostly moderating cold temperatures in northernmost latitudes and at night; there are no climate-caused dangerous trends in global weather such as hurricanes, droughts, floods, or wildfires; human deaths attributed to extreme weather events have declined over 99 percent over the past century; increasing levels of CO2 are a net positive—enabling photosynthesis using less water and greening the planet; coral reefs are not threatened by warming or increased CO2; polar bear populations are increasing; the Antarctic ice sheet is growing; the IPCC says the Greenland ice sheet under all scenarios would take centuries if not millennia to melt; the Arctic will

remain decidedly frozen in winter even if it becomes ice-free in summer—a phenomenon that would have almost no impact on sea levels as Arctic ice is already floating on the ocean; with some natural variation, sea levels continue to rise at the same slow rate as they have for 5,000 years—less than a foot per century; the oceans are and will remain markedly alkaline—burning all of the coal, oil, and natural gas on Earth would not change that—and studies show marine life adapts well to changes in pH; and, finally, there is no evidence of mass species die-offs or a coming great extinction. These claims are so starkly counter to what everyone "knows" that it would take a book or several books to explain and document their veracity. Fortunately, such books have been written by scientists and researchers who understand that Earth's climate is constantly changing and who acknowledge the planet has warmed just over 1 degree Centigrade over the past 170 years and that CO2 and other human produced greenhouse gases contributed something to that warming. These are serious, intelligent people who have studied the evidence and cannot be dismissed as "deniers." The enormous gap between the unscary reality of climate change and the dire statements and radical, multi-trillion-dollar policies of those pushing to "fix" the climate has led critics of the climate hype to brand it as dishonest, unscientific, and immoral.[34]

Exaggerated human impact

Richard Lindzen, the former Sloan Professor of Atmospheric Science at the Massachusetts Institute of Technology, highlighted the gap between the reality of climate change and climate alarmism:

> The claims that the earth has been warming, that there is a greenhouse effect, and that man's activities have contributed to warming, are trivially true and essentially meaningless in terms of alarm.
>
> Nonetheless, they are frequently trotted out as evidence for alarm.[35]

Steven Koonin made a similar point in August 2021, contradicting the Secretary General of the United Nations who claimed the just-released IPCC report indicated a "Code Red for Humanity."[36] Koonin countered that,

> The statement that we've broken the climate and face certain disaster unless we do something drastic is not supported at all by the science. ….
>
> I believe that the threat from climate change, to the extent that there is a threat, is pretty distant both in space and time—the US will be able to adapt just fine. And I have a hard time understanding what the rush is, particularly since the US is only 15% of total greenhouse gas emissions, anyway."[37]

Even if there were compelling evidence of a dangerously warming or changing climate, and there is not, it would be wrong to blame it all on humans, but that is just what the August 2021 *UN IPCC AR6 Summary for Policy Makers* did.[38] It would be especially wrong to blame it on human-produced CO2.[39] We live in a world starved of carbon dioxide;[40] human CO2 contributions to the atmosphere are small compared to the amount of carbon dioxide in Earth's natural carbon cycle; and manmade CO2 does not appear to play a leading role in influencing Earth's climate.[41] Carbon dioxide is a trace gas at 415 parts per million (ppm) or 0.04 percent of Earth's atmosphere.

A study by Skrable, Chabot, and French published in early 2022 compared various isotopes of carbon in the atmosphere and concluded that more than three-fourths of the CO2 generated from burning fossil fuels since 1750 is not in the atmosphere but has been absorbed into the carbon sinks of the planet's natural carbon cycle.[42] This finding led the study's authors to write "Our results show that the percentage of the total CO_2 due to the use of fossil fuels from 1750 to 2018 increased from 0% in 1750 to 12% in 2018, much too low to be the cause of global warming."[43] Atmospheric levels of carbon dioxide were much higher in Earth's distant past.[44] Indeed periods of significantly higher temperatures and higher CO2 levels—more than five times today's level—correspond to the flourishing of life on Earth.[45] As Patrick Moore, one of the founders of Green Peace, put it, "As carbon dioxide declined from 2,500 ppm during the past 150 million years, it was not until about five million years ago that it had declined to today's level of 415 ppm. It is rather preposterous to suggest that 415 ppm is somehow dangerous when all animal life, including our mammalian ancestors, lived through millions of years where carbon dioxide levels were at 2,000 ppm and higher."[46] According to Skrable and his colleagues, "Earth is still in the Holocene interglacial period that started 11,500 y[ears] ago. Its peak temperature change over the 11,500 years… appears to be significantly less than those over the three previous interglacial periods."[47] In other words, Earth will likely go on warming until the onset of the next period of glaciation driven by natural mechanisms, regardless of human uses of fossil fuels.[48]

To the extent there has been a correlation between atmospheric CO2 levels and global temperatures, a rise in carbon dioxide in the atmosphere *followed* Earth's rising temperatures by an average of 800 years, as warming oceans—the planet's principal carbon sinks, containing approximately 45 times as much CO2 as the atmosphere—gradually yielded the CO2 absorbed during colder times.[49] Scientific evidence from the past 2.6 million years strongly suggests natural warming of the planet (in synch with cyclical changes in solar radiation corresponding to Milankovitch Cycles) caused increased concentrations of CO2 in the atmosphere, not the other way around as former Senator Al Gore claimed in his movie *An Inconvenient Truth*.[50] Skrable and his coauthors note that "the increase in CO2 that Earth has been experiencing since 1800 appears to have started more than 5,000 years ago."[51] This is not evidence to support the notion that it is even more important than ever to control carbon emissions; it is evidence that while carbon-dioxide is a known greenhouse gas it is in all likelihood not a strong driver of Earth's climate.

Water vapor is a more powerful greenhouse gas than carbon dioxide, with water vapor accounting for up to 90 percent of the heat-trapping effect of greenhouse gases.[52] And, water vapor dominates the greenhouse effect in all but a narrow slice of the infrared spectrum where CO2 might add to the effect.[53] Moreover, CO2's ability to trap heat in the atmosphere falls off logarithmically such that each additional increment of added CO2 has a comparatively smaller impact.[54] In no small understatement, Steven Koonin put it this way: "The global temperature went down between 1940 and 1970 even as greenhouse gases increased. That's got to tell you immediately that things are a little more complicated than just the greenhouse gases are warming the earth."[55] Other highly credentialed and respected scientists go further in dismissing the idea that anthropogenic carbon emissions are driving global warming or that added CO2 or mildly increasing temperatures are bad for the climate or life on Earth. In the

spring of 2021, Princeton University Professor Emeritus of Physics William Happer pushed back on claims of a climate crisis, stating,

> All of the objective evidence is that the increases in CO2 are benefitting the Earth. The Earth is getting greener. Deserts are shrinking. None of the terrible things you hear are happening. Quite the opposite is happening. And that's completely expected because [for] most of geological history CO2 levels have been much higher than now. They've been three, four, five times higher than now, and plants are adapted to grow at much higher CO2 levels. And of course we depend on plant growth for our survival. And so, there's nothing bad about increasing carbon dioxide.[56]

Despite the known benefits and apparently modest, perhaps inconsequential, drawbacks of increased atmospheric CO2, there has been no shortage of extraordinarily expensive proposals to "fix" the supposed problem of anthropogenic greenhouse gas emissions.

Exaggerating what is being done – costs without benefits

Political leaders and policy advisors the world over have consistently exaggerated humankind's ability to "fix" the climate through schemes to limit greenhouse gas emissions, and their proposed "fixes" would come at enormous expense without meaningfully moving the needle on Earth's future temperatures. While it is often claimed that failing to act boldly now will inevitably lead to greater costs to fix the climate later, the exact opposite seems much more likely. Like the benefits of compounded interest in reverse, money squandered today on ineffective and unnecessary measures would have an outsized impact in robbing future generations of the resources to develop economically and to master the effects of Earth's changing climate.[57] According to the architects of the Paris Climate Accord, global financial commitments—to be paid by developed nations such as the United States—would cost somewhere between one and two trillion dollars each year between 2030 and the end of the century, but would only shave off 0.22 degrees Centigrade (or 0.4 degrees Fahrenheit) of the global temperature by the year 2100.[58] According to Bjorn Lomborg, implementing a "Sustainable Development or Green Road pathway" that cuts energy use and produces less in the way of greenhouse gas emissions instead of a "Fossil-fueled Development or Conventional Development" pathway "…means we're literally holding the world back by a generation. By the end of the century, the difference for the entire world population is a staggering $509 trillion *per year*."[59] Again, citing Lomborg: "Currently we have promised to spend $1-$2 trillion every year, and we won't be able to tell the difference in temperature even in a hundred years. …every dollar the Paris Agreement costs will avoid just 11¢ worth of long-term climate damage. That isn't sensible."[60] And while the United States cut its CO2 emissions by over 15 percent since 2005, global CO2 emissions during that same period increased by more than 30 percent due to increasing use of fossil fuels in the developing world—especially China and India.[61] Under the Paris Climate Agreements, cuts to greenhouse gases are voluntary and nonbinding. Still neither China nor India elected to set targets for cutting greenhouse gases. As Vaclav Smil noted in *How the World Really Works*, the Paris Agreement "…would, even if all voluntary non-binding pledges were honored (something utterly improbable), result in a 50-percent *increase* of emissions by 2050."[62]

Exaggerating what is being done stems in part from a failure to understand what can be done, and what cannot.

Exaggerating what can be done – our fossil fuels future

Notwithstanding government mandates and trillions of dollars spent globally to move away from fossil fuels and promote renewable energy, fossil fuels—coal, oil, and natural gas—will be the mainstays of global energy well into the future, and fossil fuels could make up two-thirds of all primary energy globally, even by 2080.[63] Globally, fossil fuels are used to generate approximately two-thirds of all electricity, with most of the remaining one-third of electricity coming from nuclear power and hydropower.[64] Despite some impressive advances over the past decade in fielding wind and solar energy capacity, the problem of intermittency – the loss of power production when the sun is not shining or the wind is not blowing – has led some to suggest these renewables should more accurately be thought of as "unreliables" or even as "parasitical."[65] The term "capacity factor" refers to the percentage of actual power a power plant generates and puts into the grid compared to the amount it could theoretically produce if it could operate reliably all the time at full capacity. The intermittency of solar and wind results in global average capacity factors of about 20 to 25 percent, respectively, meaning in many cases wind and solar are not replacing reliable forms of energy, they merely ensure reliable backup power must operate and must do so in an inefficient manner—starting and stopping on unpredictable schedules.[66] It is as if these highly subsidized, material-intensive, energy-intensive, and land-intensive means of producing electricity did not work 75–80 percent of the time. While certain aspects of intermittency are predictable, such as the sun's not shining at night and its shining for fewer hours during the shorter days of winter, other aspects like cloudy days or periods when the wind stops blowing are unpredictable. Thus, the more wind and solar capacity installed, the more one needs reliable or controllable power plants (usually natural gas-fired plants) on standby to jump in when the wind stops blowing or clouds blot out the sun. This makes the true costs of wind and solar higher than advertised and their benefits at reducing carbon dioxide lower than claimed.[67] Thus, not only will wind and solar fail to replace fossil fuels and nuclear power by mid-century, it could be argued that they are not even good supplemental sources of power for many regions of the globe. In some circumstances (Germany) today's wind and solar technology should be viewed as expensive, superfluous, even parasitic add-ons that consume resources, raise energy costs, and lower grid reliability. For reasons of physics and economics that is likely to remain the case for decades if not longer.[68]

The need for backup power could be reduced with breakthroughs in energy storage, but the challenges associated with realistic, affordable, and sustainable energy storage are beyond formidable and their prospects today appear extremely remote in spite of decades of government funded and private sector research.[69] Moreover, wind and solar power generation require enormous amounts of land compared to fossil fuels and nuclear energy.[70] Ideal siting for wind and solar farms is usually far from centers of demand for electricity, meaning the significant costs of building power transmission lines from where wind and solar are generated to where power is needed must also be factored into the true costs of these unreliable "green" renewables. Low power density, remoteness

from population centers, and intermittency conspire to constrain the pace and extent of the transition away from fossil fuels for producing electricity. And electricity production accounts for just 27 percent of global greenhouse gas emissions.

Transportation, responsible for 16 percent of global greenhouse gas emissions, is almost entirely reliant on fossil fuels, especially oil. In the United States, 90 percent of transportation is powered by petroleum products.[71] And except for passenger cars, some urban mass transit, and high-speed trains, it is not presently practical or even feasible to switch to electric vehicles or otherwise transition away from petroleum.[72] Electrifying air transportation, commercial shipping, long-distance trucking, and all freight rail is not going to happen in the next several decades and may never make sense. Of course, charging electric vehicles using electricity generated by burning fossil fuels would waste energy and would add as much or more CO2 to the atmosphere than simply powering the same vehicles with gasoline, diesel fuel, or compressed natural gas.[73] Biofuels currently comprise 5-6 percent of liquid fuels in America—the world's leading producer of biofuels.[74] Ethanol, mostly produced in America from corn feedstock and blended with gasoline, is by far the leading biofuel, yet it delivers just two-thirds of the power of an equivalent volume of gasoline.[75] A 2015 report by Robert Bryce for the Manhattan Institute found that ethanol cost taxpayers "more than $10 billion per year in extra fuel costs above what they would have paid if they had purchased gasoline alone. … For eight full years—1986, 1987, 1988, 1989, 1992, 1994, 1997, and 1998—ethanol cost at least three times more than an energy-equivalent amount of gasoline."[76] And in 2012 "The American Automobile Association warn[ed] motorists not to use E15 [gasoline blended with up to 15 percent ethanol] because the fuel may damage their vehicles."[77] Despite the goal to make renewable fuel less carbon-intensive than gasoline (codified in the expanded 2007 US Renewable Fuel Standard), a study published in early 2022 in the *Proceedings of the National Academy of Sciences* found that producing a gallon of ethanol produces 25 percent *more* CO2 relative to gasoline.[78] The same study found the US push for ethanol increased corn prices just over 30 percent and soybean and wheat prices by about 20 percent each, while displacing just 5 percent of gasoline use.[79] Thus, it would be unwise to significantly expand ethanol fuel production before a commercially viable way is found to produce ethanol from agricultural waste products or fast-growing cellulosic material such as switchgrass—neither of which is in the offing despite decades of research and government funding. Now is not the time for talk of banning internal combustion engines or rapidly shifting away from fossil fuels for transportation.

Whereas electricity production and transportation account for 43 percent of global greenhouse gas emissions, a full 50 percent of greenhouse gases come from what Vaclav Smil calls "the four material pillars of modern civilization…steel, ammonia, cement, and plastic."[80] Smil devotes two chapters in *How the World Really Works*—Chapter 2: Understanding Food Production, and Chapter 3: Our Material World—explaining the enormity of scale and centrality of fossil fuels in the production of ammonia (for nitrogenous fertilizers), steel, cement, and plastics. It should come as no surprise then that in March 2022, Manhattan Institute senior fellow Mark Mills observed,

> [A] rapid transition away from traditional energy just isn't visible in the data.

> Oil, natural gas, and coal supply 84 percent of global energy. That share has shrunk by a mere 2 percentage points over the past two decades. And that's after more than $5 trillion being spent by governments in pursuit of avoiding fossil fuels, along with endless admonitions and mandates in the age of "climate awareness."
>
> Burning wood still supplies civilization far more energy than all of the world's solar panels. Oil still fuels nearly 97 percent of all of the world's transportation. Crop-derived liquids supply most of the rest, with electric vehicles (EV) striving to reach a 1 percent share of that energy sector.[81]

This reality is not going to change significantly in the decades ahead even if the United States spends trillions of dollars to fund the 2015 Paris Climate Accord and even if America achieves the ambitious—some might say unrealistic—goals of President Biden's December 2021 "Executive Order Catalyzing America's Clean Energy Economy Through Federal Sustainability."[82] The United States after all emits just 15 percent of global greenhouse gases each year and its percentage has been going down over the past decade as China's and India's continue to climb.[83]

Exaggerating the importance of mitigation – adaptation is the answer

Since 1992, all nations have committed themselves (to varying degrees) to reducing greenhouse gases so as to avoid the worst consequences of climate change, but their efforts would be better spent spurring economic development and climate adaptation or as Alex Epstein calls it, climate mastery. In December 2021, Glasgow Scotland hosted the 26th Conference of Parties (COP26) convened as part of the United Nations Framework Convention on Climate Change (UNFCCC).[84] Such international confabs frequently disappoint, as happened with Kyoto (COP3) and Copenhagen (COP15). But even when they "succeed," as in Paris (COP21), the results have been less than impressive. That is because the largest greenhouse gas emitters fail to make meaningful commitments, and when large emitters do make commitments, they typically fail to meet them. Given the high costs and dubious benefits of the Paris Climate Agreement, such failures have been blessings in disguise, especially when it comes to curbing emissions of carbon dioxide.

Koonin suggests that another doubling of atmospheric CO2 compared to preindustrial levels (going from today's 410 to 800 ppm) should have very little effect compared to that already caused by going from 280 ppm in the preindustrial age to 410 ppm today.[85] That is because the greenhouse gases already in the atmosphere are now trapping almost 100 percent of the infrared radiation that would otherwise radiate out into space. Adding additional greenhouse gases, especially the increasingly weak effect of CO2, has been likened to painting a window black; the first coat does almost all of the work in blocking light from going through the window and additional coats of paint do little if anything to contribute to making the window opaque. As Koonin explained "…doubling it [today's level of atmospheric CO2] doesn't change things much (an additional 0.8 percent [heat trapping effect]) due to the 'painting a black window' effect we've already discussed."[86] Lindzen of MIT made a similar point 15 years earlier when CO2 levels were just 380 ppm, noting "the fact that we already have three quarters of the climate forcing expected from a doubling of CO2 means that *if one*

truly believes the models, then we have long since passed the point where mitigation is a viable strategy. What remains is to maximize our ability to adapt."[87] In his book *Fossil Future*, Alex Epstein persuasively argues that Earth's climate has ever been hostile and deadly to humans, and that our species' ability to survive, develop economically, and flourish has always depended not only on our ability to adapt but to *master* the climate—and that requires plentiful, affordable, reliable energy. Epstein's argument is the moral complement to Bjorn Lomborg's economic case for enabling development now so that a wealthier future world will have the resources to adapt to the climate in 2100, whatever that climate turns out to be. For economic and scientific reasons, the world cannot now transition away from fossil fuels.

Part II – climate change: a threat to national security?

Attempting to end the use of fossil fuels or achieve net zero carbon emissions by 2050 would not only be futile as described above, but it would also be damaging to US national security. Climate change itself does not presently threaten US security and could even prove to be a net positive for America and much of the rest of the world. The United States is well poised to adapt to the anticipated effects of Earth's changing climate. But even if one believes the harm from a changing climate more than outweighs any good that might come from it, US attempts to rapidly accelerate the transition away from fossil fuels to whatever comes next will waste money America does not have and will put America at a distinct disadvantage in its strategic competition with the likes of China, Russia, and Iran, robbing the United States of relative power and absolute power, and threatening US national security. America's anti-fossil fuel policies are already weakening the United States in geoeconomic and geopolitical terms. Washington's climate policies are also undermining the foundations of domestic US power, especially by hurting the US economy, the wellspring of American power. And while the many US government climate adaptation plans – produced by nearly every executive branch department and agency in response to President Biden's early-2021 executive orders on climate change – contain much that is sensible and necessary for US national resilience, the Department of Defense (particularly the US Army) is pursuing misguided energy solutions that will weaken America's combat capabilities. Russia's 2022 invasion of Ukraine helped illustrate the veracity of these claims, as will be discussed in Part III of this article. An even worse future awaits America if Washington does not abandon its current climate-change mania and learn to embrace adaptation to (or mastery of) Earth's changing climate in pursuit of US energy, economic, and security imperatives.

Intersection between climate and US national security

The link between Earth's changing climate and harm to US national security is indirect, distant, and eminently manageable, but it is not a new notion. The idea that climate change held implications for US national security predates fears of global warming. In the 1970s, the Central Intelligence Agency warned that global cooling would cause food shortages that could lead to political instability and mass migration thereby harming US interests.[88] The idea that global warming (later rebranded climate change) might threaten American interests began to take hold in the 2000s. Nils Gilman, Vice

President of Programs at the Berggruen Institute in Los Angeles, claims that his former employer, Global Business Network (GBN), "was among the first to treat climate change as a serious security issue in a systematic way. In a 2003 report for the Defense Department's Office of Net Assessment, GBN argued in part that climate change posed a variety of security threats that the Pentagon needed to take seriously."[89] Gilman, while professing to believe in the urgency and security dimension of climate change, confessed to a "disingenuous alliance between concepts"—of climate change and national security—driven in part by a desire to enlist the support of deep-pocketed allies in what he called the "military-intelligence-industrial complex."[90]

In 2007, the Center for Naval Analysis (CNA) – a federally funded research and development center – published *National Security and the Threat of Climate Change*, a study report on global warming oddly reminiscent of the CIA's alert about the consequences of global cooling: "Climate change can act as a threat multiplier for instability in some of the most volatile regions of the world, and it presents significant national security challenges for the United States."[91] Published just two years after Hurricanes Katrina and Rita hammered the US Gulf Coast, the CNA report seemed timely in its day, warning that "The nature and pace of climate changes being observed today and the consequences projected by the consensus scientific opinion are grave and pose equally grave implications for our national security."[92] That alarm now seems overblown given that 2005 was a record-setting hurricane season, following which no major hurricanes made landfall in the continental United States for 12 years.[93] The US government's 2017 National Climate Assessment would later note there was no discernable trend in tropical cyclone (i.e., hurricane) frequency or strength over the preceding century.[94] Ironically, the CNA report was published in the midst of a 15-year hiatus in global warming, so the "nature and pace of climate change being observed" was essentially nonexistent. Nonetheless, the same year CNA's report was published, the US Army War College's Strategic Studies Institute joined the Triangle Institute for Strategic Studies to host a 2-day symposium in Chapel Hill, North Carolina to examine the link between climate change and national security.[95] The proceedings of the symposium were published in 2008 and leaned decidedly in favor of treating climate change as a serious and growing national security challenge. Another academic look at the connection between climate change and national security appeared in the *Review of European Community & International Environmental Law*" and highlighted the "securitization" of climate change as evidenced by the first UN Security Council meeting to consider climate change as a threat to international peace and security. The paper noted "the securitization move in respect of climate change on an international level can be understood to have taken place c.2006–2008."[96]

Climate and the US intelligence community

In 2008, the US Intelligence Community (IC) formally took note of the possible security implications of climate change, and in the following 8 years, President Barak Obama's administration codified in national security strategy documents the changing climate's threat to US national security. Going back to the final 3 years of George W. Bush's administration – 2006, 2007, and 2008 – the "Annual Threat Assessment of the Director of National Intelligence" or "Annual Threat Assessment of the Intelligence

Community" (as the documents were variously called) made no mention of climate, warming, greenhouse gases, extreme weather, flood, drought, or sea level, although the reports did contain a fair bit of discussion about energy security and the global competition for resources.[97] But by 2008, the IC had its eye on climate change and its leaders testified to Congress about a "National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030."[98] Admiral Dennis Blair served as President Obama's first Director of National Intelligence (DNI), and 6 weeks after Obama's inauguration, Blair delivered the "Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee." In contrast to the IC's insouciance toward climate change during the Bush administration, Blair's annual threat assessment mentioned climate 23 times and included a new section titled "Environmental Security."[99] Appearing near the end of the 45-page IC assessment, the section on the environment, including climate, began by acknowledging that "Climate change, energy, global health, and environmental security are often intertwined, and *while not traditionally viewed as 'threats' to US national security* [emphasis added], they will affect Americans in major ways."[100] This 2009 assessment predicted the "already stressed resource sector will be further complicated and, in most cases, exacerbated by climate change, whose physical effects will worsen throughout this period."[101] With a nuance and balance absent in today's warnings about threats from climate change, Admiral Blair's testimony noted: "On the other hand, forcibly cutting back on fossil fuel use before substitutes are widely available could threaten continued economic development."[102] In a subsection "Assessing the Impact of Climate Change," the IC's 2009 judgments are worth citing at length because they highlight the indirectness of the threats climate change might pose to US national interests and even give a nod to potential positive effects of climate change.

> The Intelligence Community recently completed a National Intelligence Assessment on the national security impacts of global climate change to 2030. The IC judges global climate change will have important and extensive implications for US national security interests over the next 20 years. *Although the United States itself could be less affected and is better equipped than most nations to deal with climate change and may even see a benefit in the near term* [emphasis added] owing to increases in agriculture productivity, infrastructure repair and replacement will be costly. We judge the most significant impact for the United States will be *indirect* [emphasis added] and result from climate-driven effects on many other countries and their potential to seriously affect US national security interests. We assess *climate change alone is unlikely to trigger state failure in any state out to 2030, but the impacts will worsen existing problems such as poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions* [emphasis added]. Climate change could threaten domestic stability in some states, potentially contributing to intra- or, less likely, interstate conflict, particularly over access to increasingly scarce water resources. We judge economic migrants will perceive additional reasons to migrate because of harsh climates, both within nations and from disadvantaged to richer countries.[103]

By February 2015, halfway through President Obama's second term, the IC's annual assessment, issued by DNI James Clapper, only mentioned climate change four times and the threat from climate change was described in rather muted terms. The strongest passage averred that,

> Extreme weather, climate change, and public policies that affect food and water supplies will probably create or exacerbate humanitarian crises and instability risks. Globally

> averaged surface temperature rose approximately 0.8 degrees Celsius (about 1.4 degrees Fahrenheit) from 1951 to 2014… This rise in temperature has probably caused an increase in the intensity and frequency of both heavy precipitation and prolonged heat waves and has changed the spread of certain diseases. This trend will probably continue. Demographic and development trends that concentrate people in cities—often along coasts—will compound and amplify the impact of extreme weather and climate change on populations.[104]

By comparison, DNI Daniel Coates's 2019 World Wide Threat Assessment, halfway through Donald Trump's presidency, sounded a stronger alarm by noting that,

> ***Global environmental and ecological degradation, as well as climate change, are likely to fuel competition for resources, economic distress, and social discontent through 2019 and beyond***. Climate hazards such as extreme weather, higher temperatures, droughts, floods, wildfires, storms, sea level rise, soil degradation, and acidifying oceans are intensifying, threatening infrastructure, health, and water and food security. Irreversible damage to ecosystems and habitats will undermine the economic benefits they provide, worsened by air, soil, water, and marine pollution.
>
> Extreme weather events, many worsened by accelerating sea level rise, will particularly affect urban coastal areas in South Asia, Southeast Asia, and the Western Hemisphere. Damage to communication, energy, and transportation infrastructure could affect low-lying military bases, inflict economic costs, and cause human displacement and loss of life.
>
> Changes in the frequency and variability of heat waves, droughts, and floods—combined with poor governance practices—are increasing water and food insecurity around the world, increasing the risk of social unrest, migration, and interstate tension in countries such as Egypt, Ethiopia, Iraq, and Jordan.[105]

Similar projections of mounting threats carried over into the Biden administration. In October 2021, the US National Intelligence Council (NIC) published a National Intelligence Estimate (NIE) on climate change "in response to Presidential tasking", updating and upgrading the 2008 National Intelligence Assessment and extending the period under examination from 2030 out to 2040.[106] The NIE considered risks to US national security in three broad categories—Geopolitical Tensions Over Climate Responses, Climate Exacerbated Geopolitical Flashpoints, and Climate Effects Impacting Country-Level Instability.[107] These three broad categories were further divided into between four and six sub-categories, with 15 sub-categories total. According to the NIE, as of 2021 only three of the 15 subcategories reached the level of Medium Risk to US national security interests, while seven were judged Low Risk, and five sub-categories, fully one-third, were assessed at presenting no risk. By 2040, the NIC projects the United States will face High Risk to its national security interests in eight of the 15 sub-categories, and moderate risk in the other seven. While such a high-level summary suggests a serious rise in risks to US security, a closer look at the sub-categories calls into question the NIC's judgment on factors causing risks to US national security interests. For instance, the first four of the six sub-categories under Geopolitical Tensions Over Climate Responses are 1) Perceptions of Insufficient Contributions to Reduce Emissions, 2) Carbon Dioxide Removal not at Scale for Countries' Net-Zero Pledges, 3) Developing Country Demands for Financing and Technology Assistance, and 4) Petro States Resisting Clean Energy Transition Away from Fossil Fuels.[108] In other words, the pressure to decarbonize, not

climate effects per se, will drive the supposed increase in risks to US national security. In an era of Great Power Competition, nuclear proliferation, the COVID-19 Pandemic, the People's Republic of China's (PRC's) threats to forcibly take over Taiwan, skyrocketing fentanyl deaths in America, the PRC's "strategic breakout" (dramatically growing and diversifying its offensive nuclear weapons), and Russia's invasion of Ukraine, the NIE's identification of risks from climate change would seem of decidedly lesser magnitude if not completely dubious. The NIE's other nine sub-categories of risks and seriousness of the risks in those areas are equally suspect. Take away the global push to decarbonize, and the NIE is mostly a reminder that an inhospitable climate will exacerbate the perennial drivers of instability.[109]

The most recent annual threat assessment from the Office of the Director of National Intelligence, released February 7, 2022, sounded similar warnings to those of the 2019 annual threat assessment, including warnings of increased geopolitical competition in the Arctic. But, echoing the 2021 NIE, the 2022 threat assessment also added new concerns of friction among states stemming from international commitments to reduce greenhouse gas emissions and who will pay for the costly transition to a lower carbon future: "Geopolitical tensions are likely to grow as countries increasingly argue about how to accelerate the reductions in net greenhouse gas emissions necessary to meet the Paris Agreement goal of limiting global temperature rise to 1.5 °C since pre-industrial times."[110] And, "Countries will debate who bears more responsibility to reduce emissions and who should pay—and countries will compete to control resources and dominate new technologies needed for the clean energy transition."[111] In summary, over the past 15 years, the US Intelligence Community has moved from no mention of climate change to stronger but still measured judgments about the threat Earth's changing climate poses to US national security. Climate change, according to the IC, is rarely the sole cause of the threat, but instead is usually a confounding factor, exacerbating more powerful and long-standing drivers of instability such as overpopulation, poor governance, poverty, and competition over limited resources. Indeed, the latest assessments from the IC suggest that the greater part of the threat from climate change in the coming decades stems not from the climate itself but from tensions created by our collective reaction to climate change—the push for rapid decarbonization. Over that same 15-year period of the IC's reporting on the implications of climate change, the national security strategy documents promulgated by the White House have been less qualified, caveated, or conditional, and less consistent—reflecting greater concern and urgency under Democratic administrations and an absence of distress under Republican presidents.

Climate and national security strategy

In the two decades from 2002 to 2022, climate change evolved within US national security strategy documents from a matter of minimal concern for either party to become an acute crisis for US security in the eyes of Democratic Party administrations and a distraction or tool of America's adversaries in the view of Republican administrations. The final two national security strategies prepared during President Bill Clinton's second term mention climate change exactly once each, and even then as just one of several environmental maladies threatening human "health and economic well-being."[112] Two

national security strategies were produced during the George W. Bush administration—one in 2002 and the other in 2006. The 2002 strategy claimed the Bush administration would reduce greenhouse gases to limit climate change and boasted of spending the most of any country in the world for that purpose—$4.5 billion.[113] Three-and-a-half years later, the March 2006 national security strategy made no mention of greenhouse gases, warming, or climate change.[114] Following the growing chorus of warnings during the 2000s from academics, think tanks, the US intelligence community, and the UN's IPCC, President Barak Obama's 2010 national security strategy—the administration's first—made 23 mentions of climate change and issued an unequivocal declaration of the dangers it posed: "The danger from climate change is real, urgent, and severe. The change wrought by a warming planet will lead to new conflicts over refugees and resources; new suffering from drought and famine; catastrophic natural disasters; and the degradation of land across the globe."[115] Midway through Obama's second term, his administration released a second national security strategy linking climate change directly to US national security: "Climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources like food and water. The present day effects of climate change are being felt from the Arctic to the Midwest. Increased sea levels and storm surges threaten coastal regions, infrastructure, and property."[116]

In stark contrast to the Obama administration's threat perception, the administration of Donald Trump warned that climate change could be used by those scheming to limit US economic growth and energy security: "Climate policies will continue to shape the global energy system. U.S. leadership is indispensable to countering an anti-growth energy agenda that is detrimental to U.S. economic and energy security interests."[117] Climate change was not considered a threat, but climate and energy policies were.

In October 2022, President Biden's White House published its first formal national security strategy. The document was written and coordinated across the executive branch by early 2022 but delayed by the crisis leading up to and during Russia's ongoing war against Ukraine. Given the rhetoric of leading administration officials, including President Biden, it was no surprise the strategy mirrored the stand on climate change taken in the administration's March 2021 *Interim National Security Strategic Guidance* (*INSSG*). The *INSSG* mentioned climate 25 times, including 10 mentions of climate change and five mentions of "climate crisis," and one mention of "climate emergency."[118] In the *INSSG*, the Biden administration stated the situation with the climate could even threaten the existence of the United States: "Central to this agenda is building an equitable, clean, and resilient energy future, which is urgently required to head off *the existential risk posed by the climate crisis* [emphasis added]."[119] Similarly, the 2022 *National Security Strategy* used the term climate crisis ten times, twice used the word catastrophic in relation to climate change, and identified climate change as the direst "shared threat" to security, asserting that "Of all of the shared problems we face, *climate change is the greatest* and potentially *existential* for all nations [emphasis added]."[120] The threat of climate change is covered in every major section of the strategy, including the discussions of each of the various regions of the world. Four times, the strategy called the threat of climate change existential, declaring without caveat that "The climate crisis is the existential challenge of our time."[121] Time will eventually reveal the true nature and severity of the climate "threat," but evidence thus far strongly suggests the greater threat

to US national security lies in the widely championed rush to decarbonize in favor of so-called "clean" renewables—solar and wind.

Part III – the threat of overreacting

Energy security is national security

America's current climate policies – and in particular the rush to decarbonize – undermine US energy security and by extension US national security. And the threats those climate policies pose are far more certain and proximate in time and space than the supposed threats from climate change. The International Energy Agency (IEA) defines energy security as "the uninterrupted availability of energy sources at an affordable price."[122] And the aphorism that energy security is national security is easily demonstrated by examining the importance of energy security for the military, for foreign policy, and for the US and global economies.

Attempts to accelerate the shift away from fossil fuels will only come at enormous financial cost, will undermine American power, and will throttle the US economy—the wellspring of American power and the best guarantee of America's ability to adapt to any future climate. Staggering sums of money have been wasted already in premature efforts to prime the pumps of an energy transition and to kick start a "green economy."[123] The world would be better off accepting a more gradual transition to whatever comes next and letting whatever comes next emerge on the basis of its own merits, rather than having political leaders today trying to pick winners. The attempt to rush the transition will harm American national security by weakening America's military, reducing US influence in foreign affairs, and by damaging the American economy.

Oil and military power

Oil has been the *sine qua non* of modern, high-tech military capability at least since the Second World War (WWII) and will almost certainly remain so late into the 21st century. As the renown British historian of WWII Richard Overy noted in *Why the Allies Won*, "The war of engines, of aircraft, tanks, and trucks, was a war run on oil." Overy went on to explain that,

> So vital was oil to modern industry and modern war that the Axis states were willing to fight to gain control of it. The Japanese decision to attack the United States and Britain in 1941 was forced by an oil embargo that cut off from Japan 90 per cent of her supply. The prime target of Japanese soldiers and sailors in the drive southwards was the valuable oilfields of Borneo, Java, Sumatra and Burma…In 1942 Hitler's drive into southern Russia, against the generals' advice, was aimed at the even richer oilfields of the Caucasus.[124]

Planners in the US Army Air Forces identified petroleum targets as one of the linchpins to German military power. As Major General Haywood Hansell, a leading architect of US plans for bombing Axis Europe, wrote after the war, "The idea was to immobilize and restrict land, sea, and air weapons which were powered by liquid fuel."[125] When Allied bombing operations finally focused on German oil in 1944, the results were ruinous to Germany's military. As Robert Ehlers in his book *Targeting*

the Third Reich concluded, "Fuel shortages brought on by the oil offensive had a catastrophic effect on Wehrmacht operations."[126] Earlier in the war, Germany had tried to cut US fuel supplies to Great Britain and the Soviet Union, and German U-boats made US oil tankers a priority target.[127] Shortly after America entered the war, Admiral Karl Donitz, commander of Germany's submarines asked rhetorically "Can anyone tell me what good tanks and trucks and airplanes are if the enemy doesn't have the fuel for them?"[128] In the first months of 1942, Donitz initiated Operation Paukenschlag (Drumbeat) along the East Coast of the United States in which "Oil-carrying ships of any size were at the top of the target list."[129] Oil played an equally important role in the Pacific theater and the full story of Oil's centrality in WWII is masterfully told and well documented in Robert Goralski and Russell Freeburg's *Oil & War: How the Deadly Struggle for Fuel in World War II Meant Victory or Defeat*.

More than 75 years after America's fossil-fueled victory in WWII, petroleum remains absolutely essential to modern combat power. The US Department of Defense is today the world's single largest institutional consumer of fuels derived from oil.[130] And there is no substitute for petroleum-based fuels in the offing. Oil's unrivaled power-density, ease of storage, portability and use, low cost, reliability, scalability, and global availability have made it much more than the fuel of choice; it is the only viable fuel for airplanes, tanks, ground combat vehicles, and warships (not counting those large enough to be powered by their own nuclear reactors).[131] Director of the Energy Initiative at the Massachusetts Institute of Technology, Dr. Ernie Moniz (who subsequently became President Obama's Secretary of Energy) stated that gasoline has more than four times the energy-density of liquid hydrogen used as rocket fuel; Moniz noted in an understatement that gasoline would not be easy to replace.[132] Dr. Richard Muller, a physicist with Berkley National Laboratory, put it more forcefully:

> It's a miracle. Think about it. You can go 350 miles on a tank of gasoline. Three-hundred and fifty miles, the whole family, in a two-ton automobile, based on a tank that is this big [holds hands in front of himself to show dimensions]. And then, there's not even any residue. There's no ash. It's all gone and you fill it up again. You just fill it up again in 3 or 4 minutes. It's truly a miracle. It's very hard to replace.[133]

Thus, it is not surprising the United States insisted the US military be exempt from constraints on operations under the 1997 Kyoto climate accord.[134] While some observers claim the US military lost that exemption in the 2015 Paris climate agreement, the truth is the Paris accord neither specifically included nor excluded military operations, leaving it up to signatory countries to decide how to meet their non-binding emissions targets.[135] US combat effectiveness is rooted in training, and realistic military training demands a lot of fuel, especially for air forces and navies. Ground combat and realistic training for it also consume large quantities of fuel. And despite the logistical challenges of providing petroleum-based fuels to frontline units, it would be impossible to conduct sustained combat operations without such fuels. The US Army's planned transition to all-electric combat vehicles by 2050 is a prime example of the overreaction to climate change threatening to undermine US security.[136] While hybrid combat vehicles (the first step in the Army's transition) would seem to make sense—allowing prolonged operations between refuelings and reducing a unit's logistical burdens – plug-in electric vehicles do not. As hard as it was to get petroleum-based-fuels to landlocked Afghanistan, it would have been impossible, not just really hard but truly

impossible, to operate a fleet of electric combat vehicles there. The same applies to just about any poor or developing country lacking a robust electric grid. And it would be grossly inefficient and ineffective to deploy generators to slowly recharge all-electric combat vehicles – the logistical strain of supplying fuel for the generators and the long time needed to recharge the vehicles militate against that option. While portable solar panels might be adequate for recharging radio batteries, they would be orders of magnitude underpowered for the recharging needs of units operating a fleet of all-electric armored personnel carriers or other combat vehicles. The inherent advantages of petroleum-based fuels—cost, energy-density, abundance, worldwide availability, and ease of transport and storage, what Alex Epstein calls "fossil fuels' secret sauce"[137]—mean that a forced transition away from such fuels can only be purchased at the price of significant loss in American power projection and combat capability.

The Department of Defense's September 2021 Climate Adaptation Plan includes much that is sensible for enhancing the resilience of the department's infrastructure and supply chains.[138] But Defense leaders would do well to guard against the tendency of units to use climate change as a backdoor for funding items unrelated or superficially connected to climate adaptation and resilience. During the Global War on Terrorism (GWOT), Congress's supplemental GWOT funding was sometimes used for questionable purchases by the military services or units in the field.[139] According to Nils Gilman of the Berggruen Institute, it may already be past time to worry about such misdirection of resources: "the defense establishment's focus on climate-related security has instead served as little more than justification for enriching the military-industrial complex."[140] Nonetheless, extreme weather events, such as Hurricane Michael's hitting Tyndall Air Force Base on Florida's Gulf Coast in October 2018, flooding at Nebraska's Offutt Air Force Base in March 2019, and repeated flooding of Virginia's Norfolk Naval Base, have demonstrated the need for the Department of Defense to make its bases and infrastructure more resilient.

In the opening to *Fossil Future*, Alex Epstein neatly summarizes not only the energy-security nexus but the essential role that fossil fuels play in America's national security.

> The unprecedented security that America and, largely by extension, the rest of the free world enjoys today is due to America's economic strength and its military might. Both depend on low-cost, reliable energy. As Daniel Yergin documented in *The Prize*, war requires mobility, and wars are often won by those with the best mobile energy—above all oil. A world in which free countries are killing their economies, and by extension their militaries, while China leverages low-cost, reliable fossil fuel energy to become the largest economy with the most formidable military is not a world I want to live in.[141]

The crusade to end the use of fossil fuels will not only hobble the American military, it will rob Washington of influence abroad.

Energy and international influence and power

Russia's war against Ukraine well-illustrates the ways in which Western – and especially US – climate policies weaken US influence in the world while empowering other countries, including some US adversaries. Heading into the winter of 2021-2022, as Putin prepared his invasion of Ukraine, Russian energy companies maneuvered to enhance Moscow's power to coerce European capitals by threatening to cut off oil and

natural gas needed for heating homes and keeping Europe's economies running—especially Germany's, the EU's largest economy and the one most reliant on Russian energy. As *The Wall Street Journal* reported in May 2022, "Gazprom had left its German gas storage facility largely empty ahead of last winter. …[and Berlin] suspected the empty tanks were designed to give Mr. Putin extra diplomatic leverage as he prepared to attack Ukraine."[142] The *Journal* article pointed out that "Germany is especially reliant on gas because of earlier decisions to phase out nuclear and coal-fired power plants."[143] When Russia invaded Ukraine in February 2022, "Berlin was paying some 200 million euros, or about $208 million, a day to Russia for energy, blunting the impact of the Western financial sanctions that followed the invasion."[144] Since the invasion, Berlin has struggled to find new sources of energy and may temporarily have to increase its reliance on coal for electricity.[145]

Attempts to rapidly shift to new sources of energy have already cost Germany tens of billions of euros and are expected to damage the country's economy in the years ahead. As the *Journal* reported: "Cheap energy, especially natural gas, has been essential to the [German] economy's competitiveness, business organizations said, warning that many manufacturers could shut down without it. Some economists estimate Germany's gross domestic product could fall by up to 6% if Russian deliveries are stopped."[146] Robert Habeck, Germany's vice chancellor and economic minister and a leading member of Germany's Green Party, was quoted (in no small irony) as saying "'I'm not going to celebrate until gas and oil is reliably flowing, and we're not there yet.'"[147] But for the demonization of fossil fuels and Europe's related allergy to hydraulic fracturing that made America energy independent over the past decade, Europe would be far less dependent on Russian energy—which explains Russia's campaign to stop the spread of fracking.[148] The increased demand for non-Russian fossil fuels has already had a knock-on effect, raising oil and gas prices globally. While America has done what it can to divert existing US supplies of liquid natural gas (LNG) to Europe, the Biden administration's climate policies have stymied America's ability to assist as fully as it might.[149] And rather than taking steps to boost US and Canadian production of oil and gas and move it by pipelines to export terminals, the administration has maintained a business climate hostile to American fossil fuel production, thus weakening Washington's influence while boosting the power of oil and gas exporters Russia, Iran, Venezuela, and Saudi Arabia.[150] Indeed, until June 2022, Riyadh had refused to even consider the Biden administration's pleas to increase oil production even as Saudi Arabia pumped less oil than its quota under the Organization of Petroleum Exporting Countries (OPEC).[151] State-owned Saudi oil giant Aramco reported record quarterly profits in the first quarter of 2022 as it surpassed Apple Inc. to become the world's most valuable company—valued at $2.4 trillion.[152] Critics of current US climate and energy policies highlight the incongruity of Washington's willfully holding back US energy production and transport, such as canceling of the Keystone XL pipeline and rejoining the Paris Climate Accord on day-one of the Biden administration, then being unable to more fully assist America's European allies or do much to increase global oil and gas supplies without turning to adversaries to produce more or being rebuffed by longstanding ally Saudi Arabia.

In addition to weakening US power and influence with allies and friends, and with energy importers and energy exporters, the West's race to decarbonize is hindering

development in the poorest, energy-starved parts of the world and is ceding political and economic influence to America's competitors China and Russia. The poorest, energy-starved parts of the world are poorest primarily because they are energy starved—places where backbreaking human labor has yet to be replaced by machine labor and where on average people use only about as much electricity as a typical refrigerator consumes.[153] Such energy paucity is inconceivable to those in the developed world who have never witnessed it and cannot imagine life without the myriad time-saving and human-energy-saving conveniences of daily life, including washing machines, dishwashers, potable running water, hot water for bathing, home heating and cooling, clean cooking, dependable lighting with the flick of a switch, computers, cell phones, televisions, and refrigerators, not to mention all the electricity that powers industry, offices, schools, hospitals, and society's first-responders. Yet billions of people, especially in Africa and to a lesser degree in Asia and Latin America, live in such "unplugged" or unempowered circumstances.[154] As Alex Epstein explains, "Over three billion people live in what I call the unempowered world, where the average person uses less electricity than the average American refrigerator."[155] Billions of people spend their lives barely surviving rather than contributing to their local and national economies, much less the global economy. International development banks, such as the World Bank and the US International Development Finance Corporation (DFC), exist to further development in poor countries and once financed the building of affordable, reliable power plants. But the overreaction to climate change and efforts to decarbonize have led traditional development banks to finance unreliable renewables—solar and wind—and to move away from lending for low-cost, reliable, fossil fuel energy, especially coal-fired power plants.[156] Through its Belt and Road Initiative (BRI), China has stepped in to replace US and World Bank financing, and in the process, Beijing has strengthened its economic and political leverage over developing countries and weakened the foundations of the US-led, rules-based, liberal international order.[157]

China's banks lend primarily to make a profit and increase Beijing's geopolitical leverage, not to further development;[158] and their operations extend beyond poor countries and electricity projects to include lending to companies in wealthy nations and for all manner of projects involving fossil fuels, even as Western capitals pledge to halt public financing of fossil fuel projects and put enormous pressure on private sector banks to do the same.[159] A consortium of environmental groups released its latest report – *Banking on Climate Chaos: Fossil Fuel Finance Report 2022* – identifying twelve banks as "extreme laggards" in making the shift away from financing fossil fuel projects.[160] The twelve "extreme laggards" included nine Chinese banks: Agricultural Bank of China, Shanghai-based Bank of Communications, China Construction Bank, China Everbright, CITIC Bank, China Merchant Bank, China Minsheng, Industrial and Commercial Bank of China, and Shanghai Pudong Development Bank.[161] Even as China is lauded for its rapid expansion in solar and wind generating capacity, it continues to rely on fossil fuels for 85 percent of its energy, including 64 percent of its electricity from coal alone, helping to explain why China is the world's largest emitter of CO2.[162] China, the world's factory for unreliable renewables – solar and wind – thus uses low-cost, reliable fossil fuels to manufacture the components making Western electricity more expensive and less reliable.[163] This arrangement improves China's energy security, hurts the West's, and makes Chinese manufacturers of renewables more

competitive than their Western counterparts. All the while, Washington's climate policies are increasing Western dependence on China and strengthening Beijing's leverage over its customers for renewable energy components. Beijing is selling the West the green energy rope with which to economically hang itself.

Economics and the domestic foundations of US power

The use of energy is so inextricably bound up with economics that it is axiomatic to say energy security is national security. Professor Vaclav Smil, many of whose books emphasize the central role energy plays in economic matters, cites physicist Robert Ayres on that subject; Ayres wrote: "the economic system is essentially a system for extracting, processing and transforming energy as resources into energy embodied in products and services."[164] In *Energy and Civilization: A History*, Smil quoted another physicist, Nobel laureate Frederick Soddy, as saying "the flow of energy should be the primary concern of economics."[165]

Energy security is national security not least because modern economies are utterly dependent on energy that is reliable and affordable – two attributes the so-called green renewables—solar and wind—lack. Over the past decades, wealthy nations in the West have poured many tens of billions of dollars into subsidies and used mandates to help solar and wind compete. And still, wind and solar make up a paltry two percent of global energy use and just three percent of US energy.[166] Despite the oft heard claim that solar and wind are now cost-competitive with other ways of producing electricity, including electricity produced by coal, the reality is that such claims rely on partial-cost-accounting, leaving out the significant costs of subsidies, new and expensive power transmission lines, and, perhaps most importantly, the costs of retaining reliable backup power stations.[167]

Germany's situation is a cautionary tale for America. Germany alone has spent tens of billions of dollars on its *Energiewende* project since 2000, subsidizing wind and solar energy, and expanding its capacity to produce electricity by 73 percent.[168] Despite this enormous increase in generating capacity, Germany produced about the same amount of electricity in 2019 as it did in 2000—"less than 5 percent more than in 2000," according to Vaclav Smil.[169] Because wind power is unreliable, and solar energy produces just 11-12 percent of its installed capacity (as if solar power in Germany were useless nearly 90 percent of the time), Germany still relies heavily on fossil fuels, including coal, to generate electricity.[170] Wherever solar and wind are deployed in non-trivial amounts, energy prices skyrocket and reliability deteriorates.[171] Germans pay three times as much for electricity as the average American; and Californians, the state with the highest percentage of electricity from solar and wind, pay nearly twice as much as the US average.[172] Efforts to decommission fossil fuel and nuclear power plants in Europe have caused Germany to rely ever more heavily on neighbors Poland and the Czech Republic for backup electricity, and the unpredictability of German electricity demands stemming from the intermittency of wind and solar is destabilizing the grids and disrupting the electricity markets of Germany's neighbors.[173] Similar trends can be found in California, which experienced rolling blackouts in the summer of 2020 and is forecast to be among the states most threatened with blackouts in 2022.[174] To remain competitive, energy-intensive companies in Germany secured from

Berlin steep discounts on the price paid for electricity, while ordinary Germans footed the bill for the transition to renewables.[175] And generating electricity contributes just over twenty-five percent of greenhouse gas emissions.[176] Other energy-intensive essentials of modern civilization account for two-thirds of all greenhouse gas emissions: modern agriculture (19%), transportation (16%), and industrial processes (31%), especially the making of steel, aluminum, glass, plastics, and cement; and there is no near-term possibility of using "clean" electricity to supplant fossil fuels in these essential human activities (save perhaps nuclear energy for some industrial processes).[177] That is why Smil says the modern world is and will for decades remain a fossil-fueled civilization.[178] Even with the billions spent on its attempt to transition to "clean" energy, Germany missed its pledged reductions in greenhouse gases to such an extent the German government felt compelled to pass a decarbonization law at the end of 2021 that, according to the German newspaper *Die Welt*, would threaten Germany's ability to sustain its manufacturing-heavy, export-driven economy, even as Berlin has banned hydraulic fracturing or fracking and supported another eight billion Euros of assistance to help German industry transition away from fossil fuels.[179] As previously noted, Germany's economy is set to decline this year as it tries to wean itself from low-cost Russian oil and gas. Washington should take heed.

The Biden administration's policies favoring wind and solar power and hostile to fossil fuels were already putting a damper on US energy production before Russia invaded Ukraine and triggered a global energy crisis. On his first day in office, President Biden signed executive orders rejoining the Paris Climate Accord and halting the Keystone XL pipeline connecting Canadian oil to US Gulf Coast refineries.[180] In subsequent months, President Biden put a hold on new oil leases on federal land and blocked drilling for oil in the Arctic National Wildlife Refuge.[181] In late-October of the administration's first year, the Interior Department's Bureau of Land Management announced new, more restrictive requirements inhibiting oil and gas leases, noting "For the first time, the environmental assessments will analyze greenhouse gas emissions on a national scale and consider the *social cost* [emphasis added] of greenhouse gases."[182] In early-November, with inflation rising and gasoline prices up 30 percent since inauguration day, Biden's Energy Secretary, Jennifer Granholm, delivered remarks in Glasgow Scotland as part of a panel on "Making the Global Transition to Clean Power a Reality," in which she declared "we absolutely must cut carbon pollution, as quickly as possible" and called for "deploying more clean energy capacity."[183] The next day, she laughed off a Bloomberg reporter's question about "the Granholm plan to increase oil production in America."[184] Little wonder then that American oil and gas producers have not expanded production to address the current energy crisis stemming from Russia's war with Ukraine.[185] Within weeks after Russia's unprovoked attack on Ukraine, oil prices soared to 125 dollars per barrel, a 660 percent jump from the low point 2 years earlier when COVID lockdowns temporarily destroyed energy demand.[186] Yet, as a pair of energy experts writing in the pages of *The Wall Street Journal* observed: "Companies expect that as soon as the current turmoil subsides, the Biden administration will shift back to hostile rhetoric, anti-energy legislative proposals, and oppositional regulatory policies."[187] Twelve months into the war, the turmoil appears far from subsiding and still there is little indication the administration might prioritize energy security ahead of its climate agenda, notwithstanding the many calls for

Washington to unleash America's oil and gas potential.[188] Given the high, upfront capital costs needed to produce oil and gas and the years it takes to move from drilling to profitable operations, most energy companies are playing it safe and refusing to boost investments in production despite record high gasoline and natural gas prices.

High and rising energy prices were driving inflation in the autumn of 2021, months before Russia launched its war on Ukraine, but the war made matters much worse and threatened to spark a global economic downturn.[189] Most economists believe spiking energy prices can trigger economic recessions, but even some who place blame for recessions on contractionary policies of the US Federal Reserve note that the two together—energy price spikes and contractionary Fed policies—are a recipe for recession.[190] In the late-spring of 2022, the worst inflation in the United States in 40 years pushed the Federal Reserve to increase interest rates—a classic contractionary move that will not only slow or reverse economic growth but will ultimately lead to higher government spending to service the national debt and concomitant decreases in discretionary spending, including spending for defense. Perhaps because the situation was so extreme, it helped to unmask the centrality of energy prices, particularly oil and gas prices, to modern economies and the deleterious impacts of trying to rush the energy transition.[191] As Heather Exner-Pirot, a senior policy analyst at Canada's Macdonal-Laurier Institute, observed,

> [T]he global energy crisis impacts just about everything humans need. According to Bloomberg, energy costs will surpass 13 per cent of global GDP this year—the highest proportion in modern times. By comparison, it was less than four per cent of global GDP in 2020, and 6.5 per cent in 2021.
>
> That nine per cent of global GDP, which represents about $8.5 trillion, could have been spent on education, health, infrastructure, housing or other important measures. Instead, it has been siphoned off into spiralling energy costs created not from a lack of energy resources, but from climate policies that intentionally reduced their supply by limiting investment and rejecting new exploration, infrastructure and production.[192]

And while accepting some degree of higher energy prices and attendant diminution in the performance of the economy might be an acceptable price for heading off a looming catastrophe (such as a war or the spread of a pandemic), the easily mastered changes in Earth's climate do not. The extreme jumps in energy prices and inflation and threat to economic wellbeing are not a justification for doubling down on rushing the transition to whatever comes next after fossil fuels by mandating and subsidizing today's so called "clean" energy or "green" energy technology. The extreme situation is instead vindication of for those like Bjorn Lomborg, Vaclav Smil, Michael Schellenberger, Alex Epstein, Mark Mills, and Marc Morano who argue that physics and real-world economics dictate a more gradual, natural, and affordable energy transition.[193] In short, the overreaction to climate change hurts America's energy security and damages the US economy; Russia's war against Ukraine just made that fact more obvious.

Finally, US and other Western promises to decarbonize by 2050, or by 2035, resulting from the West's overreaction to climate change are so utterly unrealistic that the failure to deliver on those promises is calling into question the very legitimacy and efficacy of the political and economic systems underpinning the freest, most democratic, and most prosperous countries in the world. In the weeks before the December 2021 UN Conference of Parties summit (COP26) in Glasgow Scotland, Swedish teenager and

climate activist Greta Thunberg mocked world leaders' decades' of bloviating without effective action as so much "blah, blah, blah" and President Biden's Build Back Better plan as "Build back better, blah, blah, blah."[194] Such criticisms are perhaps emblematic of the younger generation's loss of confidence in its political leaders' will or ability to address the alleged dangers of climate change, but the loss of confidence is not limited to the young as seasoned academics and think-tank analysts call for strong (even radical) measures to ensure the climate gets "fixed." A decade ago, Shirley Scott, an associate professor of International Relations at the University of New South Wales, Sydney, was already exploring "what role the United Nations Security Council might assume in climate change governance."[195] Scott was writing about the possibility of Security Council action under the UN Charter's Chapter VII, authorizing military action to enforce the Council's resolutions.[196] More recently, Nils Gilman and Jonathan Blake of the Los Angeles-based Berggruen Institute have called for new supranational structures (outside the United Nations system) with the authority to address planetary challenges because the authors believe nation-states have proven themselves unequal to the task. Writing in the spring of 2021 they declared:

> If we've learned one lesson from the pandemic, it's that nation-states don't govern well at the planetary level or at the local level. The same is true for other planetary phenomena like climate change. …. Solving these twin crises of ineffective and illegitimate governance requires a fundamental restructuring of our governing institutions. In particular, it requires stripping the nation-state of many of its powers and governance functions, moving some up to planetary institutions and others down to local institutions.[197]

An article in the *American Political Science Review*, published in December 2021 amidst the surge in the COVID-19 pandemic caused by the omicron variant of the COVID virus, argued "Climate change poses and even graver threat to public safety [than does the COVID-19 pandemic]."[198] And that contrary to normal times when basic individual rights and democratic governance ought to be respected, in this threatening era of climate change "political legitimacy may not only be compatible with authoritarian governance but actually *require* it."[199] According to the author, "ensuring safety and security may, at times, justify relaxing or suspending strict adherence to certain democratic processes or individual rights."[200] Lamentably, at least from that author's viewpoint, "Free-speech rights in many countries have made regulating harmful climate denial and disinformation campaigns virtually impossible."[201] Meanwhile, British political scientist Anatol Lieven wrote a book in 2020, *Climate Change and the Nation State*, praising the Green New Deal and asserting, *inter alia*, "radical economic reforms…will be required," and "there is no way to limit climate change without massive state intervention in the economy."[202] Some observers perceive the beginnings of such environmental authoritarianism in Washington's creeping arrogation of powers over individual freedoms and portions of the US economy, such as through the creation of a new Office of Climate Change and Health Equity within the Department of Health and Human Services (HHS) to fight climate change, the attempt to establish the Orwellian sounding Disinformation Governance Board within the Department of Homeland Security, and President Biden's subsequent "use of the Defense Production Act (DPA) to accelerate domestic production of clean energy technologies, including solar panel parts….Building insulation…Heat pumps… Equipment for making and

using clean electricity-generated fuels, …and Critical power grid infrastructure like transformers."[203] In addition to invoking the DPA, the White House claimed "President Biden is also putting *the full power of federal procurement* [emphasis added] to work spurring additional domestic solar manufacturing capacity."[204] And, despite a July 2022 Supreme Court ruling against the bureaucratic overreach of the Environmental Protection Agency (EPA) in *West Virginia vs. EPA*, within a week of that opinion the Secretary of Transportation appeared to flout the high court's ruling when he laid out new rules that would force states to cut CO2 emissions along US highways.[205] Such apparently blatant disregard for the Supreme Court, if sustained, could only serve to weaken America's constitutional order.[206] Thus, the rhetorical overreaction to climate change – overstating its dangers as well as what can and will be done about it – appears to be generating responses outside and inside the US government that threaten to undermine the foundations of American sovereignty, political legitimacy, democratic processes, economic prosperity, and individual rights and freedoms. Put simply, Washington's overreaction to climate change is weakening the economic and political systems of the freest, most democratic, and prosperous countries in the world.

Conclusion

Contrary to the prevailing narrative that manmade greenhouse gases are bringing on a climate catastrophe and that the only way to avoid that catastrophe is through rapid decarbonization of the global economy, there is nothing to fear at present from mildly rising temperatures and slowly increasing CO2 levels. Life on Earth first developed then thrived at higher temperatures and much higher levels of CO2 than exist today; and so far, all evidence suggests that slightly rising temperatures and CO2 levels are and will continue to be a net good—helping to decrease weather-related deaths and increase agricultural output. Forecasts of doom are based on unreliable models, not on any substantiation in the climate record. Exaggerations of the alleged problem, the putative scientific consensus on it, and humankind's ability to affect it have led to an overreaction that threatens US national security far more than the climate does. The supposed cure – decarbonization – is already damaging the American and other Western economies without any compensating benefit to the environment. A continuation of efforts to transition rapidly away from fossil fuels would waste vast sums of money America does not have and would fail to meaningfully "fix" the climate. Furthermore, an aggressive policy of decarbonization would deprive the developed world of the resources needed to most effectively grow its economies, adapt to and master the effects of Earth's constantly changing climate, and would condemn those in the developing world to a future of poverty and misery. America's adversaries know this and are happy to see the United States and its allies weaken themselves, while those adversaries gain power and increase their leverage over developing countries. American power projection capabilities and combat power will remain dependent on fossil fuels for decades to come and any attempt to force a shift away from fossil fuels can only come at the expense of wasted dollars and decreased combat capability. It is time to recognize that the climate is not a threat to US national security, but the current overreaction to the constantly changing climate is. Washington should stop overreacting; it should stop trying to force an energy transition that is not presently

needed, is not affordable, cannot currently be achieved, and will do little if anything to move the needle on Earth's temperature by this century's end.

Notes

1. Pun intended. The first part of this paper will provide ample evidence of the debate.
2. United Nations Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis, Summary for Policy Makers* (hereafter UN IPCC AR6 WGI SPM), 5. https://www.ipcc.ch/report/ar6/wg1/#SPM.
3. Brian Fagan, *The Little Ice Age: How Climate Made History 1300-1850* (New York: Basic Books, 2000); and John P. Rafferty and Stephen T. Jackson, "Little Ice Age," *Encyclopedia Britannica*, March 18, 2016, accessed March 4, 2022, https://www.britannica.com/science/Little-Ice-Age.
4. Steven E. Koonin, *Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters* (Dallas, Texas: BenBella Books, 2021), 26-27 and 36; S. Fred Singer, *Hot Talk, Cold Science: Global Warming's Unfinished Debate* (Oakland, Calif.: Independent Institute, 2021), 91 and 94; Matt Ridley, "Whatever Happened to Global Warming?" *The Wall Street Journal,* September 5, 2014, A15, https://www.wsj.com/articles/matt-ridley-whatever-happened-to-global-warming-1409872855.
5. Koonin, *Unsettled*, 26-27 and 36; and Singer, *Hot Talk, Cold Science*, 91 and 94. Note that Singer supports his claims using data from the Hadley Centre of the UK Met Office and University of East Anglia Climatic Research Unit (CRU) and a graphical depiction of global temperatures can be found here: https://crudata.uea.ac.uk/~timo/diag/tempts_12mon-running_global.png.
6. Singer, *Hot Talk, Cold Science*, 30; Koonin, *Unsettled*, 88, Figure 4.3; "Not So Hot," *The Wall Street Journal*, August 29, 2007, https://www.wsj.com/articles/SB118835472067611877.
7. Ridley, "Whatever Happened to Global Warming?"; Koonin, *Unsettled*, 26-27, and 36; Singer, *Hot Talk, Cold Science*, 91 and 94.
8. Central Intelligence Agency, *A Study of Climatological Research as it Pertains to Intelligence Problems* (Washington, DC: CIA, 1974), 2-6. https://www.governmentattic.org/18docs/CIAclimateResearchIntellProbs_1974.pdf.
9. Koonin, *Unsettled*, 26-27 and 36; Singer, *Hot Talk, Cold Science*, 91 and 94. Although no source is cited, former US Vice President Al Gore shows the same global temperature trends in a chart on page 96 of his seminal book *Earth in the Balance*. See Senator Al Gore, *Earth in the Balance: Ecology and the Human Spirit* (New York: Houghton Mifflin, 1992), 96.
10. Koonin, *Unsettled,* 26-27 and 36; Singer, *Hot Talk, Cold Science*, 94-95; Morano, *The Politically Incorrect Guide to Climate Change* (USA: Regnery, 2018), 21-26. Morano dates the birth of global warming to Senate committee hearings on global warming in 1988 orchestrated by Senators Al Gore and Timothy Wirth and the 1989 establishment of the United Nations Intergovernmental Panel on Climate Change.
11. "Keeping Cool About Hot Temperatures," *The Wall Street Journal*, January 19, 2017, https://www.wsj.com/articles/keeping-cool-about-hot-temperatures-1484871286.
12. Ridley, "Whatever Happened to Global Warming?"; Judith Curry, "The Global Warming Statistical Meltdown," *The Wall Street Journal,* October 9, 2014, https://www.wsj.com/articles/judith-curry-the-global-warming-statistical-meltdown-1412901060; "Keeping Cool About Hot Temperatures,"; David Whitehouse, "The death of the global warming 'pause' has been greatly exaggerated," *The Spectator* (UK), January 6, 2017, https://archive.ph/nAMvs#selection-2237.0-2565.107; Morano, *The Politically Incorrect Guide*, Chapter 7: The Long Cool Pause, 97-108. Although somewhat more equivocal, support for the hiatus in warming can found in this UN IPCC AR5 report published in 2015: United Nations Intergovernmental Panel on Climate Change, *Climate Change 2014 Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the*

Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 2015 (hereafter *IPCC Climate Change 2014 Synthesis Report*), 2-4, https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf.

13. Morano, *The Politically Incorrect Guide*, 61.
14. Michael Bastasch, "Satellites Show 2016 Tied 1998 for Warmest Year on Record," *Daily Caller,* January 3, 2017, https://climatechangedispatch.com/satellites-show-2016-tied-1998-for-warmest-year-on-record/; Koonin, *Unsettled*, 19; and "Keeping Cool About Hot Temperatures."
15. Bastasch, "Satellites Show 2016 Tied 1998;" and "Keeping Cool About Hot Temperatures."
16. Koonin, *Unsettled,* Chapter 4: Many Muddled Models, *77*-96; and Robert Lee Hotz, "Climate Scientists Encounter Limits of Computer Models, Bedeviling Policy," *Wall Street Journal*, February 7, 2022, A1 and A9, https://www.wsj.com/articles/climate-change-global-warming-computer-model-11642191155.
17. Koonin, *Unsettled,* Chapter 2: Humble Human Influences, 45-59; and Singer, *Hot Talk, Cold Science*, 92-97.
18. Koonin, *Unsettled*, 4-5, 18-21, 96-98, 177-178, and 253-254; and Singer, *Hot Talk, Cold Science*, 28-36, 92-97 and 107-115.
19. B. Moore III, et al. "Advancing Our Understanding," IPCC TAR-4, March 2018, 774, https://www.ipcc.ch/site/assets/uploads/2018/03/TAR-14.pdf; cited in Patrick Moore, *Fake Invisible Catastrophes and Threats of Doom* (NP: Ecosense Environmental, 2021), 51.
20. Joseph Bast And Roy Spencer, "The Myth of the Climate Change '97%'," *The Wall Street Journal*, May 27, 2014, A13, https://www.wsj.com/articles/SB10001424052702303480304579578462813553136; Koonin, *Unsettled,* 203; Christopher Monckton, "Honey, I shrunk the consensus," *JoNova Blog*, September 24, 2013, https://joannenova.com.au/2013/09/monckton-honey-i-shrunk-the-consensus/; Lawrence Solomon, "Lawrence Solomon: 75 climate scientists think humans contribute to global warming," *National Post* (Canada), December 30, 2010, https://nationalpost.com/full-comment/lawrence-solomon-75-climate-scientists-think-humans-contribute-to-global-warming?r; Singer, *Hot Talk, Cold Science*, 55-70; Morano, *The Politically Incorrect Guide*, 27-39; Gregory Wrightstone, *Inconvenient Facts: The science that Al Gore doesn't want you to know* (USA: Silver Crown Productions, 2017), 59-64.
21. Morano, *The Politically Incorrect Guide*, 36-37; and Wrightstone, *Inconvenient Facts*, 59-64.
22. Singer, *Hot Talk, Cold Science*, 68-70, 74, 78, and 187-189; Morano, *The Politically Incorrect Guide*, 27-39 and 119-141; and Koonin, *Unsettled*, 1-16.
23. Koonin, *Unsettled*, 178.
24. Roger Pielke Jr., "My Unhappy Life as a Climate Heretic," *The Wall Street Journal*, Dec. 2, 2016, https://www.wsj.com/articles/my-unhappy-life-as-a-climate-heretic-1480723518; Singer, *Hot Talk, Cold Science,* 188; Koonin, *Unsettled*, 15-16.
25. Alex Epstein, *Fossil Future: Why Global Human Flourishing Requires More Oil, Coal, and Natural Gas—Not Less* (New York: Penguin Random House, 2022), 303-305; *Climate Hustle*, documentary, directed by Chris Rogers (Np: CDR Communications, 2016), DVD; Marc Morano, with Foreword by Mark Steyn, *Green Fraud: Why the Green New Deal Is Even Worse Than You Think* (USA: Regnery Publishing, 2021); and Morano, *The Politically Incorrect Guide*. Each of these last three sources is full of quotes by distinguished scientists challenging the prevailing narrative about the supposed looming, manmade, climate catastrophe. Nearly all of those scientists were professors emeritus, retired, or approaching retirement.
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27. Steven Koonin speaking at a symposium "Energy and the Current Narrative: Fireside Chat with Chris Wright and Dr. Steven Koonin" on YouTube, June 29, 2021, by Liberty Oilfield Services (10:15/1:04:33), https://www.youtube.com/watch?v=nizA7hjZg9c.

28. Koonin, *Unsettled*, 179-181; and Koonin, "Energy and the Current Narrative." Bjorn Lomborg also draws on Nordhaus's work and shows similar results, see Chapter 5: What Is Global Warming Going to Cost Us? in Bjorn Lomborg, *False Alarm: How Climate Change Panic Costs Us Trillions, Hurts the Poor, and Fails to Fix the Planet* (New York: Basic Books, 2020), 77-86.
29. Moore, *Fake Invisible Catastrophes*; Singer, *Hot Talk, Cold Science*; Morano, *The Politically Incorrect Guide*; Wrightstone, *Inconvenient Facts*; Lomborg, *False Alarm*; Epstein, *Fossil Future*.
30. Lomborg, *False Alarm*, 73; Epstein, *Fossil Future*, 260-266. See also Koonin, *Unsettled*, 169. A Reason Foundation study in 2011 put the decline in annual aggregate mortality rates for all extreme weather events globally from 1900-2010 at 98 percent, see Indur M. Goklany, "Wealth and Safety: The Amazing Decline in Deaths from Extreme Weather in an Era of Global Warming, 1900–2010," *Reason*, Policy Study 393 (September 2011), Executive Summary and p. 15, https://reason.org/wp-content/uploads/2011/09/deaths_from_extreme_weather_1900_2010.pdf.
31. Michael Schellenberger, *Apocalypse Never: Why Environmental Alarmism Hurts Us All* (New York: HarperCollins, 2020); Moore, *Fake Invisible Catastrophes*; Singer, *Hot Talk, Cold Science*; Morano, *Politically Incorrect Guide*; Wrightstone, *Inconvenient Facts*; Lomborg, *False Alarm*; Epstein, *Fossil Future*.
32. Koonin, *Unsettled*, chapters 5-9, 97-183; Singer, *Hot Talk, Cold Science*, esp. chapters 7-13, 87-160; Moore, *Fake Invisible Catastrophes*, esp. chapters II-V, 19-101 and IX-XI, 161-198; Lomborg, *False Alarm*, Introduction and chapters 1-4, 3-76; and Schellenberger, *Apocalypse Never*, esp. chapters 1-2, 1-44; and chapter 4, 65-84.
33. Koonin, *Unsettled*, Chapter 4: Many Muddled Models, 77-96; Singer, *Hot Talk, Cold Science*, 117-124.
34. Koonin, *Unsettled*, chapters 5-9, 97-183; Singer, *Hot Talk, Cold Science*, esp. chapters 7-13 and 15; Moore, *Fake Invisible Catastrophes*, esp. chapters II-V and IX-XI; Lomborg, *False Alarm*, Introduction and chapters 1-4; Wrightstone, *Inconvenient Facts*; Schellenberger, *Apocalypse Never*, esp. chapters 1-2 and 4; Epstein, *Fossil Future*, esp. chapters 2, 8 and 9; Morano, *The Politically Incorrect Guide*; and Morano, *Green Fraud*, esp. chapter 3.
35. Richard S. Lindzen, "Global Warming: How to Approach the Science," Testimony: House Subcommittee on Science and Technology hearing on A Rational Discussion of Climate Change: the Science, the Evidence, the Response, November 17, 2010, slide 14, https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/hearings/111710Lindzen.pdf.
36. United Nations, "Secretary-General Calls Latest IPCC Climate Report 'Code Red for Humanity', Stressing 'Irrefutable' Evidence of Human Influence," Press Release SG/SM/20847, United Nations, August 9, 2021, https://press.un.org/en/2021/sgsm20847.doc.htm#.
37. Steven Koonin, interview with The Wall Street Journal's Paul Gigot, "What Climate Science Knows—and Doesn't Know," Journal Editorial Report, a short video (6:49) linked inside the editorial "A Climate of Catastrophe," *The Wall Street Journal*, August 9, 2021, https://www.wsj.com/articles/a-climate-of-catastrophe-united-nations-intergovernmental-panel-on-climate-change-report-11628546180.
38. United Nations Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis, Summary for Policy Makers*, August 7, 2021 (hereafter *IPCC AR6 WGI SPM*), 5-7, https://www.ipcc.ch/report/ar6/wg1/#SPM; Ronan Connolly, et al., "How much has the Sun influenced Northern Hemisphere temperature trends? An ongoing debate," *Research in Astronomy and Astrophysics,* Vol. 21, No. 6, 131 (August 2021), 131-1 thru 131-2, and 131-57 thru 131-59, doi: 10.1088/1674-4527/21/6/131, https://iopscience.iop.org/article/10.1088/1674-4527/21/6/131/pdf; Alex Newman, "Study Finds Sun—Not CO2—May Be Behind Global Warming," *The Epoch Times*, August 16, 2021, https://www.theepochtimes.com/challenging-un-study-finds-sun-not-co2-may-be-behind-global-warming_3950089.html; Kenneth Skrable, George Chabot, and Clayton French, "World Atmospheric CO2, Its ^{14}C Specific Activity, Non-fossil Component, Anthropogenic

Fossil Component, and Emissions (1750-2018), *Health Physics* Vol. 122, Iss. 2 (February 2022), 291-305, https://journals.lww.com/health-physics/Abstract/2022/02000/World_Atmospheric_CO2,_Its_14C_Specific_Activity,.2.aspx. The study by Skrable, Chabot and French contradicted the August 2021 claim in the UN IPCC's *Summary for Policy Makers* that the "total human-caused global surface temperature increase from 1850–1900 to 2010–2019" accounted for 100 percent of the warming and that natural causes of warming since the Little Ice Age contributed nothing.

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41. Skrable, Chabot, and French, "World Atmospheric CO2," 291, 292, and 303.
42. Skrable, Chabot, and French, "World Atmospheric CO2," 302.
43. Skrable, Chabot, and French, "World Atmospheric CO2," 291.
44. Moore, *Fake Invisible Catastrophes*, 40-42; Wrightstone, *Inconvenient Facts*, 15-17.
45. Moore, *Fake Invisible Catastrophes*, 41.
46. Moore, *Fake Invisible Catastrophes*, 41.
47. Skrable, Chabot, and French, "World Atmospheric CO2," 292.
48. Skrable, Chabot, and French, "World Atmospheric CO2," 292.
49. Moore, *Fake Invisible Catastrophes*, 43 and 67; Richard S. Lindzen, "Global Warming: How to Approach the Science,"2010, slide 25; Singer, *Hot Talk, Cold Science*, 90; and Skrable, Chabot, and French, "World Atmospheric CO2," 292.
50. Moore, *Fake Invisible Catastrophes*, 64-67.
51. Skrable, Chabot, and French, "World Atmospheric CO2," 292.
52. Koonin, *Unsettled,* 51; Moore, *Fake Invisible Catastrophes*, 47.
53. Koonin, *Unsettled*, 50-54.
54. Koonin, *Unsettled*, 52-54.
55. Koonin interview with Gigot, "What Climate Science Knows—and Doesn't Know."
56. "There is 'nothing bad' about increasing carbon dioxide: William Happer," interview for The Bolt Report, Sky News Australia, April 22, 2021, YouTube (9:20), https://www.youtube.com/watch?v=Wbs8whRlzn0.
57. Lomborg, *False Alarm*, 124-148.
58. Lomborg, *False Alarm*, 119-120. See also, Koonin, "Energy and the Current Narrative."
59. Lomborg, *False Alarm*, 131.
60. Lomborg, *False Alarm*, 120.
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