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### Advantage One is DERS

#### Runaway warming causes extinction

Sears 21 [Nathan Alexander Sears, PhD Candidate in Political Science at The University of Toronto, Former Professor of International Relations at the Universidad de Las Américas, Trudeau Fellow in Peace, Conflict and Justice at the Munk School of Global Affairs, “Great Powers, Polarity, and Existential Threats to Humanity: An Analysis of the Distribution of the Forces of Total Destruction in International Security”, Conference Paper: International Studies Association, 2021 Annual Conference, March/April 2021, https://tinyurl.com/bfbfspzx]

*Climate Change*

Humanity faces existential risks from the large-scale destruction of Earth’s natural environment making the planet less hospitable for humankind (Wallace-Wells 2019). The decline of some of Earth’s natural systems may already exceed the “planetary boundaries” that represent a “safe operating space for humanity” (Rockstrom et al. 2009). Humanity has become one of the driving forces behind Earth’s climate system (Crutzen 2002). The major anthropogenic drivers of climate change are the burning of fossil fuels (e.g., coal, oil, and gas), combined with the degradation of Earth’s natural systems for absorbing carbon dioxide, such as deforestation for agriculture (e.g., livestock and monocultures) and resource extraction (e.g., mining and oil), and the warming of the oceans (Kump et al. 2003). While humanity has influenced Earth’s climate since at least the Industrial Revolution, the dramatic increase in greenhouse gas emissions since the mid-twentieth century—the “Great Acceleration” (Steffen et al. 2007; 2015; McNeill & Engelke 2016)— is responsible for contemporary climate change, which has reached approximately 1°C above preindustrial levels (IPCC 2018).

Climate change could become an existential threat to humanity if the planet’s climate reaches a “Hothouse Earth” state (Ripple et al. 2020). What are the dangers? There are two mechanisms of climate change that threaten humankind. The direct threat is extreme heat. While human societies possesses some capacity for adaptation and resilience to climate change, the physiological response of humans to heat stress imposes physical limits—with a hard limit at roughly 35°C wet-bulb temperature (Sherwood et al. 2010). A rise in global average temperatures by 3–4°C would increase the risk of heat stress, while 7°C could render some regions uninhabitable, and 11–12°C would leave much of the planet too hot for human habitation (Sherwood et al. 2010). The indirect effects of climate change could include, inter alia, rising sea levels affecting coastal regions (e.g., Miami and Shanghai), or even swallowing entire countries (e.g., Bangladesh and the Maldives); extreme and unpredictable weather and natural disasters (e.g., hurricanes and forest fires); environmental pressures on water and food scarcity (e.g., droughts from less-dispersed rainfall, and lower wheat-yields at higher temperatures); the possible inception of new bacteria and viruses; and, of course, large-scale human migration (World Bank 2012; Wallace-Well 2019; Richards, Lupton & Allywood 2001). While it is difficult to determine the existential implications of extreme environmental conditions, there are historic precedents for the collapse of human societies under environmental pressures (Diamond 2005). Earth’s “big five” mass extinction events have been linked to dramatic shifts in Earth’s climate (Ward 2008; Payne & Clapham 2012; Kolbert 2014; Brannen 2017), and a Hothouse Earth climate would represent terra incognita for humanity.

Thus, the assumption here is that a Hothouse Earth climate could pose an existential threat to the habitability of the planet for humanity (Steffen et al. 2018., 5). At what point could climate change cross the threshold of an existential threat to humankind? The complexity of Earth’s natural systems makes it extremely difficult to give a precise figure (Rockstrom et al. 2009; ). However, much of the concern about climate change is over the danger of crossing “tipping points,” whereby positive feedback loops in Earth’s climate system could lead to potentially irreversible and self-reinforcing “runaway” climate change. For example, the melting of Arctic “permafrost” could produce additional warming, as glacial retreat reduces the refractory effect of the ice and releases huge quantities of methane currently trapped beneath it. A recent study suggests that a “planetary threshold” could exist at global average temperature of 2°C above preindustrial levels (Steffen et al. 2018; also IPCC 2018). Therefore, the analysis here takes the 2°C rise in global average temperatures as representing the lower-boundary of an existential threat to humanity, with higher temperatures increasing the risk of runaway climate change leading to a Hothouse Earth.

The Paris Agreement on Climate Change set the goal of limiting the increase in global average temperatures to “well below” 2°C and to pursue efforts to limit the increase to 1.5°C. If the Paris Agreement goals are met, then nations would likely keep climate change below the threshold of an existential threat to humanity. According to Climate Action Tracker (2020), however, current policies of states are expected to produce global average temperatures of 2.9°C above preindustrial levels by 2100 (range between +2.1 and +3.9°C), while if states succeed in meeting their pledges and targets, global average temperatures are still projected to increase by 2.6°C (range between +2.1 and +3.3°C). Thus, while the Paris Agreements sets a goal 6 that would reduce the existential risk of climate change, the actual policies of states could easily cross the threshold that would constitute an existential threat to humanity (CAT 2020).

#### And, triggers multiple nuclear hotspots in Southeast Asia, Siberia, and the Arctic.

Klare 20 [Michael, The Nation’s defense correspondent, is professor emeritus of peace and world-security studies at Hampshire College and senior visiting fellow at the Arms Control Association in Washington, D.C. “How Rising Temperatures Increase the Likelihood of Nuclear War”. 1/13/20. https://www.thenation.com/article/archive/nuclear-defense-climate-change/]

President Donald Trump may not accept the scientific reality of climate change, but the nation’s senior military leaders recognize that climate disruption is already underway, and they are planning extraordinary measures to prevent it from spiraling into nuclear war. One particularly worrisome scenario is if extreme drought and abnormal monsoon rains devastate agriculture and unleash social chaos in Pakistan, potentially creating an opening for radical Islamists aligned with elements of the armed forces to seize some of the country’s 150 or so nuclear weapons. To avert such a potentially cataclysmic development, the US Joint Special Operations Command has conducted exercises for infiltrating Pakistan and locating the country’s nuclear munitions. Most of the necessary equipment for such raids is already in position at US bases in the region, according to a 2011 report from the nonprofit Nuclear Threat Initiative. “It’s safe to assume that planning for the worst-case scenario regarding Pakistan’s nukes has already taken place inside the US government,” said Roger Cressey, a former deputy director for counterterrorism in Bill Clinton’s and George W. Bush’s administrations in 2011.

Such an attack by the United States would be an act of war and would entail enormous risks of escalation, especially since the Pakistani military—the country’s most powerful institution—views the nation’s nuclear arsenal as its most prized possession and would fiercely resist any US attempt to disable it. “These are assets which are the pride of Pakistan, assets which are…guarded by a corps of 18,000 soldiers,” former Pakistani president Pervez Musharraf told NBC News in 2011. The Pakistani military “is not an army which doesn’t know how to fight. This is an army that has fought three wars. Please understand that.”

A potential US military incursion in nuclear-armed Pakistan is just one example of a crucial but little-​discussed aspect of international politics in the early 21st century: how the acceleration of climate change and nuclear war planning may make those threats to human survival harder to defuse. At present, the intersections between climate change and nuclear war might not seem obvious. But powerful forces are pushing both threats toward their most destructive outcomes.

Harry Reid Understood Power

In the case of climate change, the unbridled emission of carbon dioxide and other greenhouse gases is raising global temperatures to unmistakably dangerous levels. Despite growing worldwide reliance on wind and solar power for energy generation, the global demand for oil and natural gas continues to rise, and carbon emissions are projected to remain on an upward trajectory for the foreseeable future. It is highly unlikely, then, that the increase in average global temperature can be limited to 1.5 degrees Celsius, the aspirational goal adopted by the world’s governments under the Paris Agreement in 2015, or even to 2°C, the actual goal. After that threshold is crossed, scientists agree, it will prove almost impossible to avert catastrophic outcomes, such as the collapse of the Greenland and Antarctic ice sheets and a resulting sea level rise of 6 feet or more.

Climbing world temperatures and rising sea levels will diminish the supply of food and water in many resource-deprived areas, increasing the risk of widespread starvation, social unrest, and human flight. Global corn production, for example, is projected to fall by as much as 14 percent in a 2°C warmer world, according to research cited in a 2018 special report by the UN’s Intergovernmental Panel on Climate Change (IPCC). Food scarcity and crop failures risk pushing hundreds of millions of people into overcrowded cities, where the likelihood of pandemics, ethnic strife, and severe storm damage is bound to increase. All of this will impose an immense burden on human institutions. Some states may collapse or break up into a collection of warring chiefdoms—all fighting over sources of water and other vital resources.

A similar momentum is now evident in the emerging nuclear arms race, with all three major powers—China, Russia, and the United States—rushing to deploy a host of new munitions. This dangerous process commenced a decade ago, when Russian and Chinese leaders sought improvements to their nuclear arsenals and President Barack Obama, in order to secure Senate approval of the New Strategic Arms Reduction Treaty of 2010, agreed to initial funding for the modernization of all three legs of America’s strategic triad, which encompasses submarines, intercontinental ballistic missiles, and bombers. (New START, which mandated significant reductions in US and Russian arsenals, will expire in February 2021 unless renewed by the two countries.) Although Obama initiated the modernization of the nuclear triad, the Trump administration has sought funds to proceed with their full-scale production, at an estimated initial installment of $500 billion over 10 years.

Even during the initial modernization program of the Obama era, Russian and Chinese leaders were sufficiently alarmed to hasten their own nuclear acquisitions. Both countries were already in the process of modernizing their stockpiles—Russia to replace Cold War–era systems that had become unreliable, China to provide its relatively small arsenal with enhanced capabilities. Trump’s decision to acquire a whole new suite of ICBMs, nuclear-armed submarines, and bombers has added momentum to these efforts. And with all three major powers upgrading their arsenals, the other nuclear-weapon states—led by India, Pakistan, and North Korea—have been expanding their stockpiles as well. Moreover, with Trump’s recent decision to abandon the Intermediate-Range Nuclear Forces (INF) Treaty, all major powers are developing missile delivery systems for a regional nuclear war such as might erupt in Europe, South Asia, or the western Pacific.

Runaway warming: Expanses of ice are melting at unprecedented rates, with potentially grim geopolitical repercussions. (David Silverman / Getty Images)

All things being equal, rising temperatures will increase the likelihood of nuclear war, largely because climate change will heighten the risk of social stress, the decay of nation-states, and armed violence in general, as I argue in my new book, All Hell Breaking Loose. As food and water supplies dwindle and governments come under ever-increasing pressure to meet the vital needs of their populations, disputes over critical resources are likely to become more heated and violent, whether the parties involved have nuclear arms or not. But this danger is compounded by the possibility that several nuclear-armed powers—notably India, Pakistan, and China—will break apart as a result of climate change and accompanying battles over disputed supplies of water.

Together, these three countries are projected by the UN Population Division to number approximately 3.4 billion people in 2050, or 34 percent of the world’s population. Yet they possess a much smaller share of the world’s freshwater supplies, and climate change is destined to reduce what they have even further. Warmer temperatures are also expected to diminish crop yields in these countries, adding to the desperation of farmers and very likely resulting in widespread ethnic strife and population displacement. Under these circumstances, climate-related internal turmoil would increase the risk of nuclear war in two ways: by enabling the capture of nuclear arms by rogue elements of the military and their possible use against perceived enemies and by inciting wars between these states over vital supplies of water and other critical resources.

The risk to Pakistan from climate change is thought to be particularly acute. A large part of the population is still engaged in agriculture, and much of the best land—along with access to water—is controlled by wealthy landowners (who also dominate national politics). Water scarcity and mismanagement is a perennial challenge, and climate change is bound to make the problem worse. Climate and Social Stress: Implications for Security Analysis, a 2013 report by the National Research Council for the US intelligence community, highlights the danger of chaos and conflict in that country as global warming advances. Pakistan, the report notes, is expected to suffer from inadequate water supplies during the dry season and severe flooding during the monsoon—outcomes that will devastate its agriculture and amplify the poverty and unrest already afflicting much of the country. “The Pakistan case,” the report reads, “illustrates how a highly stressed environmental system on which a tense society depends can be a source of political instability and how that source can intensify when climate events put increased stress on the system.” Thus, as global temperatures rise and agriculture declines, Pakistan could shatter along ethnic, class, and religious lines, precisely the scenario that might trigger the sort of intervention anticipated by the US Joint Special Operations Command.

Assuming that Pakistan remains intact, another great danger arising from increasing world temperatures is a conflict between it and India or between China and India over access to shared river systems. Whatever their differences, Pakistan and western India are forced by geography to share a single river system, the Indus, for much of their water requirements. Likewise, western China and eastern India also share a river, the Brahmaputra, for their vital water needs. The Indus and the Brahmaputra obtain much of their flow from periods of heavy precipitation; they also depend on meltwater from Himalayan glaciers, and these are at risk of melting because of rising temperatures. According to the IPCC, the Himalayan glaciers could lose as much as 29 percent of their total mass by 2035 and 78 percent by 2100. This would produce periodic flooding as the ice melts but would eventually result in long periods of negligible flow, with calamitous consequences for downstream agriculture. The widespread starvation and chaos that could result would prove daunting to all the governments involved and make any water-related disputes between them a potential flash point for escalation.

As in Pakistan, water supply has always played a pivotal role in the social and economic life of China and India, with both countries highly dependent on a few major river systems for civic and agricultural purposes. Excessive rainfall can lead to catastrophic flooding, and prolonged drought has often led to widespread famine and mass starvation. In such a setting, water management has always been a prime responsibility of government—and a failure to fulfill this function effectively has often resulted in civil unrest. Climate change is bound to increase this danger by causing prolonged water shortages interspersed with severe flooding. This has prompted leaders of both countries to build ever more dams on all key rivers.

India, as the upstream power on several tributaries of the Indus, and China, as the upstream power on the Brahmaputra, have considered damming these rivers and diverting their waters for exclusive national use, thereby diminishing the flow to downstream users. Three of the Indus’s principal tributaries, the Jhelum, Chenab, and Ravi rivers, flow through Indian-controlled Kashmir (now in total lockdown, with government forces suppressing all public functions). It’s possible that India seeks full control of Kashmir in order to dam the tributaries there and divert their waters from Pakistan—a move that could easily trigger a war if it occurs at a time of severe food and water stress and one that would very likely invite the use of nuclear weapons, given Pakistan’s attitude toward them.

The situation regarding the Brahmaputra could prove equally precarious. China has already installed one dam on the river, the Zangmu Dam in Tibet, and has announced plans for several more. Some Chinese hydrologists have proposed the construction of canals linking the Brahmaputra to more northerly rivers in China, allowing the diversion of its waters to drought-stricken areas of the heavily populated northeast. These plans have yet to come to fruition, but as global warming increases water scarcity across northern China, Beijing might proceed with the idea. “If China was determined to move forward with such a scheme,” the US National Intelligence Council warned in 2009, “it could become a major element in pushing China and India towards an adversarial rather than simply a competitive relationship.”

Severe water scarcity in northern China could prompt yet another move with nuclear implications: an attempted annexation by China of largely uninhabited but water-rich areas of Russian Siberia. Thousands of Chinese farmers and merchants have already taken up residence in eastern Siberia, and some commentators have spoken of a time when climate change prompts a formal Chinese takeover of those areas—which would almost certainly prompt fierce Russian resistance and the possible use of nuclear weapons.

In the Arctic, global warming is producing a wholly different sort of peril: geopolitical competition and conflict made possible by the melting of the polar ice cap. Before long, the Arctic ice cap is expected to disappear in summertime and to shrink noticeably in the winter, making the region more attractive for resource extraction. According to the US Geological Survey, an estimated 30 percent of the world’s remaining undiscovered natural gas is above the Arctic Circle; vast reserves of iron ore, uranium, and rare earth minerals are also thought to be buried there. These resources, along with the appeal of faster commercial shipping routes linking Europe and Asia, have induced all the major powers, including China, to establish or expand operations in the region. Russia has rehabilitated numerous Arctic bases abandoned after the Cold War and built others; the United States has done likewise, modernizing its radar installation at Thule in Greenland, reoccupying an airfield at Keflavík in Iceland, and establishing bases in northern Norway.

Increased economic and military competition in the Arctic has significant nuclear implications, as numerous weapons are deployed there and geography lends it a key role in many nuclear scenarios. Most of Russia’s missile-carrying submarines are based near Murmansk, on the Barents Sea (an offshoot of the Arctic Ocean), and many of its nuclear-armed bombers are also at bases in the region to take advantage of the short polar route to North America. As a counterweight, the Pentagon has deployed additional subs and antisubmarine aircraft near the Barents Sea and interceptor aircraft in Alaska, followed by further measures by Moscow. “I do not want to stoke any fears here,” Russian President Vladimir Putin declared in June 2017, “but experts are aware that US nuclear submarines remain on duty in northern Norway…. We must protect [Russia’s] shore accordingly.”

#### The plan solves utility emissions---that's sufficient to stop extinction

Murray 18 [Michael, President of Mission:Data, has over fifteen years of experience with building automation, energy management, metering and public utility regulation. “IS IT TIME TO ENFORCE ANTI-TRUST LAWS AGAINST UTILITIES?”. 10/18/18. http://www.missiondata.io/news/2018/10/18/is-it-time-to-enforce-anti-trust-laws-against-utilities]

Since the electric utility industry’s inception over a century ago, utilities have acted in -- or meddled with, depending upon your point of view -- markets adjacent to the traditional power business. APS, in Arizona, sold energy-hogging washing machines and dryers in retail locations as late as the 1970s in order to increase demand for power. The founder of Commonwealth Edison, Samuel Insull, who was once Thomas Edison’s personal secretary, realized that peak demand occurred in the evening due to “illumination,” and so he built and purchased streetcar lines, sold electric irons and stimulated demand from various appliances usable during the daytime in order to improve power plant utilization around the clock. Even the Tennessee Valley Authority, a federal agency, offered substantial rebates for appliances in order to induce demand for electrons.

Despite all the talk of “natural monopoly,” electric utilities have played well outside the poles-and-wires sandbox for decades. Even today, utilities are in the news for building their own electric vehicle charging infrastructure. Some would say these actions, which are outside of the state statutory mandate to provide “safe and reliable” electric service, are sometimes thought to be sensible, or even desirable, evolutions of a maturing industry. But anti-trust enforcement is an often-ignored tool in the toolbox that deserves reexamination for at least three reasons.

First, the pace of climate change is frightening enough that scientists and world leaders are calling for unprecedented, dramatic shifts in American energy systems in the next twelve years. There is a significant possibility that electric utilities aren’t up to the task -- at least on the timescale needed. Looking at the railroads or telecommunication industries throughout history, regulated monopolies have rarely, if ever, adapted to new conditions in any timeframe that scientists now consider reasonable. (We could refer to electric utilities’ pace of change as “glacial,” but the irony is that the world’s glaciers are melting much faster than anticipated.) Can large, bureaucratic utilities compress their clockspeeds in order to rapidly decarbonize? It seems much more likely that the marketplace of distributed energy resources (DERs) could provide precisely the velocity that utilities lack. Connecting DERs to the grid as quickly as possible can likely only be accomplished by harnessing market forces.

Second, electric utilities have long used token gestures toward clean energy or “consumer empowerment” to neutralize opponents in ways that are anti-competitive. For example, one utility argued to us that third party data access was unnecessary because the utility offered its own website and mobile app. The utility has a state-granted monopoly over power distribution, yet where in statute did the state grant the utility a monopoly on websites and smartphone apps that use customer energy data? Similarly, utilities with energy efficiency (EE) programs have long argued that the existence of such programs make wholesale business model changes unnecessary. Gradualism, it is argued, is sufficient, and saving 0.5% to 1.0% of energy demand per year with EE programs is good enough. Unfortunately, however, utilities can stifle competition in the process. Why enable a truly competitive market for EE when you can control it entirely? In the wake of Cambridge Analytica, many see Facebook’s actions to increase user privacy as merely a ploy to delay sweeping new legislation from Congress. DER proponents should similarly view utilities’ token gestures for what they are -- small concessions that prolong the utilities’ dominance at the expense of cheaper, cleaner and more reliable distributed resources from a competitive market.

Third, new energy around anti-trust enforcement has recently entered the national political scene. America’s 40-year low in company formation coupled with the reaction to Facebook’s Cambridge Analytica scandal (which we wrote about before) have caused members of Congress to ask not only whether individuals’ data are adequately protected, but whether market concentration in the hands of a few players is in part responsible for the vulnerability in the first place. As recently as this week, twelve state Attorneys General wrote to the Federal Trade Commission expressing concern over data monopolies’ effects on competition:

“[T]here is concern that the immense advantages certain firms have in consumers’ data...may effectively block new entry or expansion, thereby limiting choice and, in some cases, harming competition.

“Firms that have obtained a disproportionate advantage in one line of business may find it easy to abuse that advantage by applying it to other lines of business in order to keep out competitors – who may be equally or more efficient but for the data advantage carried over from the first market. This could be of concern with new lines of business, and perhaps particularly in the context of new services. For example, firms with an asymmetric advantage in data might be able to identify competitive rivals at a very early stage, and perhaps eliminate competition…”

As data monopolies such as Facebook come under increasing scrutiny by politicians, we can harness the national attention on this topic to ask: Are electric and gas utilities data monopolies, too?

In our recent report, we highlighted the “demarcation point” in telecommunications. This is the point where the public telephone system ends and the customer’s in-home wiring begins. The FCC’s 1968 Carterfone decision defined this electrical interface and limited the telco’s role and responsibility to their side of the fence, thereby allowing market innovations on the customer’s side of the system such as wireless telephony, voice mail and modems. Without the Carterfone decision, we might still be using landline telephones manufactured by AT&T. Ma Bell would sue you for connecting another manufacturer’s telephone to their network.

Similarly, electric utilities will tend to exert their power over anything that touches the electricity system, whether that serves the public interest or not. Anti-trust enforcement by the Federal Trade Commission, Department of Justice and state Attorneys General is worthy of consideration to meet our pro-competition, pro-consumer and pro-environment goals. The DER community could use a fascinating 1976 Supreme Court Case, Cantor v. Detroit Edison Co., as a model: A retailer of lightbulbs sued the utility, Detroit Edison, for using its monopoly power to unfairly restrain the sale of lightbulbs in violation of the Sherman Anti-Trust Act. The Supreme Court agreed that state regulation does not exempt the utility from certain anti-trust laws.

There are limits to the utility’s monopoly. As a strategy for the DER community, settling with utilities for another decade of uninventive EE programs in which utilities pick winners and control the market is not going to meet our objectives. It’s time to look at anti-trust law to enforce limitations on utilities and mandate utility-to-DER interoperability standards. After all, restrictions on “behind-the-meter” activities of utilities are not only necessary to protect competition, but they may be necessary to save the planet.

#### Otherwise utilities turn rate changes into artificial barriers against new DERs entrants

Wara 17 [Michael, Associate Professor and Justin M. Roach, Jr. Faculty Scholar, Stanford Law School. “COMPETITION AT THE GRID EDGE: INNOVATION AND ANTITRUST LAW IN THE ELECTRICITY SECTOR”. 10/25/17. https://www.nyuelj.org/wp-content/uploads/2016/09/Wara\_ready\_for\_printing\_v2.pdf]

Following the release of Disruptive Challenges, utilities around the country, but especially in key solar markets, have responded in two significant ways to the challenge presented by distributed solar energy. First, they have sought to change rate structures to eliminate the incentives their customers may have to adopt the new technology, thereby suppressing the trigger of the death spiral.20 Second, and to a lesser extent, they have entered into direct competition with the companies that seek to provide distributed solar to electricity consumers, thereby positioning themselves to succeed in the new market environment to which the industry is transitioning.

Electric utilities have shareholders whose interests they are legally obligated to protect. And utilities appear to be acting to head off the nascent threat to a business model that has served them well for more than a century. Depending on one’s perspective, and on the details, these regulatory changes amount to either a more accurate allocation of grid costs or the erection of barriers to prevent entry of new, innovative competition. Utilities may be protecting their non-solar customers from the burden of subsidizing those who install solar, or they may be working to ensure that competition with their entrenched monopolies never occurs. Telling the difference has become a key unaddressed policy and legal question for public utility commissions.

Traditionally, utilities have billed their customers with rate structures based on energy sales. A customer’s bill was a function of their total energy consumption, measured in kilowatt hours (kWh) over a billing period, usually a month. In the face of new competition, utilities and their regulators are rapidly reassessing this energy sales-based rate structure and moving to a more complex structure, sometimes for all customers, but more often only for those customers that choose to install distributed energy resources. The new rate structures involve either a large fixed charge, independent of usage; a demand charge, which is set based upon a customer’s maximum rate of consumption during the billing period; or both, in addition to a charge for energy consumption. These rate structures are not novel—they have long been common for large customers such as large commercial or industrial customers, but they have never before been applied to the residential customers whose installation of solar PV poses a competitive threat to utilities.

Normally, when firms with market power move to quash competition, antitrust liability under the Sherman Act, or at least the risk of it, is created. However, because investor owned electric utilities are state-chartered monopolies, they are generally exempt from federal regulation of their anticompetitive conduct. But this exemption from antitrust liability is not unlimited. Moreover, the contours of the exemption are relatively unclear given current U.S. Supreme Court jurisprudence, especially in the face of a radical change in the technological structure of the industry. Thus, moves by utilities to prevent entry or forestall competition create at least a risk of antitrust liability, even if approved by their PUCs.

The division of regulatory authority between the federal and state governments under the Federal Power Act allocates oversight of wholesale electricity sales to the Federal Energy Regulatory Commission and oversight of retail electricity sales to state PUCs. Because the technological and economic challenge to utilities is coming from the retail customers of utilities rather than from, for example, large power plants that wish to sell power across the utilities’ transmission systems, state regulators will make the key decisions governing the competition between solar energy providers and regulated utilities. The Federal Power Act leaves to states the authority to regulate retail and intrastate energy transactions.22 The heart of this jurisdiction is the authority of state public utility commissions to regulate the rates that utilities charge their retail customers for power sales. Thus, public utility commissions are in the position of having to manage a difficult transition from a highly stable monopoly structure to a much more dynamic and competitive one, although one in which grid-supplied electric energy will remain central for many years to come.

Attempts to ensure market competition, or to avoid the social costs that occur when markets are not sufficiently competitive, require taking account of industries’ technological and economic structure. Traditionally, in the United States, competition has been policed in structurally competitive markets using antitrust law.23 However, in markets that are best characterized as natural monopolies, a grant of monopoly power has often been provided to a single firm that is then subject to an obligation to serve all customers and to price regulation via cost-of-service ratemaking.24 While both systems are far from perfect,25 many legal and economic scholars have argued that in their appropriate contexts— a structurally competitive market or a natural monopoly—these approaches fill a similar need.26 The most challenging context in which to apply either, however, is when industries undergo transition, often because of technological change, between a stable, naturally monopolistic structure, and unstable, structurally competitive one.2

In this Article, I detail the utility industry response to the call to action in Disruptive Challenges. I present evidence for the widespread existence of potentially anticompetitive actions by utilities from a survey of rate cases. My survey shows that, from 2013 to 2015, utilities in at least 19 states sought to restructure rates to reduce competition from distributed energy resources. Some utilities are also going into direct competition with solar providers. I explore the legal implications of this response by today’s utility industry to current and anticipated competition from distributed solar generation. I examine the ambiguities that exist in the current doctrine on utility antitrust immunity. I then suggest approaches for public utility commissions that may serve to reduce the anticompetitive aspects of new rate structures and so reduce the risk of antitrust liability for electric utilities as they respond to emerging competition from distributed energy resources. Finally, I argue that in managing responses to competition by electric utilities, public utility commissions must exercise oversight of the competitive impacts of rate cases.

#### Non price barriers ALONE stop DERs adoption

Wara 17 [Michael, Associate Professor and Justin M. Roach, Jr. Faculty Scholar, Stanford Law School. “COMPETITION AT THE GRID EDGE: INNOVATION AND ANTITRUST LAW IN THE ELECTRICITY SECTOR”. 10/25/17. https://www.nyuelj.org/wp-content/uploads/2016/09/Wara\_ready\_for\_printing\_v2.pdf]

Of course, this cannot be the whole story. Regulated utilities recognize the competitive threat, exercise market power, and are likely to respond in anticompetitive ways if permitted to do so. One would expect that regulated utilities, seeking to protect their shareholders’ value, would act to modify rates in ways that would forestall or eliminate new competitive entrants. Rates are just one method of creating barriers to entry for new technologies that may reduce returns for grid-supplied energy.

Other methods include rules that explicitly limit or forbid such competition or rules that erect non-price barriers to entry such as complicated, expensive, or time-consuming processes governing connection of DERs.43 The evidence suggests that utilities can, and to some degree are, engaging in a number of non-price-related practices that would normally raise competition concerns. Utility permission is required to interconnect distributed energy resources with the grid.44 Getting interconnection permission often results in varying time delays.45 Furthermore, it can result in substantial and unpredictable costs because utilities can require mitigation for new distributed energy resources in the form of distribution system investments.46 Utilities also have important informational advantages regarding where on the grid distributed energy may be most valuable.47

Nevertheless, given that most utilities have to routinely submit rate cases to their commissions, attempts to modify rates to forestall or eliminate competition are to be expected given the business incentives facing the utilities. The traditional job of the commission in this context is to evaluate these rates and to protect ratepayers—presumably balancing the interests of customers both with and without DERs against the expectation of utilities for a fair return on their investment. Generally speaking, protecting the interests of other firms that might compete with the utility, or considering the impacts of a rate on innovation, are not part of the process.

#### DERs are a renewable accelerant and solve warming

Roberts 21 [David, Clean Energy Expert with 15 Years of Experience, CE Writer @ Vox, Previously Writer @ Grist. “Rooftop solar and home batteries make a clean grid vastly more affordable”. 5/28/21. https://www.volts.wtf/p/rooftop-solar-and-home-batteries]

Energy nerds love arguing over the value of distributed energy resources (DERs), the rooftop solar panels and customer-owned batteries that are growing more popular by the day. There’s a fight in California right now over the value of energy from rooftop solar, just the latest skirmish in a long war that has ranged over numerous states.

The conventional wisdom in wonk circles is that the value provided by DERs is not sufficient to overcome the fact that the energy they produce is, on a per-kWh basis, much more expensive than that produced by utility-scale solar, wind, and batteries (residential solar is roughly 2.5 times as expensive as utility-scale solar, according to NREL).

For that reason, many wonks view DERs as a kind of boutique energy and argue that public funds are better spent on utility-scale energy.

Turns out: no, that’s wrong. Some groundbreaking new modeling demonstrates that the value of DERs to the overall electricity system is far greater than has typically been appreciated.

The work didn’t get the attention it deserved when it came out in late December, so I want to spend some time with it. First, though, let’s get clear on what we’re talking about.

The misguided battle between centralized and distributed energy

To understand the difference between centralized and distributed energy, it’s important to understand the distinction between transmission grids, the high-voltage power lines that carry electricity over longer distances, and distribution grids, the nests of low-voltage power lines (strung from the familiar brown poles) that carry electricity to local consumers. If the transmission grid is the interstate highway system of electricity, distribution grids are the local road systems that branch off those main trunks.

Centralized energy generally refers to utility-scale power generators (or energy storage) hooked up directly to the transmission grid: coal or natural gas plants, wind farms, solar fields, grid-scale battery stacks, what have you. The big stuff.

Distributed energy consists of anything that generates, stores, or manages electricity on distribution grids: rooftop solar panels, ground-mounted “community solar” arrays, consumer batteries, electric vehicles, building energy management software, and the like. (And then there’s truly distributed energy, in the form of off-grid installations that don’t connect to any larger grid. We won’t be getting into that today.)

Some distributed solar covering a parking lot. (Photo: Getty Images)

Some distributed solar covering a parking lot. (Photo: Getty Images)

To paint in broad and somewhat crude strokes, advocates for centralized renewable energy tend to view advocates for distributed energy as crunchy pastoral proto-hippies who can’t handle modernity. They note that utility-scale energy is cheaper and capable of powering highly energy-dense modern economies, whereas distributed energy is expensive and diffuse.

Advocates for distributed energy tend to view advocates for centralized energy as corporate capitalists in thrall to perpetual growth. They note that distributed energy brings a range of benefits, from resilience and independence to savings on avoided infrastructure, whereas utility-scale energy tends to do greater damage to landscapes and concentrate economic power.

Like many disputes in the energy world, this one has hardened into an identity battle, which is annoying and unproductive, since the answer, like with so many other disputes, is both-and.

Nonetheless, it’s worth noting that advocates for distributed energy have been at something of a disadvantage to date. It can be devilishly difficult to quantify the benefits of DERs, so a lot of the discussion gets into hand-wavey intangibles.

It can be especially difficult to quantify the benefits of DERs to larger grid systems, because energy modeling to date has effectively ignored distribution grids (which represent about a third of US spending on electricity). It has treated them purely as load, as demand to be satisfied, rather than as active, flexible participants in grid management.

Until now!

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Or, until a few months ago anyway. In December, energy modeler Christopher Clack (a familiar name to Volts readers) and his team at Vibrant Clean Energy (VCE) debuted a new way to model the energy system that takes into account DERs and the services they provide. They used it to study the effect of DERs on the electricity system and the results are summarized in “A New Roadmap for the Lowest Cost Grid.” (Full technical report here; slideshow presentation here.)

Spoiler: the cheapest possible carbon-free US grid involves vastly more centralized renewable energy, but it also involves vastly more distributed energy. What’s more, far from being alternatives, they are complements: the more DERs you put in place, the more centralized renewables you can put on the system. DERs are a utility-scale renewable accelerant.

The practical implication is that going all out on DERs is to everyone’s benefit, up and down the electricity supply chain, from utilities to consumers.

It is difficult to exaggerate just what a revolutionary change this represents in energy modeling and how much it turns conventional wisdom on its head. By making distribution grids visible to their model and co-optimizing those grids with the transmission system, the team at VCE uncovered a source of grid flexibility that could save a decarbonizing electricity system some half a trillion dollars through 2050. That’s real money.

(If you want to take a deep dive into the material, check out this interview with Clack on Chris Nelder’s Energy Transition Show. It is gleefully nerdy; I cannot recommend it highly enough.)

The cheapest energy scenario is clean and distributed

At the heart of VCE’s work is Clack’s state-of-the-art modeling tool: Weather-Informed energy Systems: for design, operations and markets planning (WIS:dom). It allows resolution down to two-mile square areas and makes dispatch decisions every five minutes. It takes into account granular weather data stretching over decades, climate impacts, policy, all forms of generation, storage, transmission, and on and on. VCE boasts that it “leverages 10,000 times more data points than traditional models.”

For this study, WIS:dom was augmented to better understand and represent distribution grids, so that it could bring transmission and distribution systems together in one system and co-optimize them. It was given better information about the costs and capabilities of DERs and more options; for example, instead of spinning up a new generator to meet peak demand, it could draw on distributed solar and batteries.

The transmission/distribution interface. (VCE)

The transmission/distribution interface. (VCE)

No one to Clack’s knowledge has done this before, so there was a lot of experimenting to get it right. “I had to spend a lot of money and time and resources upgrading the model to include this, with a lot of failures along the way,” says Clack. “That's why I'm confident that we did it first, because I spent a lot of time trying to find someone else that had done it, so I didn’t have to do the hard work.”

The modeling question was: if a high-resolution optimization tool is given DERs as an option, will it choose to deploy them? If so, how much?

The broader social question was: can DERs help lower the overall costs of a clean electricity system? If so, by how much?

The paper presents four core scenarios (which were run across a range of geographies):

BAU (business as usual), which includes existing policies and mandates but otherwise lets economics drive dispatch decisions; it deploys WIS:dom in a way that mimics traditional models;

BAU-DER, which does the same but uses the augmented form of WIS:dom, with greater visibility into distribution systems;

CE (clean energy), which models a system that reduces power sector carbon emissions 95 percent from 1990 levels by 2050; WIS:dom mimics traditional models;

CE-DER, which models a 95 percent reduction but uses the augmented form of WIS:dom.

To skip straight to the results: if you make DERs an option for the model, it deploys an absolute boatload of them (spending about $10 billion extra over the first 10 years), and by doing so substantially reduces overall system costs.

(VCE)

(VCE)

BAU-DER is $301 billion cheaper than BAU (the blue line above), which means we would save money from day one by deploying more DERs even if we didn’t care about climate change.

CE-DER is $473 billion cheaper than CE (the green line), which means DERs will make the decarbonization of electricity much less expensive than doing it all with centralized renewables and storage.

And here’s the kicker: CE-DER is $88 billion cheaper than BAU (the red line), which means, economically speaking, we’d be better off reducing electricity emissions by 95 percent using DERs than continuing with the status quo.

(And this is all just the pure economics — it leaves out the enormous health savings and environmental justice benefits of reduced point-source pollution.)

Whether you’re concerned about climate change or not, whether you want to reduce emissions or not, whether you care about the health and resilience of local communities or not, deploying DERs brings down system costs. It’s the fiscally responsible thing to do.

Now, note the shape of the red line above (and to a lesser extent, the green line). Scenarios that decarbonize using DERs are a smidgen more expensive for the first 10 years or so because they use those early years to deploy an enormous quantity of DERs.

The US currently has about 98 gigawatts of rooftop solar and less than a gigawatt of distributed energy storage installed. Through 2025, CE-DER deploys an additional 75 gigawatts of distributed solar and 27 gigawatts of distributed storage; by 2035, it is 200 and 90, respectively. (By 2050, it is 247 and 160.)

That is an absolute DER building binge, starting now.

(VCE)

(VCE)

After that early period of heightened investment, though, savings begin to skyrocket as DERs pay off in system benefits.

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DERs make everything else on the grid work better

For the entire history of electricity up until about five minutes ago, grid operators viewed electricity demand as an exogenous variable, a set figure they had to meet with supply, not something they had much control over.

The key to the value of DERs is that they make electricity demand more controllable. With energy generation and storage scattered throughout distribution grids, grid operators have a way to move energy around, both geographically and temporally, without firing up more power plants. They can absorb extra energy if there’s a dip in demand or produce extra energy if there’s a spike. The overall effect is to smooth out the “demand curve.”

Look at the thick black line on the top right graph below — that’s the distribution demand curve throughout a representative year:

Look at the demand curve on the top right and then on the bottom right: flatter! (VCE)

Look at the demand curve on the top right and then on the bottom right: flatter! (VCE)

Now note the same black line on the bottom right graph. By satisfying the little demand peaks with distributed solar and storage, the demand for utility-scale energy is leveled off.

Here’s a graph that shows a “load duration curve,” which reveals how high demand is, for how often in the year, and how DERs affect it:

(VCE)

(VCE)

As you can see by the sharp spike on the left, there are relatively rare periods of extremely high demand (peaks). The problem is that the current electricity system has to be sized to meet those peaks, even if that means many power plants end up idle most of the time. Clack says that today, roughly 20 to 25 percent of generation capacity on the grid — some 300-350 gigawatts — covers around 3 percent of the energy load each year. (This, in a nutshell, is why electricity systems everywhere are so overbuilt.)

The light blue-shaded area on the curve shows the reduction in demand that DERs can provide (the dark blue on the right is the increase in demand). Not only can DERs “shave the peak” by an average of 17 percent nationwide, they can reduce the demand for utility-scale energy for 80 percent of the hours of the year. They make the load duration curve more level as well.

These demand-leveling effects bring four big benefits:

First, if you don’t have those big peaks in demand for utility-scale energy, then you don’t need that 20 to 25 percent of capacity that only runs during peaks. Not building those plants, or shutting them down early, saves lots of money.

Second, a more level demand curve means that all generators on the system will run more consistently, with fewer ramps up and down, at closer to their full capacity, helping to maximize their value.

Third, a more level demand curve means that transmission congestion will be reduced and transmission assets will be more efficiently utilized. (In one of my Transmission Month posts, I discussed “energy storage as a transmission asset.” This is the same idea, on a broader scale.)

Fourth, DERs offer the system the option to shift demand to meet variable supply, rather than always forcing it to shift supply to meet demand. Shifting demand is often much cheaper.

These benefits explain why CE-DER is so much cheaper than CE, and even than BAU. They explain why, even though rooftop solar may cost more than centralized solar on a per-kWh basis, its value is greater.

Infusing distribution systems with DERs allows grid operators more stability and more options — including more renewables.

DERs enable more utility-scale renewables

Wind and solar are cheap, but they are variable. They come and go on their own schedule, outside of our control. There will be times — seconds, minutes, hours, sometimes weeks and months — when wind and solar dip and something else is needed to fill the gaps.

Conventionally, this role is played by dispatchable generators that can be turned up and down at will — these days, mostly natural gas plants. Given that most natural gas plants, at least those without carbon capture, will have to be phased out in a decarbonized system, there’s a hunt on for “firm” zero-carbon alternatives — think nuclear, hydro, natural gas or biomass with carbon capture, or geothermal.

But VCE’s modeling shows that a big chunk of that role can be played by DERs, which Clack calls a “firming agent on the load.”

By bringing demand more under grid operators’ control, DERs virtually eliminate curtailment, or discarding of renewable energy due to temporary oversupply, through 2045. Just as they allow transmission to be used more effectively, they allow us to consume more of the energy generated by existing utility-scale renewables.

They also prevent the familiar problem of “value deflation” — more wind and solar energy at particular times and places competes with existing wind and solar energy from the same times and places — by giving grid operators a whole series of time- and location-specific demand knobs that they can turn up or down at will to better accommodate renewables.

By preventing value deflation, DERs will allow for more new renewables on the system (and the retirement of more thermal and fossil generation). That’s why the CE-DER scenario builds more utility-scale wind and solar than the CE scenario. CE-DER builds 800 gigawatts of utility wind, 800 of utility solar, and 200 of utility storage, whereas CE builds 60 gigawatts less wind and 50 less solar (though slightly more batteries).

By enabling renewable energy to be moved around, DERs unlock more of it — with, again, enormous public health benefits that are not captured in the model.

Put technically, as Clack told Nelder, “the model says that distributed [solar] and storage in some combination ends up being higher value than the differential in the [levelized] cost of utility-scale solar and distributed solar.”

Put more colloquially, though it will require enormous upfront investment in the coming decade, laying a quilt of DERs over the nation’s distribution systems is the best thing we can possibly do to enable the rapid emission reductions we will need in the decade after.

DERs are not a boutique version of, or a distraction from, utility-scale renewables; they are a necessary complement, an enabler and accelerator.

(VCE)

(VCE)

DERs will mean more jobs

VCE did some analysis estimating that the DER-enhanced scenarios would add an additional million jobs per year relative to conventional scenarios.

It stands to reason that a huge deployment of DERs would create lots of jobs. These are very hands-on, labor-intensive projects. And since distribution systems are ubiquitous in the US, it would create jobs in every part of the country (though not uniformly).

I’m generally suspicious of employment projections, so I don’t know how much stake to put in the particular figure, but we can be confident that more DERs = more jobs.

DERs could hasten the collapse of existing power markets

VCE’s modeling shows that current electricity markets, if they are not reformed, basically collapse in the next 10 to 20 years. DERs will hasten that collapse in two ways.

First, they will reduce demand peaks, which produce a great deal of value in current markets. Lots of peaker plants will get cancelled or shut down and peaker money will dry up.

Second, DERs will enable more utility-scale wind and solar, which have zero marginal costs. They are all upfront capital costs; once a solar panel is in place, it doesn’t cost it anything more to produce the next kW. It can bid into markets at $0. Pretty soon, so much of the market’s power will come from zero-marginal-cost sources that prices will be $0 most of the year, and $0 means zero profit for participating generators.

Electricity markets were built for fossil fuel generators. They need reform — but that’s a topic for a different post. (This is a good start.)

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Clean electrification boosts the value of DERs

An intriguing note: Clack says that if WIS:dom is told not just to decarbonize electricity but to decarbonize the whole economy (i.e., electrify everything), the value of DERs to the grid effectively doubles.

An economy-wide decarbonization scenario that makes use of DERs saves a trillion dollars relative to one that doesn’t. VCE will have a new report on economy-wide decarbonization coming out soon.

DERs also provide a range of co-benefits

VCE’s modeling only captures DERs’ contribution to overall grid performance and cost. It does not capture many of the benefits that have long attracted customers to them: resilience against brownouts and blackouts, the capacity to go off-grid temporarily (or permanently), independence from the whims of utilities and state regulators, reduced personal greenhouse gas emissions, and most of all, lower electricity bills.

All of those benefits will help drive early adoption of DERs as their value to the grid ramps up (though they should be boosted by utility, state, and federal incentives).

The value of DERs should be visible in all models and states

Clack says that it’s just four paragraphs of code that open WIS:dom up to distribution grids — other models, including the models that utilities use in planning, could easily replicate this.

“One of the reasons I was so keen on having it be relatively simplistic is, it should be able to be adopted by other models,” he says. “Maybe they wouldn't show as much savings as we do, because of different model logic, but I'm pretty confident they will show similar trajectories.”

Today, we have released our full technical report on the "Why Local Solar and Storage Costs Less". Two weeks ago, we released the main findings: savings of $473 billion when co-optimizing distribution. This released provides more details!

Image

December 14th 2020

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This is just one more area where outdated utility models and practices are keeping costs too high and the clean-energy transition too slow. Utilities have traditionally been hostile to DERs, viewing them as competitors or net costs, but VCE’s modeling demonstrates what should have been obvious: having flexible generation and storage infused throughout distribution grids offers a fantastic tool to help stabilize a grid with growing renewables and increasing electric loads and bring costs down for all ratepayers.

#### Integration in the US is modeled globally.

Shen 21 [Bo Shen, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, Fredrich Kahrl, 3rdRail Inc., and Andrew J. Satchwell, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, "Facilitating Power Grid Decarbonization with Distributed Energy Resources: Lessons from the United States", Annual Review of Environment and Resources, vol. 46, no. 1, 7/2/21, https://www.annualreviews.org/doi/pdf/10.1146/annurev-environ-111320-071618]

Globally, renewable energy is already playing a significant and growing role in electricity systems. The world's renewable energy power generation capacity more than doubled from 1,223 GW in 2010 to 2,532 GW in 2019 (9). Wind and solar account for most of the recent growth in renewable generation. The installed capacity of wind energy increased from 181 GW in 2010 to 622 GW in 2019 while the installed solar photovoltaic capacity increased significantly from 40 GW in 2010 to 579 GW in 2019 (9).

The United States is among the world's fastest-growing countries in terms of both renewable installed capacity and power generation (10). Renewable electricity generation in the United States doubled from 2008 to 2018, with wind and solar generation accounting for the majority of growth (11). As a result of rapid growth, the share of nonhydro renewable generation rose from 3% of US electricity generation in 2008 to 10% in 2018 (11, 12). The share of renewable generation is expected to continue to grow in order to meet state-level renewable energy targets and state and federal climate goals.

Approximately half of the growth in renewable energy deployment in the United States can be attributed to state-level renewable energy targets (13). As of 2019, 13 states as well as Washington, DC, and Puerto Rico had either enacted legislation or issued executive orders with a commitment to achieving either 100% renewable energy or 100% clean energy goals (14).1 Figure 1 shows state-level renewable energy targets adopted across the United States by the end of 2019.

[FIGURE 1 OMITTED]

Despite ambitious renewable energy targets, major obstacles must be overcome to enable future energy systems to economically and reliably operate with high penetration of variable renewable energy (VRE). As the US Department of Energy points out, “[o]ne of the greatest challenges to integrating VRE lies in managing its effects (variability, uncertainty, location specificity, nonsynchronous generation, and low capacity factor) on grid operations and planning” (15, p. 61). With the large-scale deployment of wind and solar generation on both the grid side and customer side, transmission system operators and distribution utilities face new operational challenges. Distributed energy resources (DERs) are emerging as a potential solution alongside traditional generation, transmission, and distribution infrastructure for addressing these challenges.

As the US Federal Energy Regulatory Commission (FERC) points out, there is no uniform definition of DERs, and the definition keeps changing (16). The US National Association of Regulatory Utility Commissioners (17, p. 45) broadly defines DERs to reflect their diversity:

A DER is a resource sited close to customers that can provide all or some of their immediate electric and power needs and can also be used by the system to either reduce demand (such as energy efficiency) or provide supply to satisfy the energy, capacity, or ancillary service needs of the distribution grid. The resources, if providing electricity or thermal energy, are small in scale, connected to the distribution system, and close to load. Examples of different types of DER include solar photovoltaic (PV), wind, combined heat and power (CHP), energy storage, demand response (DR), electric vehicles (EVs), microgrids, and energy efficiency (EE).

DERs have seen rapid growth in the United States. Distributed PV installations grew from 0.4 GW in 2010 to 10.5 GW in 2017 (18). According to data from the US Energy Information Administration (19, 20), the total existing small-scale storage power capacity connected to the US distribution network increased from 66 MW in 2016 to 234 MW in 2018. Among the capacity in 2018, 97% were behind-the-meter installations, and the share in the commercial, residential, and industrial sectors were slightly higher than 50%, 31%, and 15%, respectively. Demand response (DR), which is a program aimed at adjusting electricity demand “in response to price, monetary incentives, or utility directives so as to maintain reliable electric service or avoid high electricity prices (21, p. i),” has been active in the United States over the past five years. Between 2015 and 2019, the number of customers enrolled in DR programs increased from 9 million in 2015 to almost 11 million in 2019. At the same time, the actual peak demand savings averaged 12.2 GW per year, and the average annual power savings was 1357.4 GWh (22). Advanced metering infrastructure (AMI) is the foundation for the expansion of distributed energy systems. AMI is “an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers” (23, p. 4). The number of advanced meters increased from 58.5 million in 2014 to 86.8 million in 2018. Its penetration rate (the proportion of advanced meters in the total number of meters deployed in the United States) jumped from 38.8% to 56.4% in the same period (24).

The role of DERs as an electricity system resource has evolved over time. Historically, most DERs in the United States were demand-side management programs funded and administrated by utilities with the goals of cost-effectively reducing demand and enhancing utilities’ interactions with their customers. These traditional programs focused primarily on energy efficiency and interruptible load management programs oriented around peak reliability needs.

Advanced DER applications go beyond traditional power system reliability needs to serve customers’ growing interests in new, customer-sited applications such as distributed generation (DG), energy storage, load response, and managing electric vehicles while helping address emerging power system challenges. These challenges include the need to balance a large amount of solar and wind energy output that is neither constant nor fully predictable and the need to more actively operate distribution systems that have growing penetrations of customer-sited resources. Through bidirectional power flow, advanced system control, and real-time information flow, DERs are well suited to provide flexible resources to enable dynamic load adjustments to real-time operational conditions, thus improving the stability of the grid and enhancing grid flexibility for integrating VRE (25).

DERs offer numerous services and provide value to three different power system perspectives—regional system operators, utilities, and customers (see Table 1). Many of these services are critical for operating a stable and flexible electricity system powered by VRE (26). In addition to the benefit of grid flexibility, DERs could also play an increasingly critical role in improving power system resilience to deal with significant disruptions resulting from severe weather, deadly wildfires, and other extreme events (27).

[TABLE 1 OMITTED]

This article examines US regulatory policy and implementation experience in deploying DERs to offer insights for the design of energy and climate policies and the potential role and challenges of DERs in decarbonization and improved power system resilience, in both the United States and other countries. The remainder of the article is organized as follows. Section 2 presents the framework through which this article reviews the US experience and lessons learned in adopting enabling policies and creating effective markets and business models for DER. Section 3 focuses on the role of specific federal and state policy measures in the United States in driving DER deployment. Section 4 discusses various market strategies and business models adopted in the United States in facilitating DER expansion. Section 5 describes major challenges and lessons learned thus far that may inform possible solutions in both the United States and elsewhere. Section 6 concludes the article with insights for other countries.

#### Only antitrust solves—provides vital private deterrence and regs fail

Vaheesan 19 [Sandeep Vaheesan is legal director at the Open Markets Institute. Vaheesan previously served as a regulations counsel at the Consumer Financial Protection Bureau, where he helped develop and draft the first comprehensive federal rule on payday, vehicle title, and high-cost installment loans. Paula Bliss, of counsel, Bernheim Kelley Battista & Bliss, MARK A. GOTTLIEB Counsel of Record PUBLIC HEALTH ADVOCACY INSTITUTE, PNE Energy Supply LLC, On Behalf Of Themselves And Others Similarly Situated V. Eversource Energy And Avangrid, Inc. Motion Of Open Markets Institute For Leave To File Amicus Curiae Brief In Support Of Plaintiff-Appellant. 10/25/19, https://static1.squarespace.com/static/5e449c8c3ef68d752f3e70dc/t/5eaa1d9d2790182e187cc171/1588207017816/19-1678\_Documents-as-filed.pdf]

Since Congress and FERC have committed to market-based pricing in wellhead gas, resales of gas, and wholesale electricity, the full application of the antitrust laws is critical for ensuring the success of this legislative and regulatory market creation. Even as FERC maintains oversight of the electricity and natural gas markets, this regulatory supervision has important limitations and cannot be expected to root out all anticompetitive conduct. Antitrust enforcement complements FERC oversight and provides vital deterrence against anticompetitive practices in gas and electricity markets. Specifically, antitrust suits brought by injured consumers and businesses provide strong deterrence of anticompetitive conduct as well as compensation. In dismissing the plaintiff-appellant’s suit, the district court severely weakened the effectiveness of the antitrust laws and empowered sellers of gas and electricity to profit through anticompetitive market conduct. FERC oversight is not adequate to prevent anticompetitive conduct and ensure that markets in natural gas and electricity are free from collusive, exclusionary, and other unfair market conduct. Although FERC has an obligation to maintain “just and reasonable rates” under the Natural Gas and Federal Power Acts, 15 U.S.C. § 717c, it has only very limited tools to police specific anticompetitive conduct in the gas and electricity markets and to provide any remedy for anticompetitive market conduct it discovers after the fact.

Even assuming FERC acts against anticompetitive and other unfair conduct, 5 its remedies provide inadequate deterrence and cannot be counted on to compensate injured parties. FERC can impose monetary penalties of up to a fixed maximum amount per day on parties over whom it has jurisdiction and who have violated FERC rules in gas or electricity markets. 15 U.S.C. 717t-1; 16 U.S.C. 825o-1(b). All such penalties, however, go to the United States Treasury, not to the injured customers, absent agreement by the defendant. FERC can also order disgorgement of ill-gotten profits as a result of market manipulation. Revised Policy Statement on Enforcement, 123 FERC ¶ 61,156 (2008). Both remedies are, at best, an imperfect approximation of market-wide injury to purchasers and, at worst, a small fraction of market harm and woefully inadequate to deter market misconduct. And they offer no guarantee of full compensation for injured parties.

Given FERC’s limited market oversight powers, antitrust enforcement plays an important role in gas and electricity markets. Antitrust lawsuits help identify and stop anticompetitive practices and ensure that market-based pricing serves the public. When sellers engage in collusion, exclusion and mergers, they can enhance and maintain their market power and profit at the expense of purchasers and rivals. See, e.g., Keyspan, 763 F.Supp. at 636 (describing alleged effects of anticompetitive swap agreement involving rival generators in New York City). As federal regulators have renounced or been deprived by Congress of direct price setting authorities, the full effectiveness of the antitrust laws is essential. Jim Rossi, Lowering the Filed Tariff Shield: Judicial Enforcement for a Deregulatory Era, 56 Vand. L. Rev. 1591, 1648 (2003). See also Alfred E. Kahn, Deregulatory Schizophrenia, 75 Calif. L. Rev. 1059, 1059 (1987) (“While prepared to defend enthusiastically the deregulations with which I have been involved, I feel equally strongly that they have greatly accentuated the importance of antitrust enforcement.”).

The filed rate doctrine’s limitation on private antitrust enforcement subverts the effectiveness of the antitrust laws. The ability of injured consumers and businesses to bring antitrust suits is a pillar of the American antitrust enforcement regime. Under the Clayton Act, “[a]ny person who shall be injured in his business or property by reason of anything forbidden in the antitrust laws may sue . . ., and shall recover threefold the damages by him sustained, and the cost of suit, including a reasonable attorney's fee.” 15 U.S.C. § 15. See, e.g., Blue Shield of Va. v. McCready, 457 U.S. 465, 472 (1982) (quoting Mandeville Island Farms, Inc. v. Am. Crystal Sugar Co., 334 U.S. 219, 236 (1948)) (“Congress sought to create a private enforcement mechanism that would deter violators and deprive them of the fruits of their illegal actions, and would provide ample compensation to the victims of antitrust violations. . . . As we have recognized, ‘[t]he statute does not confine its protection to consumers, or to purchasers, or to competitors, or to sellers. . . . The Act is comprehensive in its terms and coverage, protecting all who are made victims of the forbidden practices by whomever they may be perpetrated.’”).

Empirical research shows the public importance of “private attorneys general” and the value of having more enforcers on the beat against corporate collusion, consolidation, and monopolization. A study of 60 private antitrust lawsuits between 1990 and 2011 found that these actions generated more deterrence than the federal government’s entire criminal antitrust enforcement activity over the same period. Joshua P. Davis & Robert H. Lande, Defying Conventional Wisdom: The Case for Private Antitrust Enforcement, 48 Ga. L. Rev 1, 26 (2013). And these lawsuits compensated injured parties, whereas public enforcement generally did not.

#### Extinction level warming is reversible

Bendix 21 [Aria Bendix , Senior Reporter at Insider, covering science and health citing IPCC Aug 2021 Climate Report. Aylin Woodward , and Morgan McFall-Johnsen. “Climate scientists want you to know it's not too late”. 8/10/21. https://www.businessinsider.com/still-time-to-address-climate-change-ipcc-scientists-report-2021-8]

At first glance, Monday's long-awaited report from the Intergovernmental Panel on Climate Change was bleak. It found that some consequences of human-driven emissions are irreversible for centuries to millennia, and that warming will continue to some extent over the next two to three decades, regardless of how much emissions drop.

But the assessment also emphasizes that the worst-case climate disasters aren't inevitable: Every half-degree of warming that can be averted makes a huge difference — including in the intensity and frequency of extreme heat, rainfall, and drought. Even incremental reductions in emissions today would stave off more catastrophic events in the coming decades.

The IPCC report comes from a working group of hundreds of scientists whose last assessment was in 2013. This new report shows that human-caused emissions have led the planet to warm by 1.1 degrees Celsius in the last 170 years. Some glacial melting and sea-level rise will continue for millennia, no matter what happens next.

But Youba Sokona, vice-chair of the IPCC, highlighted a more optimistic takeaway: "We are in the right moment to completely change the direction we are taking," he told Insider.

In the IPCC's worst-case scenario, global emissions would double by 2050, causing temperatures to rise an average of 2.4 degrees Celsius between 2041 and 2060. But in the best-case scenario, the global temperature would rise just 1.5 degrees between now and 2040, then dip back down by the end of the century.

That means there's still time to act.

"It is virtually certain that global surface temperature rise and associated changes can be limited through rapid and substantial reductions in global greenhouse-gas emissions," the IPCC authors wrote.

The world has some time to lower emissions

paris climate agreement

A woman walks past a map at the World Climate Change Conference 2015 (COP21) at Le Bourget, near Paris, France, on December 11, 2015. Reuters/Stephane Mahe

In the Paris agreement, world leaders pledged to cut greenhouse-gas emissions enough to keep global temperatures from rising more than 1.5 degrees Celsius above pre-industrial levels. Now, Earth's temperature is very likely to blow past that mark in the next 20 years, according to the IPCC report.

But the Paris agreement's larger goal was to avoid a 2-degree rise at all costs. That's still possible, scientists say.

"It's very likely that we'll exceed 1.5 degrees," Greg Flato, a climate scientist from the Canadian Center for Climate Modeling and one of the new report's co-authors, told Insider. "It's possible to exceed slightly and stabilize if we follow a pathway of deep emissions cuts by midcentury."

Already, the world cut carbon emissions by 2.5 billion tons in 2020, since pandemic-related lockdowns meant fewer vehicles on the road, planes in the sky, and less collective electricity use at peak times. That's a roughly 6% decline from the year prior, following decades of rising global emissions.

"The lesson we can learn from that is that we can change our behavior drastically in the short term," Sokona said.

The IPCC found that every trillion tons of carbon emitted leads the world's temperature to rise roughly 0.45 degrees. To stay under the 2-degree threshold, we have about 900 billion tons of carbon left in the budget. In 2019, emissions reached about 37 billion tons — so if that rate continues and no carbon gets removed from the atmosphere, we'd have about 25 years remaining.

There's still time to mitigate extreme heatwaves, drought, and floods

Drought Brazil

A Brazilian worker surveys the cracked ground of Jaguary dam in Braganca Paulista on January 31, 2014. Nacho Doce/Reuters

A difference of half a degree may sound minor, but avoiding that increase would make the difference between extreme and deadly heatwaves, droughts, and floods and milder, less frequent versions of these events.

At 2 degrees of warming, extreme temperature changes could be twice as pronounced as they would be at 1.5 degrees, the IPCC report found. Globally, the chance of at least three months of drought per year would rise from about 20% at a 1.5-degree temperature rise to 35% at 2 degrees.

The Atlantic Meridional Overturning Circulation (AMOC), meanwhile, could lose nearly 30% of its pre-industrial strength if global temperatures rise anywhere between 1.5 and 2 degrees Celsius. This system of ocean currents moves warm water from the equatorial tropics up to Europe and the north Atlantic. The influx of warmer water contributes to western Europe's mild, temperate climate, so if the current gets weaker, it could result in more intense winters in some places and more frequent heatwaves and droughts in others.

Higher temperatures will also shrink the planet's ice sheets, snow cover, glaciers, and permafrost — a layer of soil that used to stay frozen year-round. As permafrost thaws, it releases carbon, which traps heat and contributes to additional warming. With each degree of warming, the top 3 meters of permafrost could lose 20-30% of its volume, the IPCC found.

Even if humanity doesn't wind up avoiding all of these disasters, the report at least tells policymakers what's in store.

"Having that information today allows us to begin the actions that will make us ready a decade from now, mid-century, and at the end of the century," Alex Ruane, one of the report's lead authors, told Insider.

"This provides a kind of roadmap, or at least a forewarning, of the types of changes that we have to be prepared for," Ruane said, adding, "This is where my optimism lies."

#### Utilities target integration of energy storage—that undermines crucial storage investments

Welton 21 [Shelley Welton, Assistant Professor, University of South Carolina School of Law, "Rethinking Grid Governance for the Climate Change Era", California Law Review, 109(1), February 2021, HeinOnline]Shelley Welton, Assistant Professor, University of South Carolina School of Law, "Rethinking Grid Governance for the Climate Change Era", California Law Review, 109(1), February 2021, HeinOnline]

On the whole, RTOs are inveterate stallers when it comes to integrating new resources that would improve their markets but threaten incumbents' bottom line. This is not a minor flaw: RTO heel-dragging causes years, if not decades, of delay in critical market improvements, costing billions of dollars and causing significant greenhouse gas emissions. 205 It is perverse that our key grid operators-ostensibly created to improve competition and efficiency-should have to be forced, through years-long processes, to make design improvements that benefit consumers and the environment.

RTOs' dilatory tactics have manifested in several technically dense controversies, which I outline here only in broad strokes. (Indeed, likely one of the reasons that RTOs get away with these delays is that these topics are so complicated that they confound efforts at media attention or civic engagement.) The first such controversy is over what is known as demand response. Currently, most customers pay a per-kilowatt-hour fee for electricity that does not shift over the course of the day, week, month, or year-such that their demand fluctuates mostly in response to the weather and their daily schedules. 206 This causes major spikes in demand during peak hot and cold periods, and supply must be adequate to cover these spikes.207 To alleviate the costs of building supply that operates only at peak periods-and to help integrate more renewables onto the grid economists have long called for making electricity demand more responsive to changes in supply.208 However, demand response is less popular among transmission and generation owners. Because demand response reduces the amount of infrastructure that needs to be built, and serves as a balancing resource for renewable resources that may be competing with traditional fossil fuel resources, these entities see it as a threat to their revenue streams. 209

Although FERC has eschewed any specific role as an environmental regulator, it has embraced demand response as a means of ensuring "just and reasonable rates." 210 RTOs, though, have on the whole been far less enthusiastic about integrating demand response. To force RTOs' hand, FERC in 2008 required RTOs to amend their market rules to "accept bids from demand response resources, on a basis comparable to any other resources .. . ."211 The Commission surely hoped that was a job complete. But many RTOs continued to disadvantage demand response resources by paying less for reductions in megawatts demanded than was paid to suppliers for providing megawatts.212 To remedy this deficiency, just three years later FERC had to promulgate another rule that required RTOs to compensate demand response "at the market price for energy." 2 13 Power generators challenged this order in court and the Supreme Court ultimately upheld it.214

Still, in a tale not unlike the one plaguing women in American workplaces, 215 demand response's "equal pay for equal work" fight within RTOs is not over. Additional complex barriers remain across regions.2 16 At the same time, new demand-side technologies have emerged that require their own concerted battles to overcome RTO resistance. In particular, attention has focused in the last several years on energy storage. Energy storage is often called the "holy grail" of clean energy efforts because of its ability to balance out renewable energy supply by storing it during periods of abundance, and releasing it during periods of under-supply. 217

Given these myriad benefits, FERC has been particularly interested in better integrating storage into energy markets. Certain RTO members, however, have considerably less interest because storage lessens the need for natural gas. The natural gas industry argues that it has an important role in a high-renewables grid, because as a fast-ramping, dispatchable resource, it balances out the intermittency of renewables.2 18 But storage can play this same role, emissions free-not to mention that it can also reduce and replace transmission and distribution infrastructure. 219 If the storage industry can capitalize upon these many value streams, it will become a significant threat to incumbent resources.22 o

For these reasons, FERC again has had to force RTOs into action. 22' In 2018, FERC ordered RTOs to create a "participation model" for storage to remedy unreasonable market barriers that regions have erected. 222 But many RTO responses to the order have been underwhelming, with recent compliance filings clinging to discriminatory practices. 223 For example, PJM's filing contained a requirement that storage must be able to run for a minimum of ten hours to qualify as a Capacity Storage Resource-a requirement the Energy Storage Association called unnecessary and discriminatory. FERC has since initiated a paper hearing to determine whether this requirement is warranted. 224

None too pleased with these developments, industry incumbents also took to the courts to stave off storage as a competitor, although with limited success: in July 2020, the D.C. Circuit quickly dispensed with a challenge brought by several RTO member utilities and their trade groups that contested FERC's jurisdiction to force the participation of storage resources in wholesale markets. 225

More recently, FERC has acted to integrate distributed energy resources (DER) into markets. DER is a technical term for small-scale generation devices like rooftop solar panels. 226 DER can play a similar role to storage in balancing energy supply and demand and improving the reliability and efficiency of the grid, especially when aggregated into larger units that can participate in RTO markets. 227 DER's potential in this regard led FERC, in 2020, to issue Order

2222, which requires RTOs to revise their tariffs to allow "distributed energy resource aggregations" to participate fully in RTO markets. 228 FERC had to foist this reform upon certain of its RTOs, which insisted that in spite of DER's significant growth in the last decade and projected "explosive growth" in the next several years, 229 "DER programing must not be done in haste." 230 Again, then, we see at least some RTOs hesitant to independently advance resources that could cut emissions and lower prices by reducing the need to build generation, transmission, and distribution infrastructure. Whether these regions will respond to FERC's order with robust reforms remains to be seen, but past practice leaves room for doubt.23

The final example of RTO heel-dragging that bears mention is transmission policy. As discussed in Part IILA, building more large-scale transmission will be key to integrating a large amount of renewable energy into the system. 232 To be fair, RTOs do not bear most of the blame for the challenges plaguing transmission planning and construction-states, utilities, FERC, certain environmental groups, Congress, and the courts play major roles. 233 But RTOs have exacerbated the problem by continuing to erect barriers to non-incumbent transmission companies competing to build new transmission lines.234 Moreover, as I have catalogued elsewhere, they have resisted creating planning processes that weigh "non-transmission alternatives" fairly. 235

These examples make clear the extent to which RTOs are obfuscating when they claim not to be policy-makers. Clearly, the market rules established by RTO governance processes have profound impacts on which resources power the U.S. electricity grid. Indeed, as FERC has explained, the reason that markets have discriminated against demand response, storage, and DER is that barriers "can emerge when the rules governing participation in those markets are designed for traditional resources and in effect limit the services that emerging technologies can provide." 236 Note the passive voice: the barriers just "emerged." Such passive problem-creation is the predictable result of a memberdriven process for raising and vetting issues, where incumbents have both reason and power to block the entry of new competitor technologies.

#### Only new storage innovation makes DEWs possible – it’s the biggest barrier

Ward 18 [Robert Hunter, U.S. Air Force officer and recent graduate of the United States Air Force Academy. “The Dawn of Anti-Personnel Directed-Energy Weapons”. 7/24/18. https://thestrategybridge.org/the-bridge/2018/7/24/the-dawn-of-anti-personnel-directed-energy-weapons

In order to foster an innovative culture and arrive at anti-personnel aerial lasers, development of directed-energy weapon technologies as defensive systems to incinerate incoming missiles—a sustaining innovation—should continue. As hypersonic missiles become more of a possibility, lasers capable of destroying a target at the speed of light might be the only method of defense against such weapons. In November 2017, for example, U.S. Air Force Air Mobility Command expressed interest in testing the capabilities of lasers mounted on a KC-135 refueling tanker for self-defense.[10] In June 2017, Raytheon bolted a laser on an U.S. Army AH-64 Apache Helicopter and successfully destroyed an aerial target in a test environment. At sea, destroyers and cruisers are being equipped with lasers to defend themselves against drones and missiles.[11] As for ground-based systems, the U.S. military is placing lasers on short range air-defense vehicles as well.[12] This effort has already seen much progress since 1983, when President Ronald Reagan charged innovators with a heavy task by asking, “[What if] we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies?”[13] The biggest barrier to further development has been power storage; hence there will need to be a continued focus on developing batteries and compact power generation devices.[14]

#### DERs drive battery innovation—spills over between different applications

Farmer 21 [Matthew Farmer, staff writer covering global energy generation, storage, and resource affairs, Power Technology, "Is this the golden age of battery innovation?", 4/12/21, https://www.power-technology.com/features/is-this-the-golden-age-of-battery-innovation/]

“Given that the requirements for stationary storage are set to become more diverse and more demanding as the share of variable renewable electricity rises, we expect innovation in batteries will need to rise further, in parallel with innovations in non-battery stationary electricity storage, especially for longer duration storage.”

Innovations in any one of these can benefit all markets. As an example, patenting activity in the manufacturing and engineering of battery cells has grown to three times its size in the past decade. In 2018, half of all battery-related IPFs concerned manufacturing and engineering.

The EPO/IEA report points to downward price trends as proof of synergy between different applications. It continues: “For example, the Tesla Roadster, the first highway legal serial production all-electric car to use lithium-ion battery cells, was launched in 2008.

#### Specifically key to DEW innovation

Daniels 17 [Jeff, reporter for CNBC.com. “Laser weapons developers ‘riding the wave’ created by Tesla, other battery innovators“. 11/17/17. https://www.cnbc.com/2017/11/17/laser-weapons-riding-the-wave-created-by-tesla-battery-innovators.html]

Advances made in automotive battery technology by Tesla and others are now being borrowed to help the Pentagon get high-power laser weapons that can kill everything from enemy drones to missiles.

The work on laser weapons underway includes an Air Force Research Laboratory contract awarded to Lockheed Martin last week to develop high-power fiber lasers that will be tested on a tactical fighter jet by 2021. The fighter jet demonstration project is part of the Air Force lab’s so-called SHiELD or Self-protect High Energy Laser Demonstrator program.

“You can power the laser like you can power the car off a battery system,” said Rob Afzal, senior fellow of laser weapon systems at Lockheed, the nation’s largest defense company. “We would use the same type of battery technology ... and the reason is you need to be able to deliver a lot of energy in a short period of time.”

Indeed, efficient lithium-ion battery technology commonly found in electric cars is now getting leveraged to drive power generation and storage solutions for military laser applications. It allows lasers to achieve significant bursts of energy very quickly for incinerating enemy targets, just as a Tesla Model S driver could accelerate from 0 to 60 miles per hour in a matter of a few seconds.

“As the batteries get smaller, cheaper, have more power density, more reliable, we’re just going to just have better power systems for the laser,” said Afzal. “The battery technology is ahead of the laser weapon technology.”

Some experts credit Tesla for helping bring a revolution in electric cars and lithium-ion battery technology, while also driving down battery costs and expanding the power storage market beyond cars. Even so, the Tesla brand competes with other lithium-ion battery suppliers, and research firm Technavio last year predicted the Chinese would surpass the U.S. in research and development spending on laser systems by 2022.

“It’s funny how a lot of things that happened in the auto industry can filter over into new capabilities on most other technologies, and lasers is one of them,” said Air Force lab’s SHiELD’s program manager Richard Bagnell.

Dan Goure, a former Pentagon official and now senior vice president of Virginia think-tank Lexington Institute, said the Lockheed contract to develop a laser for a fighter jet shows how far the research has come in terms of making laser weapons smaller.

In a release, Lockheed said this month its team will be “focused on developing a compact, high efficiency laser within challenging size, weight and power constraints.” It also said the laser system would be “pod mounted on the tactical fighter jet.”

‘Elon Musk in camouflage’

Yet the challenge comes from the fact that directed-energy weapons — lasers — tend to draw significantly more power than an automotive battery would require. The airborne laser weapons are designed to store power to fire off dozens of shots but can also include a power recharge system much like a hybrid electric car.

“You may literally not have to be generating power per se on the airplane [for laser weapons],” said Goure. “You can have battery storage, kind of like Elon Musk in camouflage.”

It’s unclear if Musk’s Tesla or its suppliers are providing battery storage systems to the defense contractors for laser weapons. Tesla declined comment for this story.

For its part, Lockheed says it doesn’t use its own specialized battery technology for the lasers but one that’s being developed for automobiles, aircraft and other applications.

‘Riding the wave’

“We’re riding the wave,” said Afzal. “The battery advances are remarkable. We’re going to utilize that.”

Regardless, the military has been researching lethal lasers since the 1960s but in the past decade development has intensified with the focus on technologies that have more power, accuracy and reliability.

#### Extinction if the US loses the DEWs race—happens before escalation

Del Monte 21 [Louis A. Del Monte, CEO of Del Monte and Associates and has more than thirty years of experience in physics, technology, and engineering, was a leader in the development of microelectronics and sensors for IBM and Honeywell for over 30 years, “The Game of Cat and Mouse,” War at the Speed of Light: Directed-Energy Weapons and the Future of Twenty-First-Century Warfare, U of Nebraska Press, 03/2021, pp. 13–64 ]

We are living in a period that historians term the Long Peace. By this, they mean that since the end of World War II, there has not been a full-scale war between great powers. We should count that as one of our blessings; however, it has also induced a kind of amnesia, Following World War II, most people throughout the world had vivid memories of the horrific destruction wreaked by nuclear weapons. During the Cold War between the United States and the Soviet Union, those memories remained foremost in people’s psyche. Then a strange, unexpected event unfolded: the USSR collapsed. From that point, the United States defined the world order, and people throughout the world began to forget.

To some extent, they may have willfully erased the dreadful consequences of a full-scale thermonuclear war. Russia, however, still has a formidable nuclear weapons capability. China, whose economy is second only to that of the United States, is rapidly investing in its military and has its own impressive nuclear weapons capability. Unfortunately, as of January 23, 2020, taking all these developments into consideration, the Bulletin of the Atomic Scientists has decided to set its “doomsday clock” to “100 seconds to midnight,” the closest to catastrophe it has been since 1953. A

This symbolic setting of the doomsday clock suggests that the use of nuclear weapons is more likely now than at any time since the Cold War. To my mind, the most likely reason for the erosion of the global security situation is due to mass amnesia regarding the horrific devastation of nuclear weapons. The National Interest, an American international affairs magazine, observed, “The worst mistake to make about nuclear weapons is to believe that they are ordinary arms, available for military use like any other.'-

The torch of national leadership is now in the hands of a generation whose only understanding of the horrendous use of nuclear weapons during World War II is from history books. Given the tensions between the United States and China regarding the latter’s disputed claims over the China Sea and Taiwan, as well as issues with North Korea, Iran, and Russia, the possibility of a conflict is increasing. Unfortunately, such a conflict could go nuclear, intentionally or unintentionally, and the world appears complacent about the horrors of a potential nuclear war. Some in the media even suggest we could win a nuclear war. For example, here is a 2018 headline from the Hill, an American political newspaper and website: "Only Trump Can Restore America's Ability to Win a Nuclear War."1 This apparent widespread ignorance regarding nuclear conflict is forcing me to ask, Is nuclear war winnable?

Is a Nuclear War Winnable?

It has been well over seventy-five years since the United States dropped nuclear weapons on the Japanese cities of Hiroshima and Nagasaki during World War II. Although they were small nuclear weapons by today's standards, their combined death toll reached over 2 5 0,000 people, most of whom were civilians.4

The bombs dropped on Hiroshima and Nagasaki were atomic bombs, meaning they derived their destructive force from nuclear fission. As noted in chapter 1, nuclear fission results when an atom splits into two or more fragments, releasing its binding energy. A nuclear explosion occurs when a significant amount of fissionable material is present, and the fission of one generation of nuclei produces particles that cause the fission of at least an equal number of nuclei of successive generations. In the parlance of nuclear physics, this is a chain reaction, where atoms split, releasing subatomic particles that split more atoms until the process consumes the fissionable material. Because a nuclear weapon typically has pounds of fissionable material, an enormous number of atoms split and enable the chain reaction to release a massive amount of energy, including ionizing radiation, such as neutrons, gamma rays, alpha particles, and electrons moving at speeds close to the speed of light. This released radiation explains why many people who were not directly killed by the atomic bomb’s blast later died from radiation poisoning.

The U.S. military describes the destructive force of nuclear weapons in terms of tons of TNT. For example, the U.S. military describes the Little Boy atomic bomb dropped on Hiroshima on August 6, 1945, as equivalent to about fifteen kilotons (fifteen thousand tons) of TNT, and the Fat Man atomic bomb dropped on Nagasaki on August 9, 1945, as equivalent to about twenty kilotons of TNT. However, this convention of expressing the energy released in terms of TNT does not change one important fact: a nuclear explosion accomplishes its devastation via the release of energy, which is typically measured in joules. One ton of TNT is a unit of energy equal to 4.184 gigajoules.5 (A gigajoule is equal to a billion joules. An easy way to think about it is that a watt is the flow of one joule per second of energy. Your ordinary household 100- watt light bulb emits 100 joules per second.) For completeness, we can express the release of the Little Boy as follows: 15 tons x 4.184 gigajoules = 62.76 gigajoules, or 17,433,333.3 watt­ hours. Similarly, Fat Man equals 83.68 gigajoules, or 23,244,444.4 watt-hours. I believe the U.S. military uses the "ton of TNT” convention because it is easier to grasp. However, as the military moves to directed-energy weapons, which are able to replicate the destructive power of nuclear weapons, I expect it will describe their destructive capabilities in terms of energy. If I am right, the word “joules” will become common in the military vernacular.

At present, not only has the number of nuclear-armed nations expanded—to nine—but nuclear weapons technology has also evolved. Instead of fission nuclear weapons, we now have thermonuclear weapons, often called hydrogen bombs. In a hydrogen bomb, fission is only the beginning of the process. The initial energy from the fission process ignites a fusion reaction between the hydrogen isotopes deuterium and tritium, which fuse to form helium and release energy. With sufficient quantities of deuterium and tritium, a chain reaction results in releasing an enormous amount of energy that is thousands of times more potent than the first atom bombs used in World War II. Instead of talking in kilotons of TNT, the world militaries describe these bombs in megatons (i.e., millions of tons) of TNT. For example, the B83—the U.S. military’s current gravity bomb (a free-falling bomb dropped from a plane) —is a thermonuclear weapon with an adjustable yield, or destructive power, ranging from the low kilotons up to a maximum of 1.2 megatons.- To put this in perspective, in Hiroshima and Nagasaki, each bomb dropped was less than twenty-one kilotons of TNT and destroyed almost everything within a one-mile radius from the center of the explosion.2 The total death toll, as previously noted, exceeded 250,000 thousand people, which amounted to about half of the population of Hiroshima and Nagasaki.- If the United States had dropped 1-megaton bombs on Hiroshima and Nagasaki, the blast radius of each bomb would have been over three miles, and the death toll would have been over half a million people, encompassing the entire population of each city in 1945.^

As of this writing, there are nearly 14,000 nuclear weapons in the world. The United States has 6,550, and Russia, 6,800. The remainder by country in ascending order is found in North Korea (10-20), Israel (80), India (120-130), Pakistan (130-140), United Kingdom (215), China (270), and France (300),ie These numbers are approximations since each country holds its exact number as a tightly held secret. With these figures in mind, let’s address two questions that explore the limits of nuclear war.

What Would Happen If the United States and Russia Engaged in a Full-Scale Nuclear War?

According to an Office of Technology study for the U.S. Congress in 1979, in the event of a nuclear war, 70 million to 160 million people (35-80 percent of the population) would immediately die in the United States.— Russian fatalities would be approximately 20-40 percent lower. Many more in both countries would die from injuries, cancer-related deaths, and psychological trauma. In updating these numbers to reflect the populations as of 2018 and the urbanization of the United States, the death toll is certainly higher. In 19 79 the United States had a population of about 225 million; in 2018 it was 327 million, with much of the growth occurring in urban areas, where approximately 80 percent of the U.S. population now lives.— By contrast, Russia’s population has only grown modestly, from a population of about 13 7 million in 1979 to 144 million in 2018.11

On the surface, even with the increased urbanization of the United States, the report’s numbers appear to suggest that even the combatant nations could survive a full-scale nuclear exchange. However, that is not the case. In addition to the immediate deaths and the total destruction of cities by nuclear blasts, more casualties would occur from the potential aftermath of a nuclear war: firestorms, widespread radiation sickness from the bombs and radioactive fallout, the loss of modern technology due to electromagnetic pulses, and a nuclear winter resulting in worldwide famine.

Deaths from the nuclear blast, firestorms, and radiation are relatively easy to grasp. Deaths from the effects of an EMP blackout and a nuclear winter are more challenging to understand. Therefore, let us discuss each.

EMP Blackout: A nuclear detonation causes an electromagnetic pulse, which produces rapidly varying electric and magnetic fields. In turn, those fields cause electrical and electronic systems to experience damaging current and voltage surges, resulting in a blackout. (Note: In physics, a current generates a magnetic field, and a rapid change in a magnetic field generates a surge current.) How severe would an EMP blackout be? EMP expert Peter Vincent Pry concludes in a 2017 report that in a widespread EMP attack, "nine of 10 Americans” would die "from starvation, disease, and societal collapse."14

Reading that last line is chilling. Even if portions of the country are not affected by the nuclear blast, radiation, and firestorms, the United States of America would cease to exist if the effects of EMPS caused the deaths of 90 percent of its residents. According to Pry, Russia views EMP differently—as a "revolution in military affairs,"15

Nuclear Winter: If you are fortunate enough to survive the nuclear blast, radiation, fallout, and EMP blackout, you are still likely to perish in the coming years. Alan Robock and Owen Brian Toon, in their paper, “Self-assured Destruction: The Climate Impacts of Nuclear War,” hypothesize that a thermonuclear war could result in a nuclear winter that would be the end of all modern civilization on Earth.15 The nuclear winter would result from the smoke and soot arising from burning wood, plastics, and petroleum fuels in nuclear-devastated cities and blocking the sun's rays. A recent study reports the resulting darkness would cool the core farming regions of the United States, Europe, Russia, and China by about 54-68 degrees Fahrenheit.12 The cooling effect would reduce crop yields and, due to disrupted agricultural production and distribution, lead to a “nuclear famine” characterized by mass starvation.15 The simple takeaway is modern civilization on Earth would cease to exist, and the remnants of humanity would find themselves struggling to survive.

Conclusion: There would be no winners in a full-scale nuclear exchange between the United States and Russia.

What Would Happen If Two Nations Engaged in a Limited, Regional Nuclear War?

At first, you might assume that a limited, regional nuclear war is winnable. On the surface, it would appear to be a reasonable assumption given over five hundred atmospheric nuclear explosions (including eight underwater) with a total yield of 545 megatons have been conducted since 1945 and did not lead to a nuclear winter. You may wonder why.

As previously discussed, a nuclear winter is the result of smoke (i.e., black carbon) in the stratosphere blocking the sun. With nuclear testing, we did not experience a nuclear winter because nations conducted the aboveground tests in areas where there was not much to burn. For example, the United States carried out nuclear testing in the Nevada desert and did not generate any significant amount of smoke because the area lacked the combustible materials found in urban areas.

In a limited, regional nuclear war, adversaries likely would target each other’s military assets and command-and-control operations, both of which could be near or within cities. Indeed, adversaries may target large population areas as a tactic to demoralize the populace. Now let us address the question of whether this limited, nuclear exchange would lead to a nuclear winter.

A 2014 paper by Michael J. Mills and colleagues studied the global impacts of a regional nuclear war,12 Their model assumed a limited, regional nuclear war between India and Pakistan in which each side detonated fifty fifteen-kiloton nuclear weapons, producing about five teragrams (5 million metric tons) of black carbon. In addition, they assumed the black carbon would self-loft to the stratosphere, where it would spread globally. What impact would this have on the earth? Their calculations "show that global ozone losses of 20%-50% over populated areas, levels unprecedented in human history, would accompany the coldest average surface temperatures in the last 1000 years. ... Killing frosts would reduce growing seasons by 10-40 days per year for 5 years. Surface temperatures would be reduced for more than 25 years due to thermal inertia and albedo effects in the ocean and expanded sea ice. The combined cooling and enhanced uv [ultraviolet] would put significant pressures on global food supplies and could trigger a global nuclear famine.”22

Conclusion: Even a limited, regional nuclear war could result in a nuclear winter and worldwide famine, which would threaten humanity’s survival.

After examining these two questions, which represent the extremes of nuclear war, we can conclude that no nuclear war is winnable. There has been significant research in this area, and we have covered the key findings. It is reasonable to believe the nations with nuclear weapons understand that using them in any capacity risks global human annihilation. As a result, nuclear powers such as the United States, Russia, China, and others are working to increase the potency of their conventional weapons to further their international agendas. As they do so, however, they are also increasing the pace of warfare.

Increasing the Pace of Warfare

In chapter 1, we discussed six military technologies that have the potential to tilt the balance of terror. One common denominator running through them is their ability to increase the pace of warfare, from hypersonic missiles traveling at five times the speed of sound to laser weapons that travel at the speed of light (three thousand times the speed of sound). Given this insight, it is reasonable to ask, Why are the major military powers, such as the United States, China, and Russia, focused on increasing the pace of warfare? To address this question, let us look at it from two perspectives—strategy and technology.

Strategically, speed in warfare plays a critical role. For example, the U.S. military must be able to respond to rapidly changing situations. Therefore, its decision-making needs to exceed any adversary’s military initiative in three ways:

1. By anticipating an adversary’s potential action and having a plan to counter it

2. By having better mobility than an adversary

3. By providing real-time voice, data, and imagery information via satellite to every level of command, including leaders at the lowest levels in the military hierarchy

These capabilities radically shorten what military strategists call the decision space. If we look at World Wars I and II, the United States had time to marshal its immense strength. For example, it took nearly a year after the bombing of Pearl Harbor on December 7, 1941, for those American troops who arrived in the British Isles in January 1942 to see action against the Axis powers.^- Today’s adversaries and the pace of war no longer afford that time to react to acts of war that happen suddenly and without provocation. According to Gen. Joseph F. Dunford Jr., former chairman of the Joint Chiefs of Staff, "The character of war in the 21st century has changed, and if we fail to keep pace with the speed of war, we will lose the ability to compete.”— Although this example views speed through the eyes of the U.S. military, I believe it applies to our most capable adversaries as well.

Next, let us examine how technology is changing the pace of warfare. World militaries are seeking technological advantages that enable them to deliver debilitating force at speeds that do not allow an adversary to take countermeasures. While on the surface this may seem like a new tactic, it is quite old. For example, Chinese military strategist and philosopher Sun Tzu's The Art of War, which dates to about 500 BCE, has this to say about speed in warfare: "Speed is the essence of war. Take advantage of the enemy’s unpreparedness; travel by unexpected routes and strike him where he has taken no precautions.”21

This strategy played a role in numerous historical battles. For example, we see its implementation during the American Revolutionary War. Schoolchildren typically learn that Gen. George Washington and his revolutionary army crossed the icy Delaware River on the night of December 25, 1776, to launch a surprise attack against the Hessian forces in Trenton, New Jersey. On December 26, 1776, General Washington defeated a garrison of Hessian mercenaries in the Battle of Trenton. Many consider this battle a turning point in the Revolutionary War.

You may argue General Washington used surprise, not speed, to achieve victory. That is a fair point. However, now in the age of satellite surveillance, speed is what enables the element of surprise in war. Any prelude to an attack, such as amassing forces within striking distance of an adversary, is easily detectable via satellite data. Current military thinking is to use speed so that an adversary has no time to prepare for an attack. This thinking thus underpins hypersonic missile development. The United States, China, and Russia have tested hypersonic missiles, and it appears that both China and Russia lead the United States in this technology. Reuters, an international news organization, reported, "Admiral Harry Harris, the former head of U.S. Pacific Command, told the House Armed Services Committee in February last year [2018] that hypersonic weapons were one of a range of advanced technologies where China was beginning to outpace the U.S. military, challenging its dominance in the Asia-Pacific region."24 CNBC, an American business news cable TV channel, also reported, "Putin, who was speaking at a forum in the Black Sea resort of Sochi [in 2018], added that Moscow’s hypersonic weapons program was ahead of its competitors.”—

As a result, the United States is making hypersonic missile development a top priority. Phys.org, a science, research, and technology news aggregator, observed: "The Pentagon has declared hypersonics to be its number one research and development technical priority. The president’s recent budget request proposes allocating almost $3 billion to develop hypersonic weapons and defense systems against potential adversaries’ hypersonic weapons.”—

In addition, the United States is developing laser weapons, which are in their initial deployment by the U.S. Navy.22 Based on Einstein’s theories of relativity, nothing in the universe can travel faster than light; therefore, even a hypersonic missile would appear to be standing still compared to the speed of light projected by an antimissile laser weapon. Although the United States does not openly state a plan to use lasers against hypersonic missiles, I believe this would be among its ultimate goals. For now, though, imagine a scenario where the U.S. military has a mirror orbiting in space. Then imagine that it could use a powerful laser to bounce a beam off that mirror to destroy any target on Earth, in space, or during flight, such as a hypersonic missile. You may think this idea is the stuff of a science fiction movie, but the laser development at Lawrence Livermore National Laboratory may make it a reality (see chapter 4). Conceivably such a weapon could destroy an adversary’s entire military capability in a flash, pun intended. Even a nation’s ability to launch a counterstrike via missiles from submarines might become futile if a laser can destroy them in flight. Conventional antimissile weapons require calculating the trajectory of an incoming missile; the speed of a laser makes this unnecessary. A laser fired at a missile’s radar coordinate would hit it as if suspended in flight. That is one of the critical advantages lasers offer as antimissile defense weapons.

Directed-energy weapons hold the promise of conventional military domination. By most accounts, the United States leads the world in this military technology. This knowledge may be reassuring. On the surface, it appears that with this technology, the United States will achieve conventional weapons dominance. However, history teaches us military secrets are hard to keep. For example, the United States once had the lead in nuclear weapons, using its first weapons on Japan in 1945 to effectively end the Pacific war, but by 1949 the Soviet Union had acquired nuclear weapons technology via espionage. This raises a significant question: Why are military secrets so hard to keep? Let us digress for a moment to address it.

The Difficulty in Keeping Military Secrets

The fundamental reason military secrets are hard to keep is that the development of new weapons requires the work of many people, typically thousands. As Benjamin Franklin wrote in Poor Richard’s Almanack in 1735, "Three may keep a secret if two are dead.” While this may seem extreme, there is more than a kernel of truth in his axiom. To illustrate, here is a simple example from the Federation of American Scientists: "The Manhattan Project to develop the first atomic bomb during World War II was among the most highly classified and tightly secured programs ever undertaken by the U.S. government. Nevertheless, it generated more than 1,500 leak investigations involving unauthorized disclosures of classified Project information.”—

In light of all these leaks, Gen. L. R. Groves Jr., head of the Manhattan Project, told Congress, "I would like to say that the only thing that would preserve security would be to lock everybody up, and when they decided to leave to shoot them and be done with it. That is the only way you could have perfect security."22

General Groves was making a point: it is impossible to have perfect security when thousands of people are working on a classified program. Unfortunately, building advanced military weapons requires many people, including those who work in private industry. For example, I held a secret clearance and worked hand in glove with members of the U.S. military to develop new weapon capabilities, as did hundreds of others who worked under my management. This type of working relationship is not unique. It is typical.

As sophisticated U.S. adversaries steal classified information via cyber warfare, I believe it is impossible to maintain security over any protracted length of time. Thus, what is essential in achieving military superiority is maintaining relative momentum—that is, staying years ahead in deploying weapons against which an adversary has no defense. To my mind, this is where things stand today regarding directed-energy weapons, with the Department of Defense collaborating with industry to lead in developing and deploying them. This union of military and industry is, in the common vernacular, an example of the military-industrial complex.

Inside the Military-Industrial Complex

The first time I heard the phrase “military-industrial complex” was during President Dwight Eisenhower's farewell address to the nation on January 17, 1961. Here is an excerpt: "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist. We must never let the weight of this combination endanger our liberties or democratic processes."32 In essence, President Eisenhower seized the opportunity of his final address to warn the nation of a threat to democracy—namely, an overly powerful, politically motivated military-industrial complex.

The threat may seem elusive and nonspecific, and it raises the questions of what the military-industrial complex is and who is involved. Most may answer it is a network of companies that make military weapons. An obvious example would be Lockheed Martin— along with subcontractors Northrop Grumman, Pratt & Whitney, and BAE Systems—as it manufactures the F-35, the fifth-generation stealth multirole fighter aircraft. Media coverage of the F-35 continues to be enormous, and many in the world community know about it. However, providing a complete list of the companies engaged in making any military weapon is extremely difficult. Many critical military technologies remain unknown to both the media and the public. Let me give you an example from my experience.

In 1980 I was the manager of sensor development and manufacturing for Honeywell. Among the sensors we produced were integrated circuit magnetic sensors, typically about the size of your pinky fingernail. Briefly, this sensor can discern magnetic fields. Applications ranged from detecting when someone pressed a specific key on a keyboard to measuring anomalies in the earth’s magnetic field. In the course of business, we received an order for a uniquely designed magnetic sensor from another Honeywell business unit in Europe. To me, this request was business as usual. We supplied magnetic sensors to numerous Honeywell business units, and nothing about this order appeared unusual. We designed the sensor to the purchase order’s specifications and provided the completed products to our shipping department for shipment. However, a few days later, the shipping department asked me to sign an International Traffic in Arms Regulations (ITAR) form requesting permission from the U.S. government to ship armaments of war. I paused and thought, What armaments of-war?

Nothing about the magnetic sensors resembled a weapon. Being cautious, I sought to understand more about the application of sensors and the ITAR document before signing. After communicating with my Honeywell client in Europe, I discovered that the magnetic sensors were a critical element of an anti-tank mine, a type of land mine designed to destroy enemy tanks. Each vehicle from a truck to a tank distorts the earth’s magnetic field in a specific way, and that is its magnetic signature. The magnetic sensors we provided were able not only to sense a tank but also to determine if its magnetic signature was that of an adversary’s tank. With this capability, the mine would only destroy an adversary’s tank. As the duly authorized Honeywell representative, I signed the ITAR document. As I signed, I realized that from that moment, we were part of the military-industrial complex.

I relate this story to make two points:

1. The military-industrial complex is hard to define and includes companies typically not identified as defense contractors.

2. The military-industrial complex is much larger than the Department of Defense and its budget.

The reasons for these points are subtle. Many products and technologies play dual roles. For example, the microprocessor in your computer can simulate a war game or be a vital component in a weapon of war. Thus, the DOD budget does not reflect the development of such products; it only includes their acquisition costs.

In 2018 the U.S. military budget amounted to roughly 3.2 percent of the economy.11 About a third (1 percent) is for weapons development and deployment, and much of what the U.S. military needs to develop weapons typically rests on the collaboration of academia and industry. Having worked in the defense industry and having bid on defense contracts, I can attest that bidding on a typical defense contract requires having a credible capability in place that is applicable to the contract. In simple terms, at Honeywell we built on the technology we already had and were not starting from scratch. Otherwise, our ability to execute the contract would have been questionable, and our bid would not have been competitive. Thus, the one- third of the U.S. military budget for weapons acquisition does not reflect the investments companies make to position themselves to bid on DOD contracts.

The bottom line is that the military-industrial complex is much larger than the acquisitions reflected in the 1 percent of the U.S. defense budget associated with weapons procurement. Industry and academic institutions privately fund much of the fundamental technology regarding weapons development.

Why is this important? It demonstrates that the economy of a country matters for two strategic reasons:

1. Only a country with a strong economy will have the industrial and academic institutions with the necessary discretionary funding to finance the essential technology that will position them to participate in weapons procurement.

2. Only a country with a strong economy can sustain a large defense budget as it procures the latest weapons. Recall that the Soviet Union collapsed in late 1991 after participating in a costly arms race with the United States.

Our most capable potential adversary, China, can have a defense budget that matches that of the U.S. military. While on the surface, the U.S. government significantly appears to outspend China on defense, a complete analysis reveals that is not the case. In 2017, for example, China spent about the same on defense as the United States. I recognize that, in the words of Carl Sagan, ‘‘extraordinary claims require extraordinary evidence." Thus, appendix A of this volume adjusts the defense budget of China and the United States for purchasing power parity—a measure of how much a particular currency will buy in the respective regional market relative to another currency—and labor costs. The results in appendix A yield a stark new reality: the defense-spending strategy of potential adversaries plays a more significant role than it has historically and especially in the new arms race, which includes the race for directed-energy weapons.

The Race for Directed-Energy Weapons

A new revolution is coming in warfare, and, if you will pardon the pun, it is coming at the speed of light. This revolution concerns the emergence of directed-energy weapons, which promise to be even more potent than nuclear weapons. If you are skeptical about this statement, let me relate a scenario involving a laser as a weapon to provide insight into the potency of directed-energy weapons.

Imagine a land-based laser capable of generating the power equivalence of a nuclear weapon. Now imagine bouncing the laser’s beam off a satellite's mirror and reflecting the beam to hit a target anywhere on Earth. What would its effect be on the target? The target would become plasma, the fourth state of matter, a jumble of excited nuclei, atoms stripped of their electrons. All life and structures within the diameter of the laser beam would be destroyed. Next, imagine the target is the city of Beijing. In an instant, 21.5 million people would die. In another fraction of a second, the laser could attack another target; in a minute, it could destroy China. I only used Beijing and China as an example. The same scenario would hold for New York City and the United States, or for any city and any country.

If you are incredulous, let me give you some facts. Numerous countries around the world are making powerful lasers for military purposes, and their ultimate goal is to make them as powerful as a nuclear weapon. Although we have a long way to go, the United States is actively building the world's largest continuous laser at the National Ignition Facility (NIF) of the Lawrence Livermore National Laboratory (LLNL).22 The LLNL website states, “NIF enables scientists to create extreme states of m atter [using a laser], including temperatures of 100 million degrees and pressures that exceed 100 billion times Earth’s atmosphere, NIF supports national security, fundamental science, energy security, and national competitiveness missions.”—

In simple terms, the NIF laser duplicates the phenomena that occur in a nuclear weapon, but to date, it is only able to generate a tiny fraction of the energy output of the smallest nuclear weapon.— The facility's long-term goal is to create a fusion reaction that produces a greater energy output than the laser's input. The implication is this capability would serve as a power generation plant, essentially making all other types of power generation obsolete. Although the Lawrence Livermore National Laboratory’s National Ignition Facility does not discuss the laser’s weapon applications, its national security mission suggests it is actively pursuing weapon applications for this laser. Based on this information, plans for the preceding scenario I provided may be in development. As mentioned earlier, I also believe the LLNL laser may serve as an antimissile weapon, especially since the United States is scrambling to develop defense systems against its potential adversaries' hypersonic weapons.—

One aspect of a laser weapon is that, similar to the Star Trek phasers, it can be “dialed in”; in other words, its power is adjustable from low to high. On low, it might dazzle an enemy combatant, causing temporary blindness or minimal damage to an enemy drone, for example. The damage may be sufficient to cause the drone to malfunction, allowing its recovery for examination. On high, it might kill the enemy combatant; similarly, it might destroy a drone, fighter jet, or missile. The laser weapon deployed by the U.S. military has this dial-in capability.—

Why Nations Are Pursuing Directed-Energy Weapons

Since the U.S. and other militaries already have weapons that can duplicate the destruction of lasers and other directed-energy weapons, you may wonder why world militaries are pursuing directed-energy weapons. Here are the fundamental reasons that drive this pursuit:

They are conventional weapons, regardless of their devastation capability, and thus are not covered by treaties that apply to nuclear weapons.

Unlike a nuclear weapon, no radiation is released during their use.

Unlike most military weapons, directed-energy weapons are silent, and the beams they project are invisible, providing a stealth attribute.

Directed-energy weapons, such as lasers, have a nearly flat trajectory and are unaffected by windage. However, they can be affected by atmospheric conditions (see chapter 4).

In space, directed-energy weapons would be unaffected by Earth’s atmosphere, which makes them ideal for space warfare.

They are cost-effective. A laser beam, for example, can take out a drone for about a dollar a shot.

The technology for directed-energy weapons is rapidly advancing, as is evident when examining the laser deployed by the U.S. Navy. It is relatively small and looks as though it came out of a Star Trek movie (see figure 1).

Ultimately, directed-energy weapons can be a game changer. Conceivably, by 2030, they will be capable of destroying ballistic missiles, hypersonic cruise missiles, hypersonic glide vehicles, and swarm drone and missile attacks.

Concluding Thoughts

Any significant conflict involving nuclear weapons would threaten the survival of humanity. As a result, nuclear powers such as the United States, Russia, and China are working to increase the potency of their conventional weapons to further their international agendas. They are essentially playing a game of cat and mouse on an international level, leading to a new arms race with directed-energy weapons becoming its key elements. Based on publicly available information, the United States appears to be leading in the development and deployment of directed-energy weapons. While these weapons offer enormous potential to dominate the military landscape, their true capabilities and latest developments are closely guarded secrets.

As a result, I believe that directed-energy weapons are in development but hidden from the public. I make this statement knowing that much of my work, going back several decades, still remains secret—for example, my work on our most sophisticated communication satellites in the Milstar (Military Strategic and Tactical Relay) system and on one of our most deadly torpedoes, Mark 50, which is the U.S. Navy’s advanced lightweight torpedo for use against fast, deep-diving submarines. Although the United States publishes its defense budget, it guards many of its latest weapon developments by designating them as "black programs,” meaning knowledge about them requires a top-secret clearance and a “need to know.” However, those directed-energy weapons in the public domain serve as a means of plotting their development trajectory. Based on the information in this book, I think you will also conclude that directed- energy weapons will dominate warfare by 2050. The weapons of science fiction franchises such as Star Trek and Star Wars will be the weapons of world militaries. To my mind, one question remains: What technological strategy will the United States pursue to dominate the twenty-first-century battlefield?

3

The Coming Fourth U.S. Offset Strategy

The supreme art of war is to subdue the enemy w ithout fighting.

—Sun Tzu

I recognize understanding the U.S. m ilitary is extremely difficult. Much of the difficulty is intentional. The U.S. military is the best-trained, best-prepared, and m ost technologically sophisticated m ilitary in the world, and a veil of secrecy surrounds its strategies and weapons, Indeed, the U.S. military may make public statem ents that are deliberately misleading to confuse and confound potential adversaries. Unfortunately, those statem ents also confuse and confound Americans.

Is there any way to understand the U.S. m ilitary’s strategies and weapons technology? The answer is yes, and it has to do w ith its offset strategies. The U.S. m ilitary uses this term in a specific official context—th at is, to refer to weapons and technologies it pursues to gain an advantage over potential adversaries. As with m ost militaries, the U.S. m ilitary learned the importance of having an offset strategy through the blood, sweat, and tears of war, starting with the Korean War.

Before the war, the U.S. military's strategies and weapons technologies were improvisations to address contemporary and perceived needs. Similar to a three-ring circus, with lions in one ring, elephants in a second, and clowns in a third, the U.S. military lacked a cohesive forward­ looking strategy. If you think this view of the U.S. military is harsh, consider the U.S. Pacific Fleet's defeat via the Japanese sneak attack on Pearl Harbor on December 7,1941. At the time, the U.S. foreign policy of isolationism was not focused on defending the country. The National World War II Museum, focused on military history, characterizes the United States after the attack on Pearl Harbor as "ill-equipped and wounded.”1 It had no m ilitary-industrial complex. The U.S. Army was smaller than Portugal’s, ranking seventeenth in the world.2 Fortunately, in 1941, the m ainland of the United States remained out of easy reach of its new enemies —Japan, Germany, and Italy—however, we were at war and faced significant challenges. According to the National World War II Museum's website, "Meeting these challenges would require massive government spending, conversion of existing industries to wartime production, construction of huge new factories, changes in consumption, and restrictions on many aspects of American life. Government, industry, and labor would need to cooperate. Contributions from all Americans, young and old, men and women, would be necessary to build up what President Roosevelt called the ‘Arsenal of Democracy.’”1

In a sense, the attack on Pearl Harbor served as a tragic wake-up call. The famous quote attributed to Adm. Isoroku Yamamoto in the 1970 film Tora! Tora! Tora! rings true: “I fear all we have done is to awaken a sleeping giant and fill him with a terrible resolve.” To build the arsenal of democracy to fight World War II required establishing what President Eisenhower later called the military-industrial complex. The United States emerged from that war as a superpower, the sole country with nuclear weapons, but that distinction was about to change. On August 29, 1949, the Soviet Union detonated its first atom bomb. Almost in the blink of an eye, the United States’ former World War II ally became a potential adversary. The United States could no longer embrace isolationism. The short-lived peace crumbled into a Cold War.

The First U.S. Offset Strategy

A by-product of the Cold War was the splitting of Korea into two sovereign states. The government of the Democratic People's Republic of Korea (North Korea) was under the communist direction of Kim II Sung, while the government of the Republic of Korea (South Korea) was a capitalist state under the leadership of Syngman Rhee.4 Both governments claimed to be the sole legitimate government of all of Korea. This dispute set the stage for what became the first of many of the Cold War’s proxy wars. On June 25, 1950, with the support of China and the Soviet Union, North Korea invaded South Korea, igniting the Korean War1 As a result, the newly formed United Nations sent UN forces, led by the United States, to South Korea to repel the invasion.1

I was a young child at the time, but I can remember my older cousin going off to fight in the Korean War. It was a tense time in our family, especially after my cousin went missing in action. Fortunately, after several days U.S. forces found him, though he was unconscious and suffering from frostbite. Eventually, he recovered and returned home, no longer able to serve.

Although I was young, this incident from the early 1950s remains vivid in my memory. It likely affected other families throughout the United States in a similar way. The nation was still recovering from World War II. No one wanted another war.

On his return from Korea in early December 1952, President-elect Dwight D. Eisenhower, aboard the heavy cruiser uss Helena somewhere in the middle of the Pacific Ocean, conferred with several top incoming administration officials. In what speechwriter Emmet J. Hughes described as an “antiseptically spare and cold" conference room, the president-elect and his advisers strategized.7 Their focus was to end the Korean conflict they had inherited from President Harry Truman. Unfortunately, after witnessing the stalemate firsthand, they knew the geopolitical conflict favored the Soviet Union’s overwhelming conventional forces. The United States and its allies were fighting a large-scale war halfway around the world in the USSR's backyard. Eisenhower worried about the drain on U.S. and European resources, as well as the impact on the morale of war-weary Americans and Europeans. Distraught, he sought a strategic solution. During this bleak meeting, Secretary of State-designate John Foster Dulles advocated using the threat of America’s nuclear weapons to deter Soviet-backed expansionism. That resonated with Eisenhower.

Following the group’s return to the States and after having three handpicked teams surface strategic options, the Eisenhower administration adopted a new national defense policy, New Look, which emphasized using the United States’ superiority in nuclear weapons to offset the Soviets’ advantage in conventional weapons. Although the administration called this deterrence strategy New Look, history records it as the First U.S. Offset Strategy.3 Eventually, the North Korean military and the South Korean military signed an armistice on July 27, 1953—a cease-fire between the military forces but not a peace agreement between the two governments. I believe President Eisenhower’s New Look strategy was a crucial factor in securing the truce.

At this point, we must recognize the U.S. government controlled the program of nuclear weapons’ development and manufacture. Potential adversaries could not gain access to this technology except via espionage. Although the Soviets succeeded in doing that, in 1953 they still lagged the United States, which had a clear strategic advantage in both the technology and the number of nuclear weapons. Also, it is essential to recognize that an offset strategy needs to both deter war with potential adversaries and win it if necessary. The U.S. offset strategy, in this context, emphasized those military technologies that countered the advantages of its potential adversaries. In the case of the Korean War, New Look—that is, the First U.S. Offset Strategy—brought both sides to the negotiation table and led to an armistice.

The Second U.S. Offset Strategy

One aspect of technology is that it continually evolves, and its adoption spreads. Consider the telephone, for example. Alexander Graham Bell received U.S. Patent 161,739 for the phone in 1876 as an “apparatus for transmitting vocal or other sounds telegraphically." By 1900, there were about 600,000 phones in the United States; by 1910, there were 5.8 million, growing by almost a factor of ten in a decade. You can see from the wording of the patent, especially the word "telegraphically,” that the U.S. Patent Office considered the telephone an evolution of the telegraph. However, the development of this technology did not stop there. Initial phones, and many landlines still in use today, required wires to connect the user to the transmitter/receiver device, that device to a switchboard, and the switchboard to another transmitter/receiver device. Fast forwarding to the present, most people have smartphones, wireless devices that do a great deal more than send and receive telephone calls. A smartphone is a handheld computer with more computing power than NASA engineers had when they put a man on the moon. It also incorporates a camera and the ability to send text messages and photographs. The next point on its evolutionary path integrated the smartphone with a watch. Will the evolution stop here? Unlikely, but that is where we are as of this writing.

This short history of the telephone’s development and adoption illustrates how quickly technology evolves and spreads. With this understanding, let us return to offset strategies and their role in advancing military technologies. Similar to all technologies, the offset strategies also evolved and spread from the First U.S. Offset Strategy.

Meanwhile, the nuclear technologies of that first strategy developed. The first early nuclear weapons relied solely on a fission chain reaction. In the next-generation nuclear weapons, the fission chain reaction became the first step in causing a fusion chain reaction, giving rise to more powerful thermonuclear weapons. Soon, engineers discovered how to reduce the size of thermonuclear weapons and deliver them to their targets by intercontinental ballistic missiles. This evolution took time and the work of thousands of people. Even with all this development, however, starting in the 1960s, U.S. dominance in nuclear weapons began to diminish. The technology had spread to other nations.

By the mid- 1970s, six nations had nuclear weapons: the United States, Soviet Union, United Kingdom, France, China, and Israel.5 As the Cold War raged between the United States and the USSR, with near parity in nuclear weapons, it became increasingly apparent that the First U.S. Offset Strategy no longer afforded the United States a technological military advantage over the Soviet Union. Additionally, Warsaw Pact forces outnumbered NATO forces by three to one in Europe. Thus, the United States sought new strategies to regain its technological advantage.

Starting in the 1970s, under President Jimmy Carter, Defense Secretary Harold Brown directed the Department of Defense to begin investing in extended-range, precision- guided munitions, stealth aircraft, and space-based intelligence, surveillance, reconnaissance, communication, and navigation platforms.12 In 1980 Ronald Reagan’s administration continued to fund these technologies, many of which came to the public’s attention during the First Gulf War in 19 91. While the U.S. government did not officially label its development of these technologies, it became known as the Second U.S. Offset Strategy. In 1991 these technologies clearly gave the United States a distinct military advantage against its potential adversaries. With the dissolution of the Warsaw Treaty Organization on July 1, 1991, and the collapse of the USSR on December 25 of that year, the United States emerged as the only superpower.

Just as technologies evolve, going from prominence to obsolescence, the fortunes of nations also change, rising and falling. As the world’s only military superpower, the United States— after the 2001 terrorist attacks (9/11) on New York City, Pennsylvania, and the Pentagon— engaged in fighting global terrorism. While this was an import aspect of ensuring its national security, by concentrating its forces on this fight over the next two decades, the United States lost sight of the changing world.

In 2014 the Diplomat reported:

In a speech at the Reagan National Defense Forum (and accompanying memo), Defense Secretary Chuck Hagel announced the Pentagon’s new "Defense Innovation Initiative.”

As Hagel explained in the speech, “While we spent over a decade focused on grinding stability operations, countries like Russia and China have been heavily investing in military modernization programs to blunt our m ilitary’s technological edge"u

Hagel’s speech marked the end of the Second U.S. Offset Strategy, which some military historians characterized as the "American Way of War.”12

The U.S. government collaborated w ith industry (and built the m ilitary-industrial complex) and developed the technologies under the Second U.S. Offset Strategy. Most of these technologies, such as extended-range, precision-guided munitions and stealth aircraft, had no commercial application. As such, they were closely held secrets and not available in the open market. This is not the case in the Third U.S. Offset Strategy.

The Third U.S. Offset Strategy

As discussed in the introduction, the Third U.S. Offset Strategy was front and center from November 15, 2014, to the inauguration of Donald Trump as the forty-fifth president of the United States on January 20, 2017. During that time, it became a buzz phrase to justify “new” weapons and organizations; however, note that the U.S. military does not announce any technology or weapon unless it is already one or two generations ahead of whatever the military reveals. Here the path to the Third U.S. Offset Strategy was something out of a James Bond novel, complete with a secret organization and futuristic weapons.

In 2012 Barack Obama’s administration directed the Pentagon’s senior leadership to establish a secret new office, the Strategic Capabilities Office (sco), whose mission was to work on state-of-the-art weapons ranging from swarming micro drones to hypervelocity projectiles.11 The sco remained hidden from the public until Secretary of Defense Ash Carter unveiled his 2017 budget plan in a 2016 speech to the Economic Club of Washington.14 To the surprise of many, he pulled the curtain back on the shadowy sco, which shared the same building as the Defense Advanced Research Projects Agency.

You may wonder, as I did, why the Obama administration felt the need to create another DARPA-like organization. According to Defense News, a global website and magazine about politics, business, and technology of defense,

Although they share some DNA, the SCO's mission is different from that of DARPA. Whereas the latter is focused on finding and prototyping the game-changing technologies for the future fight, the sco is trying to understand current, existent needs and address them in new ways.

The most public example of an sco project is the Standard Missile 6, which [the sco] helped turn from a defensive weapon into a ship-killing one. It’s about taking current capabilities that exist and finding new ways to utilize them.11

Having worked with DARPA on numerous projects, the difference between it and the sco became immediately clear to me. Let me explain. As noted previously, while serving as Honeywell’s director of engineering focused on integrated circuit sensors, I worked on some highly advanced sensor technologies for the Department of Defense. In some cases, that meant working with DARPA, Honeywell’s partner on some of those technologies. At the time, I was the youngest director of engineering in Honeywell, and given my experience in developing commercial sensor products, I knew little about working with the DOD and nothing about working with DARPA. Fortunately, Honeywell had a corporate sales organization to help its executives work with DARPA.

I can vividly recall some elements of my first visit to DARPA in the early 1980s (DARPA moved to its new facility in 2012). At the time, DARPA’S headquarters resided at 3701 North Fairfax Drive in Arlington, Virginia. I always had pictured DARPA as having thousands of employees in a temple of doom surrounded by barbed wire fences and with armed guards around the perimeter. To my surprise, its headquarters was just another office building, but it did have a high-security entrance. The corporate sales representative who accompanied me had set up meetings to introduce me to the key people involved in my projects, including the then director of DARPA, Dr. Robert S. Cooper. My meeting with him was short and cordial. Although I was young with little experience working with the DOD, he respected my position in Honeywell and took time from his busy schedule to explain how DARPA operated. I had several takeaways from our meeting:

DARPA funded future weapons technologies that had the potential to be game changers.

DARPA programs occasionally failed, but that was expected, based on its mission to develop highly advanced weapons technologies.

DARPA had only about two hundred employees. The agency’s relatively small size would make it easy to get to know them. The director was right; in a short time, I was routinely interacting with the key DARPA personnel associated with my projects.

I was surprised at DARPA's size, for at the time, I managed almost twice the number of employees at Honeywell. Like many people, my previous knowledge of DARPA came from the movies. In reality, it is simply another government agency with a specific mission to develop future military game-changer technologies. While I cannot go into detail, working with DARPA’S personnel became routine, but the projects were extraordinary. My point in relating this story is to clarify the difference between DARPA and the SCO: DARPA focuses on creating breakthrough military technologies for ten, twenty, or even thirty years out, not for the near term; in the common vernacular, we called them blue-sky projects that were “DARPA hard.” The sco focuses on existing needs and applying current technology to address them.

When Secretary of Defense Carter unveiled the existence of the sco, I had little understanding of the impact it was about to have on the military-industrial complex. Now in the public eye, the sco and its then director, William Roper, began reaching out to the representatives of industry and the defense community to gather concepts and proposals to help the Pentagon with its near-term requirements.

The existence of the sco also helped explain Deputy Defense Secretary Bob Work’s comment in 2016 that the Third U.S. Offset Strategy’s initial vector was “to exploit all the advances in artificial intelligence and autonomy and insert them into DOD’S battle networks to achieve a step increase in performance” that the department believed would “strengthen conventional deterrence.”15 To those of us in the defense industry, we thought it would likely be an sco initiative. We also knew that we could take existing weapons technologies and propose new applications to the sco to address near-term needs.

In 2015 the Obama administration created another organization, the Defense Innovation Unit (DIU). Initially, the DIU’S mission was to work with Silicon Valley and help the military incorporate rapidly emerging, innovative commercial technologies. The DIU proved extremely useful to the DOD. As a result, it now has branches in Boston, Austin, and Washington DC, as well as a headquarters in Mountain View, California, the heart of Silicon Valley.

Just as it was becoming clear that the Third U.S. Offset Strategy had both a near-term thrust, via the SCO and the DIU, and a long-term thrust, via DARPA, the world changed. To most people's surprise, Donald Trump won the presidency in 2016. Following his inauguration in 2017, there was little mention of the Third U.S. Offset Strategy. The media began to speculate that it was dead.

Is the Third U.S. Offset Strategy Dead?

Most of us would like to think the U.S. military pursues technology on its merit, independent of politics; however, that is not the case. Politics strongly influences the m ilitary’s technological pursuits. The reason is simple: each president's administration sets national priorities and submits budgets to Congress to support those priorities, and the final budget determines the funded military programs that the Defense Department and the military­ industrial complex address. Unlike in the commercial market, you cannot "make the market” for military products by advertising and reducing prices to stimulate sales. Simply put, the DOD budget guides DOD procurements. For example, when President Bill Clinton took office, his administration put new acquisitions on hold for months while his administration set its national defense priorities. If you did not have a DOD contract in place, it was tough to get a new contract for anything not immediately critical to the national defense. At the time, I was responsible for Honeywell's integrated circuits and sensor sales. About half of my sales were to the DOD. The Clinton administration’s temporary hold on new procurements turned out to be a nightmare. We had significant layoffs and, in the end, still lost money. Eventually, the DOD funding started to flow again, but missing even a few months of revenue in a large company can be devastating. This example is one of many. Other presidents also want to ensure their administrations set national defense priorities and budget them accordingly.

If you keep in mind the role politics plays in setting national defense priorities, it provides a clue regarding why the phrase "Third U.S. Offset Strategy" fell out of vogue. The Third U.S. Offset Strategy was the brainchild of Obama’s Democratic administration. After Trump's Republican administration took office, little mention was made of the Third U.S. Offset Strategy. Do we still have a Third U.S. Offset Strategy? The answer is yes but with a caveat.

Although the Trump administration seldom uses the Obama administration's terminology, the organizations—sco, Diu, and. DARPA—and the pursuit of the technologies and weapons of the U.S. Third Offset Strategy remain in place and a high priority.12 Before we discuss this in more detail, we should review a critical weakness in the Third U.S. Offset Strategy.

A Weakness in the Third U.S. Offset Strategy

As mentioned in the introduction, the Third U.S. Offset Strategy focused on artificial intelligence, the backbone of autonomous weapons technologies. Unfortunately, this critical technology is also the United States’ Achilles’ heel. Ai technology is a dual-use technology, meaning in addition to its military applications, it has numerous commercial applications; thus, AI technology is commercially available. Also, some AI technologies are coming out of Chinese-owned companies in the United States. According to National Public Radio (NPR),

Instead of buying an existing U.S. business, these Chinese tech giants come to the U.S. and build new companies from the ground up, in what’s known as “greenfield” investments . . . [and] hire away a lot of U.S. employees who might otherwise work for American businesses....

This has become a concern in national security circles because the nature of emerging technology is inherently dual-use: The artificial intelligence algorithms that help speed up your smartphone could also be applied to weapons on the battlefield.

Thus, the U.S. government cannot control AI technology, which is a critical pillar of the Third U.S. Offset Strategy. The dual use of this technology and its access by potential adversaries represent a critical weakness in the Third U.S. Offset Strategy. This vulnerability raises an important question: Will the United States be able to maintain its superpower status in the decades to come?

The Future of the United States as a Superpower

Most likely, the United States will maintain its superpower status in the coming decades. While the United States will in all likelihood continue as a superpower, history may repeat itself. Similar to the way the Soviet Union was once considered a superpower, China may also emerge as a superpower. China may be reluctant to take on the same adversarial role the Soviet Union adopted, however, since becoming a hostile U.S. adversary would presumably lead to additional U.S. sanctions and hinder China's economic growth. Russia is unlikely to reemerge as a superpower as its economy is significantly behind those of the United States and China, and it suffers from systemic corruption. Given Russia’s legacy nuclear weapons and its ability to use espionage to gain military parity in specific weapons, however, it is likely to remain in its current position as a player on the international stage.

If this analysis is correct, Cold War II—discussed in chapter 1 as an ongoing state of political and military tension between opposing geopolitical power blocs—will become a “Conventional” Cold War. We can characterize the Conventional Cold War as a time when superpowers continually seek new and more potent conventional weapons.

The Conventional Cold War leaves us with two critical questions:

1. What will deter Russia’s further election meddling and aggression to occupy its neighbors, similar to its occupation of territory in Georgia and Ukraine?

2. What will deter China’s further intellectual property thefts, cyberattacks, and sovereignty-driven actions in the China Sea?

From my perspective, the answers should not involve open conflict with conventional weapons. The might of conventional weapons is approaching the devastating power of nuclear weapons, so they are likely to have the same dire consequences for humanity. For example, high-intensity laser attacks on an adversary may result in a “laser winter” similar to a nuclear winter, which is a by-product of the smoke rising from the fires following a nuclear attack. The destructive power of high-intensity lasers may result in the same type of fires, thus giving rise to a winter that would be just as dangerous a threat to humanity as a nuclear winter. Either could lead to humanity’s extinction.

While humanity has amply displayed its warlike aggressive nature, people are generally not suicidal. We have exhibited restraint in using nuclear weapons; thus, I believe we will likewise show restraint in using those conventional weapons that can replicate nuclear devastation. Given this information, I think the United States, alone, will be unable to deter future Russian and Chinese military aggression.

The critical word in the preceding sentence is "alone.” Both Russia and China lack one thing that the United States has—namely, alliances. A recent article in the Hill termed them the United States' "Fourth Strategic Offset.”— This excerpt explains why these alliances are considered a strategic offset:

America’s unique and inimitable strategic advantage is our global alliance and partner network. There is none like it, and neither China nor Russia can create a similar network, despite their efforts. This global archipelago of like-minded states includes our treaty allies in NATO, Japan, Korea, Thailand and ANZUS [Australia, New Zealand, and United States Security Treaty], as well as dependable partners such as Sweden, Israel and potentially India, among others. Those who argue geography is irrelevant in the digital age are sadly mistaken. There is no substitute for presence, and our allies and partners allow us a global presence no peer competitor or technological enhancement can match —a presence that acts as a deterrent against aggression of the heavy metal or the gray zone type.22

In this Fourth U.S. Offset Strategy, military alliances thus share an equal footing with military technology.

The Fourth U.S. Offset Strategy

Just as each presidential administration sets a national security strategy, the Trump administration did so in establishing the "2018 National Defense Strategy.” The respective report recognizes that we Americans "are emerging from a period of strategic atrophy, aware that our competitive military advantage has been eroding.” It views China, Russia, North Korea, Iran, and terrorist groups as threats to peace. It sets a new priority in dealing with these threats: "Inter-state strategic competition, not terrorism, is now the primary concern in U.S. national security.”21

Technologies and weapons are highlighted in the first section of the “2018 National Defense Strategy”: “New technologies include advanced computing, ‘big data' analytics, artificial intelligence, autonomy, robotics, directed energy, hypersonics, and biotechnology— the very technologies that ensure we will be able to fight and win the wars of the future.”— For the most part, the strategy continues those military technology strategies of the Third U.S. Offset Strategy, but it includes additional strategic thrusts, such as directed-energy weapons and hypersonic missiles, glide vehicles, and projectiles.

The second section of the document speaks to the importance of alliances: "Mutually beneficial alliances and partnerships are crucial to our strategy, providing a durable, asymmetric strategic advantage that no competitor or rival can match. This approach has served the United States well, in peace and war, for the past 75 years. Our allies and partners came to our aid after the terrorist attacks on 9/11 and have contributed to every major U.S.- led military engagement since. Every day, our allies and partners join us in defending freedom, deterring war, and maintaining the rules which underwrite a free and open international order.’’22

While the Trump administration does not explicitly state that the "2018 National Defense Strategy” is the Fourth U.S. Offset Strategy, it is. To my eye, it includes three significant strategic changes to the Third U.S. Offset Strategy:

1. It recognizes the greatest threats to U.S. national security are China and Russia, which have modernized their militaries during the last two decades.

2. It emphasizes new military technology thrusts in directed-energy weapons; hypersonic missiles, glide vehicles, and projectiles; and the militarization of space.

3. It views alliances as an asymmetric strategic advantage.

#### At worst, it prevents nuke war

Boetel 21 [RYAN BOETEL, JOURNAL STAFF WRITER, "‘Star Wars’ no longer fiction", 8/20/21, https://www.abqjournal.com/2421301/star-wars-no-longer-fiction.html]

Force fields protecting us from drones and missiles.

Guns that shoot lasers instead of firing bullets.

Rock ’em Sock ’em Robots zapping at each other on the battlefield.

A new report by the Air Force Research Laboratory titled Directed Energy Futures 2060 describes the sorts of “directed energy” weapons that may come to exist in the next 40 years. And the expected technology – much of which may be researched and developed in Albuquerque – is like something out of a science fiction movie.

Officials from multiple Department of Defense entities, partners with the North Atlantic Treaty Organization and other experts came together to write the report, which says the world is at a “tipping point.”

Soon, the report says, harnessing directed energy power will be critical for military success. The report’s authors make the case that in order for America to stay competitive in the field with rival nations such as China and Russia, more investment in the research and development of directed energy and educating a future directed energy workforce is needed.

“We’re seeing a lot more directed energy capabilities in the military space. People are using them for weapons worldwide,” said Jeremy Murray-Krezan, the assistant chief scientist of AFRL’s Directed Energy Directorate and one of the report’s authors. The directorate is based at Kirtland Air Force Base.

A conceptual drawing of future warfare where directed energy power is deployed. A recent report on directed energy said the world is at a “tipping point,” and soon directed energy weapons will be critical to military success.(Courtesy Raytheon Technologies)

Directed energy weapons convert different frequencies of electromagnetic waves and light into a high-power pulse to shoot at a target. And such weapons already exist.

AFRL, for instance, is currently in late-stage testing of the Tactical High-power Operational Responder, or THOR, which can shoot microwaves to destroy drones. The idea is that the weapon can protect military bases.

Murray-Krezan said the Air Force has also developed mounted guns that shoot laser beams instead of bullets.

Similar weapons are being created in other countries. Murray-Krezan noted that all of the top 10 militaries in the world have some sort of directed energy program.

“It may not be at the scale of the Cold War,” he said, “but I think we might already be seeing something of an arms race.

Center of research

If the arms race for directed energy indeed takes off, much of the action could take place in Albuquerque.

Both on and off KAFB, Albuquerque in the past 40 years has become a mecca of sorts for that type of science, said Edl Schamiloglu, a distinguished professor in the University of New Mexico’s School of Engineering, who specializes in directed energy.

UNM is preparing to launch a Directed Energy Center, which will make the university one of a handful in the country with a center dedicated to that type of research and the only one that has expertise in both lasers and microwaves, he said.

“Albuquerque, New Mexico, is the epicenter of directed energy research in the United States,” Schamiloglu said. “In addition to the activity that goes on at AFRL internally, AFRL supports research at Sandia National Labs and Los Alamos (National Laboratory). And there are dozens of companies that support directed energy … in town. So I think directed energy research and development will be an important component in economic development in the city and the state for decades, for sure.”

Future technologies

In 1983, President Ronald Reagan proposed a Strategic Defense Initiative, which came to be known as Star Wars. It was the height of the Cold War, and the conservative icon imagined an array of satellites that could shoot X-rays to stop nuclear weapons from reaching the country’s borders.

Despite billions of spending on the effort, the project remained science fiction until it was significantly narrowed by President Bill Clinton in 1993, according to Politico.

The recent directed energy report revisits the idea.

Murray-Krezan said technology used in the THOR project could be applied to a fleet of satellites that could, in theory, bring the “Star Wars” defense shield into reality.

#### And, solves asteroids and comets

Nowakowski 16 [Tomasz Nowakowski, Astrowatch.net, "Could a laser weapon save earth from killer asteroids?", 3/2/16, https://phys.org/news/2016-03-laser-weapon-earth-killer-asteroids.html]

Potentially hazardous asteroids are still looming large in the minds of scientists engaged in planetary defense issues. Numerous strategies describing deflection of near-Earth objects (NEOs) have been proposed, including methods employing kinetic impactors, robotic mining, and gravity tractors. However, one of the concepts has recently received attention as one of the most serious proposals.

The project, named DE-STAR (Directed Energy System for Targeting of Asteroids and exploRation), envisions a large phased-array laser in Earth orbit to deflect asteroids, comets, and other NEOs endangering the planet. There is also a much smaller, though similar system being considered, called DE-STARLITE, that could travel alongside the target, slowly deflecting it from nearby over a long period.

According to the authors of these proposals, their goal was to create an orbital planetary defense system capable of heating the surface of potentially hazardous objects to the point of vaporization. They emphasize that vaporization on the surface of an object continually ejects vaporized material, creating a reactionary force that pushes the object into a new path. This can be accomplished by lasers deployed on spacecraft stationed near the asteroid.

The system should be capable of projecting a laser at a distant asteroid with sufficient flux to heat a spot on the surface and vaporize solid rock. Currently, high-powered lasers deliver sufficient energy density to melt and vaporize any known material.

"Generally speaking, the technology is available today. The main challenge with building a full DE-STAR is the necessary scale to be effective," Qicheng Zhang of the University of California, Santa Barbara, one of the authors of the project, told Astrowatch.net.

Zhang and his colleagues claim that if DE-STAR had a 330-feet-wide phased laser array, it could divert volatile-laden asteroids 330 feet in diameter by initiating engagement at about two million miles. However, DE-STARLITE, being a much smaller and less expensive system, is the more practical option. For instance, a 20 kW version of DE-STARLITE operating for 15 years could deflect an Apophis-size (1,066 feet) asteroid at a distance equal to Earth's diameter. A 1 MW version could deflect all known threats up to 1,640 feet in diameter with five-year laser activity.

"The bigger the NEO, the longer the time needed. The bigger the laser, the shorter the time needed. With a very small 20 kW DE-STARLITE, a 300-meter-wide (1,000 foot) asteroid can be deflected in 15 years. Smaller asteroids can be deflected in under a year, after the spacecraft's arrival at the asteroid," Zhang said.

According to the scientists, DE-STARLITE would be ineffective at deflecting targets on short notice due to the time required for transit to the target asteroid. Thus the DE-STAR system seems to be a last line of defense on short notice.

A full stand-off system like DE-STAR is still considered as a possibility for the more distant future for its ability to rapidly respond to identified threats. It could also provide one of the few options for defense against long-period comets, which modern technology is often incapable of reaching by spacecraft.

#### Asteroids cause extinction and nuclear misattribution—they’re aperiodic but certain

Baum 19 (Executive director of the Global Catastrophic Risk Institute,“Risk-Risk Tradeoff Analysis of Nuclear Explosives for Asteroid Deflection,” May 31, 2019, https://onlinelibrary.wiley.com/doi/epdf/10.1111/risa.13339.)

The most severe asteroid collisions and nuclear wars can cause global environmental effects. The core mechanism is the transport of particulate matter into the stratosphere, where it can spread worldwide and remain aloft for years or decades. Large asteroid collisions create large quantities of dust and large fireballs; the fire heats the dust so that some portion of it rises into the stratosphere. The largest collisions, such as the 10km Chicxulub impactor, can also eject debris from the collision site into space; upon reentry into the atmosphere, the debris heats up enough to spark global fires (Toon, Zahnle, Morrison, Turco, & Covey, 1997). The fires are a major impact in their own right and can send additional smoke into the stratosphere. For nuclear explosions, there is also a fireball and smoke, in this case from the burning of cities or other military targets.

While in the stratosphere, the particulate matter blocks sunlight and destroys ozone (Toon et al., 2007). The ozone loss increases the amount of ultraviolet radiation reaching the surface, causing skin cancer and other harms (Mills, Toon, Turco, Kinnison, & Garcia, 2008). The blocked sunlight causes abrupt cooling of Earth’s surface and in turn reduced precipitation due to a weakened hydrological cycle. The cool, dry, and dark conditions reduce plant growth. Recent studies use modern climate and crop models to examine the effects for a hypothetical IndiaPakistan nuclear war scenario with 100 weapons (50 per side) each of 15KT yield. The studies find agriculture declines in the range of approximately 2% to 50% depending on the crop and location.11 Another study compares the crop data to existing poverty and malnourishment and estimates that the crop declines could threaten starvation for two billion people (Helfand, 2013). However, the aforementioned studies do not account for new nuclear explosion fire simulations that find approximately five times less particulate matter reaching the stratosphere, and correspondingly weaker global environmental effects (Reisner et al., 2018). Note also that the 100 weapon scenario used in these studies is not the largest potential scenario. Larger nuclear wars and large asteroid collisions could cause greater harm. The largest asteroid collisions could even reduce sunlight below the minimum needed for vision (Toon et al., 1997). Asteroid risk analyses have proposed that the global environmental disruption from large collisions could cause one billion deaths (NRC, 2010) or the death of 25% of all humans (Chapman, 2004; Chapman & Morrison, 1994; Morrison, 1992), though these figures have not been rigorously justified (Baum, 2018a).

The harms from asteroid collisions and nuclear wars can also include important secondary effects. The food shortages from severe global environmental disruption could lead to infectious disease outbreaks as public health conditions deteriorate (Helfand, 2013). Law and order could be lost in at least some locations as people struggle for survival (Maher & Baum, 2013). Today’s complex global political-economic system already shows fragility to shocks such as the 2007- 2008 financial crisis (Centeno, Nag, Patterson, Shaver, & Windawi, 2015); an asteroid collision or nuclear war could be an extremely large shock. The systemic consequences of a nuclear war would be further worsened by the likely loss of major world cities that serve as important hubs in the global economy. Even a single detonation in nuclear terrorism would have ripple effects across the global political-economic system (similar to, but likely larger than, the response prompted by the terrorist attacks of 11 September 2001).

It is possible for asteroid collisions to cause nuclear war. An asteroid explosion could be misinterpreted as a nuclear attack, prompting nuclear attack that is believed to be retaliation. For example, the 2013 Chelyabinsk event occurred near an important Russian military installation, prompting concerns about the event’s interpretation (Harris et al., 2015).

The ultimate severity of an asteroid collision or violent nuclear conflict use would depend on how human society reacts. Would the reaction be disciplined and constructive: bury the dead, heal the sick, feed the hungry, and rebuild all that has fallen? Or would the reaction be disorderly and destructive: leave the rubble in place, fight for scarce resources, and descend into minimalist tribalism or worse? Prior studies have identified some key issues, including the viability of trade (Cantor, Henry, & Rayner, 1989) and the self-sufficiency of local communities (Maher & Baum, 2013). However, the issue has received little research attention and remains poorly understood. This leaves considerable uncertainty in the total human harm from an asteroid collision or nuclear weapons use. Previously published point estimates of the human consequences of asteroid collisions12 and nuclear wars (Helfand, 2013) do not account for this uncertainty and are likely to be inaccurate.

Of particular importance are the consequences for future generations, which could vastly outnumber the present generation. If an asteroid collision or nuclear war would cause human extinction, then there would be no future generations. Alternatively, if survivors fail to recover a large population and advanced technological civilization, then future generations would be permanently diminished. The largest long-term factor is whether future generations would colonize space and benefit from its astronomically large amount of resources (Tonn, 1999). However, it is not presently known which asteroid collisions or nuclear wars (if any) would cause the permanent collapse of human civilization and thus the loss of the large future benefits (Baum et al., 2019). Given the enormous stakes, prudent risk management would aim for very low probabilities of permanent collapse (Tonn, 2009).

knowledge, no studies have analyzed the risk of major wars in a post-nucleardisarmament world.

#### Comet diseases cause extinction

**Joseph** and Wickramasinghe **10** (Rhawn Joseph is an American neuropsychologist and writer, Chandra Wickramasinghe, Director of the Buckingham Centre for Astrobiology, University of Buckingham “Comets and Contagion: Evolution, Plague, and Diseases From Space”, Journal of Cosmology 2010, Vol 7, 1750-1770, January, https://www.researchgate.net/publication/326160954\_Comets\_and\_Contagion\_Evolution\_Plague\_and\_Diseases\_From\_Space)

For much of history comets have been associated with death and disease. There is increasing evidence that life on Earth originated in comets and other stellar debris. If passing comets have continued to deposit viruses and microorganisms on this planet, this may explain why ancient astronomers and civilizations attributed the periodic outbreak of plague to these stellar objects. Moreover, the subsequent evolution and extinction of life may have been directly impacted by the continued arrival of bacteria, archae, viruses, and their genes from space. On this picture the evolution of higher plants and animals, including humans, would be impacted by the insertion of genes from space, as well as recurrent episodes of pandemic disease. Near-culling pandemics and extinction episodes have in fact been preceded by or followed by inserts of viral genes into survivors who have transmitted these viral elements to their progeny, thereby impacting future evolution. Although ancient fears and reverence of comets may be coincidental with the outbreaks of pandemics, they may also have a factual basis.

#### The United States federal government should substantially increase its prohibitions on anticompetitive business practices by private electricity and/or gas corporations by reducing application of regulatory antitrust immunities.

### Advantage Two is Prices

#### Filed rate immunizes manipulation of market prices for utility profits. Causes blackouts and energy price hikes.

Vaheesan 19 [Sandeep Vaheesan is legal director at the Open Markets Institute. Vaheesan previously served as a regulations counsel at the Consumer Financial Protection Bureau, where he helped develop and draft the first comprehensive federal rule on payday, vehicle title, and high-cost installment loans. Paula Bliss, of counsel, Bernheim Kelley Battista & Bliss, MARK A. GOTTLIEB Counsel of Record PUBLIC HEALTH ADVOCACY INSTITUTE, PNE Energy Supply LLC, On Behalf Of Themselves And Others Similarly Situated V. Eversource Energy And Avangrid, Inc. Motion Of Open Markets Institute For Leave To File Amicus Curiae Brief In Support Of Plaintiff-Appellant. 10/25/19, https://static1.squarespace.com/static/5e449c8c3ef68d752f3e70dc/t/5eaa1d9d2790182e187cc171/1588207017816/19-1678\_Documents-as-filed.pdf]

\*italics from original document

Under a system of market-based pricing, full and robust antitrust enforcement is vital to protect the public from the collusive, exclusionary, and other unfair practices of producers and traders of electricity and natural gas. See Alfred E. Kahn, Deregulatory Schizophrenia, 75 Calif. L. Rev. 1059, 1059 (1987) (“While prepared to defend enthusiastically the deregulations with which I have been involved, I feel equally strongly that they have greatly accentuated the importance of antitrust enforcement.”). In this case, however, the court expanded the filed rate doctrine, which was created to protect the integrity of regulator-approved rates, to immunize Eversource Energy and Avangrid’s manipulation of market prices for electricity and gas from a private antitrust lawsuit. In broadening the filed rate doctrine to dismiss the plaintiff-appellant’s lawsuit, the district court granted a de facto license for sellers of gas and electricity to use their market power to transfer millions or even billions of dollars from the public into their own coffers.

Plaintiff-appellant accuses Eversource Energy and Avangrid (two vertically integrated utilities that distribute gas and electricity to end-use customers and own power generation assets) of misusing their market power at the natural gas resale level and engineering a chain of events that inflicted substantial harm on New England residents. The defendants-appellees abused their gas pipeline use rights to create an artificial shortage of resale gas, a key input for generating electricity in New England. By limiting the supply of gas in New England and raising the price of natural gas, the defendants-appellees increased the costs of generating electricity. And by raising the costs of generating electricity, they increased wholesale electricity prices and ultimately retail electricity costs for New Englanders by more than $3 billion.

Over the past four decades, legislators and regulators have limited and even withdrawn public utility regulation over the production and sale of natural gas and the generation of electricity and introduced market-based pricing in these areas. In lieu of cost-of-service regulation, market-based pricing now governs the sale of gas at the wellhead where gas is produced, the resale of surplus gas to purchasers like electricity generators, and the sale of electricity at the wholesale level. In contrast to the previous regulated environment, the conduct of sellers in these markets is today “governed in the first instance by business judgment, and not regulatory coercion.” Otter Tail Power Co. v. United States, 410 U.S. 366, 374 (1973).

As these legislative and regulatory decisions have lifted traditional price controls, participants in the wellhead gas, gas resale, and wholesale electricity markets exercise discretion that they previously did not have. Competition in wellstructured markets constrains this private discretion and can ensure the availability of plentiful and affordable gas and electricity. When markets are concentrated or when market participants engage in collusive, exclusionary, or other unfair practices, however, this private discretion becomes private power. Under these circumstances, sellers can use their unilateral or collective market power to profit at the expense of purchasers of gas and electricity.

As the plaintiff-appellant alleges, the risk of misconduct in these markets is real. And the alleged misconduct is not an aberration. In electricity markets, generators have engaged in market power abuse on a recurring basis. This abuse was most powerfully illustrated in the California electricity crisis in 2000. In-state generators with market power created artificial shortages of electricity and caused price spikes and rolling blackouts in the state, extracting billions of dollars in private taxes from the public. Severin Borenstein, James B. Bushnell & Frank A. Wolak, Measuring Market Inefficiencies in California’s Restructured Wholesale Electricity Market, 92 Am. Econ. Rev. 1376 (2002).

#### And, high prices undermine growth—addressing anticompetitive conduct solves

Moss 13 [Diana Moss is Vice President and Director, American Antitrust Institute (AAI), and Sandeep Vaheesan is Special Counsel, AAI, "Collusive Agreements in the Energy Industry: Insights into U.S. Antitrust Enforcement", 1/10/13, https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2198539&download=yes]

The importance of the energy sector in the U.S. economy needs little explanation. According to the Energy Information Administration (EIA), Americans spent over $1 trillion, or roughly eight percent of U.S. gross domestic product, on energy in 2009.4 Energy expenditures comprise a major fraction of household budgets in the U.S. EIA estimates show that U.S. households spent an average of $2,024 on energy for heating in 20095 and $2,832 on gasoline in 2011.6

Because energy is the lifeblood of the modern economy, energy prices play a critical role in economic growth. Although the U.S. economy is not as energy intensive as it was several decades ago,7 rising energy prices can still slow economic growth. As an important input for industry and transportation, higher energy prices increase costs and lower profits. Moreover, consumers’ ability to modify their energy use and transportation arrangements in the short run is limited8 and only mildly responsive to short run changes in prices.9 Higher energy prices can take a particularly large toll on low-income households that spend a larger fraction of their budgets on energy than middle- and upper-income households.10

Because of the important macroeconomic and microeconomic role of energy prices, anticompetitive conduct in energy markets can be particularly harmful. Petroleum markets are vulnerable to collusive agreements, and the incidence of anticompetitive behavior at multiple levels in the supply chain compounds the adverse effects on consumers. Cartelization of the global crude oil market by the Organization of Petroleum Exporting Countries (OPEC) is one of the most well known examples. OPEC’s decision to restrict crude oil production in the early 1970s plunged much of the world economy into recession.11 Anticompetitive agreements also extend to price fixing at the retail level for products such as diesel and gasoline. Agreements to fix and raise prices between local competing retailers of refined petroleum products directly harm consumers by extracting supracompetitive prices on an essential commodity for which consumers cannot easily adjust consumption in the short run. More recently, collusion has surfaced in auctions for oil and gas exploration leases on federal and private land. Agreements between bidders not to compete against each other depress prices and reduce an important revenue stream for the government.12

The pernicious effects of collusive schemes in energy are not limited to petroleum markets. On a more local level, anticompetitive agreements between sellers in regional wholesale electricity markets have forced consumers to pay hundreds of millions of dollars more for electricity than they would have in the absence of such conduct. In these markets, which are structurally vulnerable to the exercise of market power, anticompetitive agreements spanning even a short time can result in large wealth transfers from consumers to suppliers.13

Collectively, these examples illustrate the serious harm to consumers and to the economy that flow from collusive agreements, making the case for rigorous Section 1 enforcement. A key component of Section 1 enforcement, however, is the choice of enforcement approach (e.g., criminal vs. civil) and remedy, the effectiveness of which is gauged by how well it deters future collusive behavior.consumers cannot easily adjust consumption in the short run. More recently, collusion has surfaced in auctions for oil and gas exploration leases on federal and private land. Agreements between bidders not to compete against each other depress prices and reduce an important revenue stream for the government.12 The pernicious effects of collusive schemes in energy are not limited to petroleum markets. On a more local level, anticompetitive agreements between sellers in regional wholesale electricity markets have forced consumers to pay hundreds of millions of dollars more for electricity than they would have in the absence of such conduct. In these markets, which are structurally vulnerable to the exercise of market power, anticompetitive agreements spanning even a short time can result in large wealth transfers from consumers to suppliers.13 Collectively, these examples illustrate the serious harm to consumers and to the economy that flow from collusive agreements, making the case for rigorous Section 1 enforcement. A key component of Section 1 enforcement, however, is the choice of enforcement approach (e.g., criminal vs. civil) and remedy, the effectiveness of which is gauged by how well it deters future collusive behavior.

#### New energy inflation triggers US recession

Falath 1/7 [Jujaj Falath, senior analyst at the National Bank of Slovakia and a visiting lecturer in economics at the Comenius University in Bratislava, Martin Pažický, economist at the Institute for Financial Policy at the Ministry of Finance of the Slovak Republic and a visiting lecturer at the Faculty of Management, Comenius University in Bratislava. “The big risk now for the US is not hyperinflation, but long-term elevated inflation rates”. 1/7/22. https://blogs.lse.ac.uk/usappblog/2022/01/07/the-big-risk-now-for-the-us-is-not-hyperinflation-but-long-term-elevated-inflation-rates/]

Although some price increases were expected, US inflation figures have now consistently exceeded economists’ expectations. Seven of the last ten CPI inflation readings surprised analysts on the upside, while none of them surprised on the downside. Risks include new, more transmissible COVID mutations, slower vaccine rollouts (causing supply bottlenecks in emerging countries), and lower vaccine efficacy, supply chain disruptions, climate threats, and rising property and energy prices.

Sustained high inflation is mixed news for debts. A moderate amount of inflation above target could help wipe out some of the record government debt burden and allow countries to consolidate. However, if inflation gets out of control and central banks have to slam on the brakes by sharply raising rates, those record debt levels will hurt much more. Furthermore, suppressing economic activity too sharply could spur another recession.

Inflation soared because of COVID

To understand whether we should panic about inflation, we need a deeper discussion of the current sources of inflationary pressures. In principle, the only source of inflation that should spur a contractionary macroeconomic policy response (either monetary by higher interest rates, or fiscal by smaller budget deficits) is inflation driven by the labour market. When workers have enough bargaining power to secure a pay rise that outpaces the long-term potential of the economy, there is a risk of “overheating”. Only this situation, where wage growth runs ahead of productivity growth, should lead to macroeconomic policy intervention. Other supply-related sources of inflation (for example, commodity prices) are volatile and driven primarily by global markets. These inflationary pressures are not the result of overheating and are far more likely to be temporary.

At the beginning of 2021, the main factors driving the rise in inflation were energy prices and factors associated with the reopening of the US economy. Both are usually temporary. Since the second quarter of 2021, however, the rise in CPI inflation has been increasingly driven by rises in the prices of core goods not related to reopening (Figure 1, green columns). This might indicate that inflation is growing more persistent.

The world is currently facing the most severe energy shock in recent decades. The prices of gas and electricity have reached record highs. Partly, this can be seen as compensation for exceptional price falls in 2020, when many factories were forced to halt production. Lifting restrictions boosted demand for commodities, which has resulted in rising energy prices. More expensive emission allowances, representing a form of green tax, have also contributed. As winter sets in, the demand for natural gas and oil is rising. Since stocks are limited, the severity of the situation will depend on how low temperatures drop.

#### That ripples through the whole economy.

Salzman 11/9 [Avi; November 9; Senior writer at Barron's, covering stocks, the economy, and the impact of new technology on financial markets; *Barron’s,* “High Energy Prices Are Rippling Through the Economy,” <https://www.barrons.com/articles/high-energy-prices-are-rippling-through-the-economy-51636477167>]

The latest government inflation figures show that prices are rising fast, and much of the momentum is coming from energy. The trends are already hitting businesses in several industries and will continue rippling through the economy. Investors should keep an eye out for shrinking margins—and possibly pressure on valuation—in the months ahead.

On Tuesday, the Bureau of Labor Statistics released the monthly producer price index, which measures prices of goods and services as they make their way through the supply chain. The report showed that the PPI rose 0.6% in October on a month-over-month basis, and 8.6% on a year over year basis, in line with economists’ expectations.

The consumer price index, which measures prices at the retail level, is scheduled to be released on Wednesday. That report is likely to show that escalating energy prices are forcing consumers to pay up for heating oil, propane, gasoline, and other fuels.

“I think more pain is going to come to the consumer, certainly, for this winter,” said Marcus McGregor, an energy analyst at asset manager Conning. “I think if you look at the latest reports, costs for propane, natural gas and any sources that are leading into the consumer’s home—if we have a really cold winter—are expected to increase significantly this winter. So I see more pain before relief when it comes to the U.S. consumer.”

Businesses are already having to adjust. The PPI shows how the escalating energy costs are affecting corporations—and how they may end up flowing through to consumers in several industries. The price of goods that were at the final stage of production (as opposed to component parts) rose 1.2% in the month, with three quarters of that jump having to do with a rise in the price of energy, according to the report. In October, oil prices rose 13%. Natural gas prices were flat in October, after jumping 34% in September, the largest one-month gain in 12 years.

That has been a boon for energy companies, which have led the market higher this year after trailing for much of the previous decade. Exxon Mobil (ticker: XOM) stock has soared 58% this year, and BP (BP) is up 34%.

But escalating energy prices are a draw on several other industries. Consumer goods get more expensive because it costs more to truck them to warehouses and stores.

“Higher commodity and freight cost impacts combined were a 400 basis point hit to gross margins,” said Procter & Gamble (PG) CFO Andre Schulten on the company’s earnings call last month.

Airlines get pinched, too, because fuel can account for about one-fifth of their expenses. Delta Air Lines (DAL), for instance, said on its latest earnings call that high fuel prices “will pressure our ability to remain profitable in the December quarter.”

“At present time, we’re expecting a modest loss in the fourth quarter with crude prices driving that up nearly 60% year-to-date and more than 15% just over the last month,” said CEO Ed Bastian.

Companies that make or process fuels and chemicals often run on natural gas. Refinery operator Valero Energy (VLO) said that its refinery operating expenses rose 6% in the third quarter largely because of higher natural gas prices. And any other business—including office work—that uses substantial amounts of electricity can be hurt when energy prices rise. Natural gas now accounts for the largest share of U.S. electricity generation.

Industrial companies can be hit too, as their operating expenses rise. Processed fuels used in manufacturing—things like oils, greases, natural gas, and diesel—are on average 34% more expensive than they were a year ago, according to the PPI. That, along with supply-chain problems around the world, are causing some industrial companies to warn investors that their margins could be hurt.

German chemicals company BASF (BASFY) said that high natural gas prices cost it 600 million euros in the first nine months of the year, but that October prices increases would make its operations even more expensive.

“Throughout basically all value chains, our suppliers, our customers and we ourselves continue to be confronted with increasing raw material, energy and transportation costs, supply chain constraints and the related and largely unforeseeable issues with material availability,” said CEO Martin Brudermüller on the company’s latest earnings call.

It’s a global problem that won’t be going away soon, and one that consumers are starting to feel too.

#### Uniquely undermines consumption which kills growth

The Economist 21 [The Economist, "How soaring energy costs could hobble the covid-19 recovery", 10/23/21, https://www.economist.com/finance-and-economics/2021/10/23/how-soaring-energy-costs-could-hobble-the-covid-19-recovery]

The inflationary consequences of costly energy are already apparent. In the euro area, headline annual inflation jumped to 3.4% in September, thanks to a 17.4% leap in energy costs. Underlying “core” inflation (which excludes food and energy prices) rose by a more modest 1.9%. In America underlying inflation ran hotter in September, at 4%. But a 24.8% increase in energy costs pushed the headline rate up even higher, to 5.4%. These figures are likely to rise further in coming months, since rocketing fuel prices in October have not yet made their way into the statistics.

The contribution of energy to inflation will begin to fade once prices plateau—as they may in coming months, and even sooner if winter proves no colder than usual. Recent analysis by economists at Goldman Sachs, a bank, suggests that the effect of energy costs on America’s year-on-year inflation rate stood at 2.15 percentage points in September and will likely rise to 2.5 percentage points by the end of this year—taking the headline rate to 5.8%, holding other components constant—before eventually turning slightly negative by the end of 2022.

What about the damage to growth? The predominant factor, in the near term at least, is the effect on consumption and investment. Over short time horizons, households and firms cannot easily cut energy use in response to rising costs, leaving less to spend on other goods and services. This effect, according to work by Paul Edelstein of State Street, a bank, and Lutz Kilian of the Federal Reserve Bank of Dallas, is concentrated in the consumption of durable goods; a rise of 10% in the price of energy is associated with a 4.7% decline in spending on durables (and a particularly large drop in purchases of vehicles).

Yet the researchers also note that consumption tends to fall by more in response to rising fuel costs than you might expect given the share of energy in budgets. That seems to be because energy shocks tend to depress sentiment. James Hamilton of the University of California, San Diego, studies historical oil shocks and finds that a 20% rise in the real price of energy is associated with a 15-point drop in an index of consumer confidence. (A gauge of American sentiment collected by the University of Michigan has fallen by nearly 17 points since April 2021.)

An energy-induced slump could be mitigated if consumers meet higher bills by drawing on savings. By the end of 2020, households across large rich economies had accumulated “excess”, or above-normal, savings equivalent to more than 6% of gdp. Nonetheless, analysts at Goldman reckon that costly energy will reduce the growth rate of consumption in America by 0.4 percentage points this year, and by 0.5 points in 2022. Those inclined to see the petrol tank as half full may note that slower consumption growth could help ease strains on supply chains, which have been stressed by especially strong demand for durable goods. Those who grumble that it is half empty may worry that power cuts in places like China could result in still more shortages.

#### Econ decline causes great power war

Liu 18, [Qian Liu is an economist based in China, The next economic crisis could cause a global conflict. Here's why, https://www.weforum.org/agenda/2018/11/the-next-economic-crisis-could-cause-a-global-conflict-heres-why/]

The response to the 2008 economic crisis has relied far too much on monetary stimulus, in the form of quantitative easing and near-zero (or even negative) interest rates, and included far too little structural reform. This means that the next crisis could come soon – and pave the way for a large-scale military conflict.

The next economic crisis is closer than you think. But what you should really worry about is what comes after: in the current social, political, and technological landscape, a prolonged economic crisis, combined with rising income inequality, could well escalate into a major global military conflict.

The 2008-09 global financial crisis almost bankrupted governments and caused systemic collapse. Policymakers managed to pull the global economy back from the brink, using massive monetary stimulus, including quantitative easing and near-zero (or even negative) interest rates.

But monetary stimulus is like an adrenaline shot to jump-start an arrested heart; it can revive the patient, but it does nothing to cure the disease. Treating a sick economy requires structural reforms, which can cover everything from financial and labor markets to tax systems, fertility patterns, and education policies.

Policymakers have utterly failed to pursue such reforms, despite promising to do so. Instead, they have remained preoccupied with politics. From Italy to Germany, forming and sustaining governments now seems to take more time than actual governing. And Greece, for example, has relied on money from international creditors to keep its head (barely) above water, rather than genuinely reforming its pension system or improving its business environment.

The lack of structural reform has meant that the unprecedented excess liquidity that central banks injected into their economies was not allocated to its most efficient uses. Instead, it raised global asset prices to levels even higher than those prevailing before 2008.

In the United States, housing prices are now 8% higher than they were at the peak of the property bubble in 2006, according to the property website Zillow. The price-to-earnings (CAPE) ratio, which measures whether stock-market prices are within a reasonable range, is now higher than it was both in 2008 and at the start of the Great Depression in 1929.

As monetary tightening reveals the vulnerabilities in the real economy, the collapse of asset-price bubbles will trigger another economic crisis – one that could be even more severe than the last, because we have built up a tolerance to our strongest macroeconomic medications. A decade of regular adrenaline shots, in the form of ultra-low interest rates and unconventional monetary policies, has severely depleted their power to stabilize and stimulate the economy.

If history is any guide, the consequences of this mistake could extend far beyond the economy. According to Harvard’s Benjamin Friedman, prolonged periods of economic distress have been characterized also by public antipathy toward minority groups or foreign countries – attitudes that can help to fuel unrest, terrorism, or even war.

For example, during the Great Depression, US President Herbert Hoover signed the 1930 Smoot-Hawley Tariff Act, intended to protect American workers and farmers from foreign competition. In the subsequent five years, global trade shrank by two-thirds. Within a decade, World War II had begun.

To be sure, WWII, like World War I, was caused by a multitude of factors; there is no standard path to war. But there is reason to believe that high levels of inequality can play a significant role in stoking conflict.

According to research by the economist Thomas Piketty, a spike in income inequality is often followed by a great crisis. Income inequality then declines for a while, before rising again, until a new peak – and a new disaster. Though causality has yet to be proven, given the limited number of data points, this correlation should not be taken lightly, especially with wealth and income inequality at historically high levels.

This is all the more worrying in view of the numerous other factors stoking social unrest and diplomatic tension, including technological disruption, a record-breaking migration crisis, anxiety over globalization, political polarization, and rising nationalism. All are symptoms of failed policies that could turn out to be trigger points for a future crisis.

Voters have good reason to be frustrated, but the emotionally appealing populists to whom they are increasingly giving their support are offering ill-advised solutions that will only make matters worse. For example, despite the world’s unprecedented interconnectedness, multilateralism is increasingly being eschewed, as countries – most notably, Donald Trump’s US – pursue unilateral, isolationist policies. Meanwhile, proxy wars are raging in Syria and Yemen.

Against this background, we must take seriously the possibility that the next economic crisis could lead to a large-scale military confrontation. By the logic of the political scientist Samuel Huntington , considering such a scenario could help us avoid it, because it would force us to take action. In this case, the key will be for policymakers to pursue the structural reforms that they have long promised, while replacing finger-pointing and antagonism with a sensible and respectful global dialogue. The alternative may well be global conflagration.

#### Filed rate incentivizes strategic manipulation of regulatory agencies that locks in state and FERC capture – over-disclosure of ambiguous ex ante terms decks the regs CP

Rossi 10 [Jim Rossi, Harry M. Walborsky Professor and Associate Dean for Research, Florida State University College of Law . Edited by Daniel A. Farber and Anne Joseph O’Connell. “Research Handbook on Public Choice and Public Law”, Ch 13 ‘Public choice, energy regulation and deregulation’. 7/30/10. https://www.e-elgar.com/shop/usd/research-handbook-on-public-choice-and-public-law-9781847206749.html]

One of the cases that illustrates the broad scope – and potential cost – of the filed rate doctrine for the operation of deregulated energy markets involved a price squeeze claim by a municipal utility in Massachusetts against New England Power Company, alleging, among other claims, that the defendant offered the city’s affiliates preferential treatment as customers over Norwood.32 FERC had purportedly approved these terms as ‘just and reasonable’ as a part of New England Power Company’s restructuring plan, which included approval of market-based tariffs; since both tariff s were on file with the FERC, the US Court of Appeals for the First Circuit invoked the filed rate doctrine as a complete bar to the price squeeze claim. The court reasoned that, ‘[i]t is the filing of the tariffs, and not any affirmative approval or scrutiny by the agency, that triggers the filed rate doctrine’.33 Because ‘the rationale for the filed rate doctrine is to protect the exclusive authority of the agency to accept or challenge such tariff s’,34 in the view of the First Circuit, ‘this is not a case that calls out for revisiting the fi led rate doctrine or for strenuous efforts to carve out exceptions . . . ’35

Federal courts continue to vigorously endorse the filed tariff shield, keeping competitor and consumer claims almost completely out of the hands of both state regulators and federal courts (Rossi 2003). For example, the US Court of Appeals for the Ninth Circuit applied the fi led tariff doctrine to imply federal pre-emption of the California Governor’s eff ort to protect consumers against strategic manipulation of its deregulated power market.36 In the court’s view, ‘interstate power rates fi led with FERC must be given binding effect’ by state regulators, even when regulating in areas subject to state jurisdiction. Thus, the court stated with a sweeping confidence, ‘FERC-approved rates preempt conflicting regulations adopted by the states’.37

Public choice themes reveal how the filed tariff doctrine not only influences the course of litigation after a tariff has been filed with regulators; it also creates incentives that can influence the private behavior of regulated firms in interacting with regulators before litigation commences. Specifically, by encouraging strategic filing of tariffs with regulators to pre-empt litigation, the fi led rate doctrine may encourage a type of forum-shopping behavior by private fi rms in the regulatory process before actual litigation commences (Rossi 2003). Institutionally, agencies and courts have never been very effective at monitoring the process of filing rates and other tariff s as a private forum-shopping strategy. Although many question the effectiveness of rate regulation, this may have been a moderately stable state of aff airs with cost-of-service regulation, given routine regulatory proceedings that served as some safeguard for public values. However, with the introduction of competition to formerly regulated industries and other regulatory transitions, market norms are emerging to expose a gap in regulatory agency ability to deter wrongdoing by private firms. To the extent the filed tariff doctrine encourages strategic manipulation of the tariffing process to foreclose judicial enforcement, it widens this gap and may even result in more radical deregulation than either Congress or agencies intend – essential firms may be able to elect to operate in markets without any antitrust, contract and tort protections.

Political scientists and economists have begun to analyze how interest groups, including regulated firms, decide to allocate their resources between various types of regulation, congressional, agency, or judicial (de Figueiredo and de Figueiredo 2002; Rubin 2001). Since it has unique implications for the behavior of regulated firms, the filed rate doctrine is a worthy candidate for similar analysis. Since the doctrine is only available on a widespread basis if a utility has fi led its tariff with federal regulators, the doctrine creates a strong ex ante incentive for private fi rms, such as regulated utilities, to invest more heavily than otherwise in lobbying regulators to accept or approve tariffs. By engaging in such conduct ex ante, private firms can avoid the uncertainty of an ex post judicial proceeding in which courts enforce antitrust, tort, or contract law. The doctrine thus encourages a type of forum shopping, triggered primarily by private decisions to provide information in the regulatory process. If a private fi rm desires the protection of the fi led tariff shield – immunity from antitrust and state common law suits for its market behavior – it has a strong incentive to divulge information (especially ambiguous information) to regulators ex ante, in anticipation that this information will be included in published tariffs and will minimize unpredictable, ex post judicial meddling (Rossi 2003). Where there is no check on the accuracy, clarity and relevance of the information fi rms are submitting in the regulatory process with tariff fi lings, opportunities for manipulation of regulation – and in particular institutional choice – are presented.38 To the extent regulated firms engage in strategic conduct ex ante, an institutional bias in favor of regulatory agencies, and away from courts and markets, is likely to result.

In the context of asymmetric information disclosure of non-verifiable information in contractual bargaining, Eric Talley has observed a need for judicial monitoring or verifi - cation (Talley 2001, 192–3). Typically, the balance between disclosure, on the one hand, and institutional decisions to regulate, on the other is monitored by the oversight of a third party who has the ability to protect the public interest. For example, in the context of tort litigation, securities regulation, and witness immunity from criminal prosecution, each of which use information disclosure to influence regulatory choices, third party oversight plays an important role in monitoring the divulgence of information to ensure that the choice is welfare-enhancing. In the context of many price-regulated industries, however, third-party monitoring of strategic disclosure is ineffective. Third-party monitoring of information disclosure in the utility regulation would depend on the actions of either regulators, as in the context of the SEC, or courts, as in the context of criminal immunity. To the extent that the filed rate doctrine applies, however, both regulators and courts have been ineffective at policing this balance ex ante to ensure that the application of the shield is not harmful to social welfare ex post in the utility regulation context.

As regulators have moved towards restructured markets, and away from cost-of service regulation, agencies have tended to acquiesce in, rather than seriously scrutinize or refuse, tariff filings. In fact, often filed tariff s become effective by operation of law after the passage of time, with little or no scrutiny by agencies. So the filed tariff bar curiously aligns the incentives of both private fi rms and regulators to include as many terms and conditions as possible in tariff s – even when these terms and conditions are a sham, in the sense that agencies often lack the power to seriously enforce them. This is not as much of a problem with cost-of-service regulation, since tariff s are subject to potential adjudication in a hearing; with restructuring, however, tariff s are frequently accepted without such scrutiny, presenting the potential for a new kind of private manipulation of the regulatory process.39 Given the principles of deference courts have provided to regulators in the late twentieth century (Kearney and Merrill 1998, 1396; Pierce 1989, 1046; Goldsmith 1989, 243), the judiciary has played very little role in policing private behavior in the tariffing process and its relationship to the fi led tariff shield.

# 2AC

## Adv 1

## Adv 2

#### Impending unexpected energy inflation collapses growth

Fitch 3/1 [Fitch Ratings, Financial Research Company. “Inflation Challenges Increase the Risk of Recession”. 3/1/22. https://www.fitchratings.com/research/sovereigns/inflation-challenges-increase-risk-of-recession-01-03-2022]

Fitch Ratings-London-01 March 2022: Inflation challenges could start to threaten the global economic outlook this year, Fitch Ratings says in a new report. A scenario where US inflation remains very high in 2H22 and medium-term inflation expectations rise is plausible and could prompt much more abrupt Federal Reserve tightening than expected.

Core inflation is widely expected to fall in the US and Europe in 2H22 as consumer goods shortages moderate, pandemic constraints on labour supply fade and growth rates normalise. This should allow central banks to gradually normalise monetary policy, with limited impacts on growth. Fitch expects the Fed to raise interest rates by 100bp in 2022 and a further 100bp in 2023, the Bank of England (BOE) to hike rates by a further 75bp this year and 50bp in 2023, with the ECB increasing rates by 20bp next year.

However, recent inflation outturns have been higher than expected and the price outlook is uncertain. Inflation is a dynamic process and can be self-reinforcing. Various factors could keep core inflation high throughout 2022. Global energy price shocks related to the Russia-Ukraine crisis exacerbate risks.

If core inflation remains high and inflation expectations rise the Fed and the BOE could be left with no choice but to quickly move rates to neutral or restrictive levels. This could entail the Fed Funds rate rising to 3% by the end of this year.

A more abrupt adjustment path could take a big toll on GDP including through tighter credit conditions and a sharp rise in long-term US bond yields. US GDP growth could fall to 0.5% or below in 2023 in such a scenario, compared with Fitch’s baseline forecast of 1.9%.

The risk of a more abrupt policy adjustment from the ECB is lower, but if eurozone inflation were to remain high quantitative easing could be wound up and interest rates increased this year.

# OFF

## T – Core

### 2AC T

#### Core is a basic part.

Merriam-Webster ND, Publishing Company, “core noun (1), often attributive,” https://www.merriam-webster.com/dictionary/core

2a: a basic, essential, or enduring part (as of an individual, a class, or an entity)

#### Subsets are topical

FTC ND [FTC, https://www.ftc.gov/tips-advice/competition-guidance/guide-antitrust-laws/antitrust-laws]

Here is an overview of the three core federal antitrust laws.

The Sherman Act outlaws "every contract, combination, or conspiracy in restraint of trade," and any "monopolization, attempted monopolization, or conspiracy or combination to monopolize." Long ago, the Supreme Court decided that the Sherman Act does not prohibit every restraint of trade, only those that are unreasonable. For instance, in some sense, an agreement between two individuals to form a partnership restrains trade, but may not do so unreasonably, and thus may be lawful under the antitrust laws. On the other hand, certain acts are considered so harmful to competition that they are almost always illegal. These include plain arrangements among competing individuals or businesses to fix prices, divide markets, or rig bids. These acts are "per se" violations of the Sherman Act; in other words, no defense or justification is allowed.

The penalties for violating the Sherman Act can be severe. Although most enforcement actions are civil, the Sherman Act is also a criminal law, and individuals and businesses that violate it may be prosecuted by the Department of Justice. Criminal prosecutions are typically limited to intentional and clear violations such as when competitors fix prices or rig bids. The Sherman Act imposes criminal penalties of up to $100 million for a corporation and $1 million for an individual, along with up to 10 years in prison. Under federal law, the maximum fine may be increased to twice the amount the conspirators gained from the illegal acts or twice the money lost by the victims of the crime, if either of those amounts is over $100 million.

The Federal Trade Commission Act bans "unfair methods of competition" and "unfair or deceptive acts or practices." The Supreme Court has said that all violations of the Sherman Act also violate the FTC Act. Thus, although the FTC does not technically enforce the Sherman Act, it can bring cases under the FTC Act against the same kinds of activities that violate the Sherman Act. The FTC Act also reaches other practices that harm competition, but that may not fit neatly into categories of conduct formally prohibited by the Sherman Act. Only the FTC brings cases under the FTC Act.

The Clayton Act addresses specific practices that the Sherman Act does not clearly prohibit, such as mergers and interlocking directorates (that is, the same person making business decisions for competing companies). Section 7 of the Clayton Act prohibits mergers and acquisitions where the effect "may be substantially to lessen competition, or to tend to create a monopoly." As amended by the Robinson-Patman Act of 1936, the Clayton Act also bans certain discriminatory prices, services, and allowances in dealings between merchants. The Clayton Act was amended again in 1976 by the Hart-Scott-Rodino Antitrust Improvements Act to require companies planning large mergers or acquisitions to notify the government of their plans in advance. The Clayton Act also authorizes private parties to sue for triple damages when they have been harmed by conduct that violates either the Sherman or Clayton Act and to obtain a court order prohibiting the anticompetitive practice in the future.

#### ‘Core’ is not a term of art. It means essential.

Crawford ’89 [James D, James J Leyden, Frank C Sabatino, and Jack G Mancuso; October; J.D. at the University of Pennsylvania; J.D. at the University of Pennsylvania; J.D. at Notre Dame; J.D. at Pennsylvania State University; Westlaw, Brief on Writ of Certiorari to the United States Court of Appeals for the Third Circuit, “Fmc Corporation, Petitioner, v. Cynthia Ann Holliday, Respondent.,” No. 89-1048, WL 1128234]

The Third Circuit's decision springs from the conclusion that the deemer clause only shields “core” ERISA concerns. Perhaps the most vivid defect in this fallacy is the fact that the Third Circuit had to invent the term “core,” which is not used in ERISA, has no textual basis \*24 in the relevant legislative history, and does not even have an apparent definition in this context. Yet whatever “core” may mean, the Third Circuit certainly intended it to involve matters of critical importance. Any other definition would do violence to the English language.43 Judged by this standard, Pennsylvania's constraints upon subrogation clearly impair “core” ERISA concerns, arising from fiduciary obligations at the heart of the statute.’

Footnote 43.

The definitions of the adjective “core” are: “a: a basic, essential, or enduring part (as of an individual, a class, or an entity) b: the essential meaning: GIST ... c: the inmost or most intimate part.” Webster's New Collegiate Dictionary, 250 (1973).

## T — Private Sector

### 2AC – T Private Sector - Short

#### Counter-interpretation---the private sector includes an industry.

The Law Dictionary N.D., (The Law Dictionary: Featuring Black's Law Dictionary Free Online Legal Dictionary 2nd Ed. “Private Sector” , <https://thelawdictionary.org/private-sector/> , date accessed 9/11/21)

What is PRIVATE SECTOR?

An industry that is composed of private companies. The corporate sector and the personal sector are encompassed in the private sector and they are responsible for the allocation of the majority of resources within the economy.

#### The includes particulars

Random House 6 (Unabridged Dictionary, <http://dictionary.reference.com/browse/the>)

(used, esp. before a noun, with a specifying or particularizing effect, as opposed to the indefinite or generalizing force of the indefinite article *a* or *an*): the book you gave me; Come into the house

## Regs CP

### 2AC – Treble

#### Antitrust is the only way to maximize competition which is key to our impacts – hamfisted regulation without expertise fails

Ennis 10 [Dr. Sean, Affiliated Academic in NERA's Global Antitrust and Competition Practice, Professor of Competition Policy and Director of the Centre for Competition Policy at the University of East Anglia. “ELECTRICITY: RENEWABLES AND SMART GRIDS”. 2/15/10. https://www.ftc.gov/system/files/attachments/us-submissions-oecd-2010-present-other-international-competition-fora/smartgrids\_usa.pdf]

Competition agencies may have a similarly important role to play in the competition advocacy arena. In particular, in designing effective regulatory polices with respect to smart meters and demand response, there are a number of specific kinds of possible behavior to which regulators and antitrust enforcers should be sensitive. Incumbents may have much to lose from efficient demand response, and they may try to use regulatory actions to limit deployment of smart meters and residential-scale demand response by, for example:

• Resisting deployment of smart meter technology;

• Supporting deployment of less sophisticated, proprietary, or closed architecture equipment so that access to information is difficult and expensive;

• Supporting imposition of utility-type regulation on new entrants to raise their costs and discourage entry; and

• Supporting strict and inflexible interconnection criteria for variable resources, like rooftop solar.

23. Similarly, regulators and antitrust enforcers should be sensitive to the following types of behavior with respect to infrastructure modernization:

• Refusing to update grids, even when it makes economic sense to do so, in order to foreclose entry by renewable generation sources;

• Attempting to convince regulatory bodies to force inordinate costs for connection and modernization onto new entrants, including renewable generation; and

• Other attempts to raise costly barriers to entry for new generation (or limit it entirely), including attempts to foreclose renewable resources from capacity markets and attempts to impose excessive charges for backup power on customers with distributed generation.

24. To be sure, not every one of these types of actions is necessarily harmful to competition, unwarranted, or unjustified. There are undoubtedly substantial costs involved in the coming technological transition and incumbent firms may have legitimate concerns about whether the benefits of a transition to a new generation of technology outweigh the costs of that transition, particularly when environmental and other social costs have not fully been internalized in price. This question makes it all the more important for regulators to be able to carefully and intelligently evaluate the incentives of firms and consider the claims of those who comment on their proposals. Antitrust agencies may be particularly well-equipped to assist in this endeavor. Given their institutional expertise, antitrust enforcers can help highlight for regulators the positive dynamic effects of increased competition in the face of competing arguments about its ultimate economic impact.

### 2AC – FERC CP – Top

#### Filed rate prohibits the CP – it remains limited to prospective rate setting

Spence 12 [David B. Spence, Rex G. Baker Centennial Chair in Natural Resources Law at the University of Texas School of Law, and Professor of Business Government & Society. Robert Prentice, Professor and Department Chair, Business, Government and Society, McCombs School of Business, UT Austin. The Transformation of American Energy Markets and the Problem of Market Power.” 1/1/12. https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3184&context=bclr]

The California crisis revealed that while FERC had anticipated some of the forms of unfair competition that emerged after restructuring (such as discrimination by owners of gas and electric transmission lines in favor of their affiliates), it apparently had not foreseen some of the ways in which sellers on competitive wholesale markets were able to capture and abuse market power, or to influence prices in the spot and derivatives markets. Exercising its continuing responsibility to regulate competition and ensure that wholesale rates (including market-based rates) were “just and reasonable,”149 the agency’s initial response to the crisis focused on preventing and deterring wholesale sellers from acquiring and abusing market power. FERC’s previous grants of authority to charge market prices for energy had always been conditioned on the sellers’ lack of market power; however, long-standing precedent under both the FPA and the NGA—the so-called “filed rate doctrine”150— prohibited FERC from retroactively penalizing sellers who charged market rates that had been “filed” with FERC.151 In the wake of the California crisis, courts affirmed the agency’s conclusion that the market rates charged by FERC-authorized sellers in the California spot markets were “filed rates” for purposes of the filed rate doctrine.152 Therefore, in the event a seller authorized to charge market-based rates acquires market power—the power to capture scarcity rents by influencing price—the only remedy available to FERC at the time was to revoke that seller’s authority to charge market-based rates prospectively. FERC can do this in either of two ways: (1) by reimposing cost-based rates for that seller, or (2) by imposing rate caps for that seller in the relevant market (what it calls “mitigation”).

#### FERC and state regulators are captured – guts the CP – latest evidence

Agarwal 21 [Aakshi, HARVEY M. APPLEBAUM ’59 AWARD Winning Paper in the Yale University Digital Platform for Scholarly Publishing, B.S. Yale University, Advisor: Professor Michael Fotos. “Regulatory Agency Capture: How the Federal Energy Regulatory Commission Approved the Mountain Valley Pipeline.” 4/30/21. https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=1083&context=applebaum\_award]

To illustrate, agencies are prime targets for capture by the industries they regulate. The agencies the FERC works with, like the USACE and BLM, were criticized for their permitting errors and inadequate analyses by the courts, which could suggest they have already been captured. Like these agencies, the state agencies that the FERC works with such as the West Virginia Department of Environmental Protection and Virginia Department of Environmental Quality can become captured by pro-industry ideology from the industry. These state agencies are also uniquely vulnerable to “electorally sanctioned pro-business governance,” because the revenues and jobs from big projects can cause elected state and local officials to persuade regulatory decision makers.251

Furthermore, the FERC’s agenda can stem from Congress or the Executive. The FERC is intended to be an independent agency, but the FERC derives its power and funding from Congress and an agenda from the Executive. For example, the Trump administration was reported to pressure agencies with its pro-energy stance on the Atlantic Coast Pipeline.252 John Schmidt, a former regulator with the USFWS, also described that the Trump administration did not operate like previous administrations.253 Likewise, Congress, the Executive, and the bureaucracy are also influenced by public opinion. If the public opinion in any constituency supports pipelines, the FERC can conduct “electorally sanctioned pro-business governance” where it favors the industry because the constituency desires that.25

Furthermore, Carpenter & Moss’ gold-standard for diagnosing capture emphasizes how a solid capture diagnosis must “Show action and intent by the industry (special interest) in pursuit of this policy shift sufficiently effective to have plausibly caused an appreciable part of the shift.”255 Though this study points to areas where the MVP appears to have influenced the FERC, the unwritten conversations between the MVP and the FERC are not revealed. However, a study of capture rarely finds a “eureka” piece of evidence such as a link between the regulator and the industry that can prove capture. Further analysis via FOIA requests may indicate more evidence of capture in the future to better meet this standard set by Carpenter & Moss.

Additionally, this study’s findings are confounded by the FERC’s own procedural errors and institutional justice concerns. Several parts of this study find errors in the FERC’s process such as tolling orders, which suggest capture due to how these errors favor the industry. However, it is also possible that the FERC conducts a poor public participation process on its own. For example, an investigation by the Office of the Inspector General on the FERC revealed the FERC did not post Notices of Schedule for Environmental Review for 9 years, including a period where the MVP was considered.256 During interviews, several participants raised similar concerns. A journalist brought up that several people they met did not have internet access and missed big updates that otherwise were not on the front of the news.257 Walker from the Sierra Club also explained that in her experience at the Sierra Club, “Of all agencies, FERC is the absolute worst in terms of public participation.”

Lastly, this study’s findings may not be representative of the FERC’s actions on other pipeline cases. The MVP and ACP are unique cases due to the level of pushback and how the opposition succeeded. 259 The level of permitting errors is unprecedented to this research’s knowledge and as Chairman Glick’s office confirmed, no one opposed pipelines like this before.260 Although the MVP may not entirely represent the FERC’s experiences with pipelines, it is an indication of how pipeline permitting may go with the new pipelines intended in Appalachia.

Though there are other explanations for the FERC’s pattern of decision-making and confounding variables are present in the study, this paper nevertheless posits the FERC is culturally and corrosively captured. The FERC’s nearly universal record of decision-making against the public interest is difficult to explain via other means, and there are numerous instances where the FERC should have been making decisions insulated from congressional or Executive influence but still chose to favor the MVP. Therefore, the evidence at hand points to weak cultural and corrosive capture and further studies will be needed to verify these claims.

#### FERC gets circumvented

Peskoe 21 [Ari, Director of the Electricity Law Initiative at Harvard Law School. “IS THE UTILITY TRANSMISSION SYNDICATE FOREVER?”. 5/5/21. https://www.eba-net.org/assets/1/6/5\_-\_%5BPeskoe%5D%5B1-66%5D.pdf]

With states and Congress seemingly unwilling to oppose IOU dominance, FERC appears most likely to take further action. Yet, I acknowledge that IOUs will inevitably (and rationally) resist further FERC reforms designed to chip away at their transmission dominance. Efforts to dismantle the IOU transmission development “cartels”414 may be delayed through litigation and weakened through implementation. Recognizing the inevitability of IOU backlash, FERC might instead choose to rescind its competitive mandate and direct its reforms towards substantive outcomes, such as motivating more regional investment or incentivizing deployment of new technologies. In that vein, FERC might impose certain technical analyses in the planning process that will cause IOUs and RTOs to select the “right” projects415 or establish particular goals for regional plans to achieve, such as unlocking new resources or connecting regions. Rules that directly target substantive results may have the side-benefit of addressing IOU dominance by ensuring that projects that harm a particular IOU’s parochial interests are nonetheless developed, provided they meet FERC’s technical standards.

## FERC Waivers CP

### 2AC – FERC Waivers

#### ‘Expand’ extends.

Murphy ’47 [Loren E; September 18; Chief Justice on the Supreme Court of Illinois; Westlaw, “Fed. Elec. Co. v. Zoning Bd. of Appeals of Vill. of Mt. Prospect,” 398 Ill. 142]

The question is squarely presented as to whether the placing of the neon signs on the towers expanded the use to which the property had been previously devoted. The restrictive part of the ordinance which prohibits expansion refers to the nonconforming \*\*362 use of the property. Literally, it provides that the use may be continued but it cannot be \*146 expanded. Webster's International Unabridged Dictionary defines the word ‘expand,’ to extend, to enlarge. The application of such definition to the word ‘expanded’ as contained in section 10 would mean that the use that was being conducted on the premises at the time of the adoption of the ordinance could not be extended or enlarged. The placing of the neon signs on the towers did not expand or enlarge the use to which the property was devoted. It may have been installed for advertising purposes, hoping that it would result in a gain of its business, but there is nothing in the record which indicates that such advertising would be followed by any expansion or enlargement of the laboratory experiments that were being conducted on the property. Zenith had the right to continue its nonconforming use and the right to advertise that use and the products it was handling, so long as it did not expand the use to which the property was devoted when the ordinance was adopted.

#### ‘Scope’ means the law’s breadth.

Parsons ’14 [Honorable Donald F Jr; February 18; Vice Chancellor of the Court of Chancery of Delaware; Westlaw, “Vichi v. Koninklijke Philips Electronics, N.V.,” 85 A.3d 725]

As an initial matter, I reject the proposition that the determination of who can invoke a choice of law provision must precede the analysis of the provision's validity and scope. The “scope” of a choice of law provision refers to how broadly or narrowly that provision applies and includes the question of whether the provision created enforceable rights in third parties.310 The only case Philips N.V. cites in support of its assertion that Delaware law should govern whether it can invoke the choice of law clause merely stands for the proposition that a Delaware court will apply its own conflict of laws rules to determine which jurisdiction's substantive law will govern the claims before it.311 As noted previously, under Delaware conflict of laws rules, the scope of a valid choice of law provision is determined by the law of the selected jurisdiction—in this case, England.

#### Gets struck down

Morenoff 20 [David, Acting General Counsel @ FERC, Robert H. Solomon, Solicitor, Beth G. Pacella, Deputy Solicitor. “BRIEF OF RESPONDENT FEDERAL ENERGY REGULATORY COMMISSION in Oklahoma Gas vs FERC.” 9/25/20. https://www.ferc.gov/sites/default/files/2020-09/20-1062-Oklahoma.pdf]

This Court has explained that the “prohibition against retroactively charging rates that differ from those that were on file during the relevant time period yields in only two limited circumstances: (i) when a court invalidates the set rate as unlawful; and (ii) when the filed rate takes the form not of a number but of a formula that varies as the incorporated factors change over time.” Old Dominion, 892 F.3d at 1227 (citing West Deptford Energy, LLC v. FERC, 766 F.3d 10, 22-23 (D.C. Cir. 2014)). “The filed rate doctrine and the rule against retroactive ratemaking leave the Commission no discretion to waive the operation of a filed rate or to retroactively change or adjust a rate for good cause or for any other equitable considerations.” Id. at 1230.

#### State action is key for DERS – they will forum shop to use state action protections – Rossi and

Howard M. Crystal & Anchun Jean Su 18, Center for Biological Diversity, “Brief of Center for Biological Diversity, Food & Water Watch, Friends of the Earth, Greenpeace, Inc., Institute for Local Self-Reliance, and NC Warn, Inc. as Amici Curiae in Support of Respondent,” Salt River Project Agricultural Improvement and Power District, Petitioner, v. Tesla Energy Operations, Inc., fka Solarcity Corporation, Respondent, 2018 WL 993878, WestLaw

II. THE FOUNDATIONAL PREMISES OF SRP'S ASSERTED RIGHT TO AN UNBOUNDED MONOPOLY DO NOT HOLD IN THE AGE OF DISTRIBUTED SOLAR COMPETITION

SRP asserts that the state-action defense protects “the need to ensure that government policymakers exercise their discretion efficiently and freely, i.e., with the objective of advancing the public interest rather than of avoiding litigation.” Pet. Br. at 35 (emphasis added). Similarly, APPA claims that the state-action defense “protects public power utilities' ability to meet their public goals” and thereby “allows states to favor public objectives over free-market competition.” APPA Br. at 2, 4 (emphasis added). However, SRP and other public power companies are not advancing public \*17 objectives or the public interest when they improperly target distributed solar generation.

Stilling solar energy competition through discriminatory rates - a widespread action perpetuated by SRP and numerous other power companies - harms the public interest by obstructing the tremendous benefits that distributed solar generation brings to both consumers and the environment. Such discriminatory behavior therefore contravenes the underlying purpose of the regulated monopoly, which was to protect consumers and the public interest. The state-action defense, and interlocutory appeal of adverse state-action defense rulings, should not be available as a legal bulwark for power companies like SRP to exercise unbounded monopoly power that works against the public interest in this anti-competitive manner.

A. The Premise That Electricity Monopolies Necessarily Serve The Public Interest Has Been Undermined By Public Policy And Technology

“Until relatively recently, most state energy markets were vertically integrated monopolies - i.e., one entity … controlled electricity generation, transmission, and sale to retail consumers.” Hughes v. Talen Energy Mktg, LLC, 136 S. Ct. 1288, 1292 (2016). In the electricity industry's infancy of the early 1900s, the vertically integrated regulated monopoly made sense in light of the available technology and existent business structures of the time. Originally a natural \*18 monopoly, the electricity sector faced extreme barriers to entry, whereby construction of power plants and grid infrastructure required massive capital investments, as well as substantial economies of scale, whereby the average cost of delivered power became cheaper with new expansion in demand. Paul Garfield & Wallace Lovejoy, Public Utility Economics 15-19 (1964).

The foundational premise for granting vertically integrated utilities monopoly power was to ultimately serve the public interest.6 The electricity monopoly model sought to achieve widespread access to electricity as a public good while, at the same time, subjecting utilities to electricity rate regulation in order to prevent price gouging for ultimate consumer benefit. W.M. Warwick, U.S. Department of Energy, A Primer on Electric Utilities, Deregulation, and Restructuring of U.S. Electricity Markets 2.0 (2002), available \*19 at https://www.pnnl.gov/main/publications/external/technical\_reports/PNNL-13906.pdf; see also Smyth v. Ames, 169 U.S. 466, 544-45 (1898) (public utility monopolies were “created for [] public purposes [and] perform[] a function of the state,” and the government is obligated to “protect the people against unreasonable charges for services rendered by” the public utility).

However, the century-old premise that vertically integrated monopolies necessarily serve the public interest has been undermined by public policy and technology. In terms of policy, electricity regulators have actively encouraged competition in electricity generation in order to serve the public interest. For example, as the Court noted in FERC v. Electric Power Supply Ass'n, 136 S. Ct. 760 (2016), the Federal Energy Regulatory Commission (“FERC”) “often forgoes the cost-based rate-setting traditionally used to prevent monopolistic pricing […] [and] instead undertakes to ensure ‘just and reasonable’ wholesale rates by enhancing competition - attempting … ‘to break down regulatory and economic barriers that hinder a free market in wholesale electricity’ ” Id. at 768 (emphasis added) (quoting Morgan Stanley Capital Group Inc. v. Public Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527 (2008)).

Indeed, Congress passed a series of modern laws intended to promote competition in the electricity sector and unbundle the services of the traditional vertically integrated monopoly, all as a means to advance the public interest. Thus, due to “[t]echnological advances [that] made it possible to generate electricity \*20 efficiently in different ways and in smaller plants” and through grids that were “unlike the local power networks of the past,” New York v. FERC, 535 U.S. 1, 7 (2002), Congress passed both (i) the 1978 Public Utility Regulatory Policies Act, Pub. L. No. 95-617, 92 Stat. 3117, which directed FERC to promulgate rules requiring monopoly utilities to purchase electricity from independent power production facilities, and (ii) the Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776, authorizing FERC to order individual monopoly utilities to provide transmission services to unaffiliated wholesale generators. See New York, 535 U.S. at 9. In short, the assumption that the vertically integrated utility monopoly automatically serves the public interest has been undermined by public policy promoting competition in electricity services.

Distributed solar technology further subverts the economic and public interest assumptions justifying the traditional vertically integrated electricity monopoly. Distributed solar technology, with a relatively low barrier of entry, is de-centralized and can be owned or leased by consumers who are otherwise captive to the local utility monopoly. Ari Peskoe, Unjust, Unreasonable, and Unduly Discriminatory: Electric Utility Rates and the Campaign Against Rooftop Solar, 11 Tex. J. Oil Gas & Energy L. 211, 215 (2016). Distributed solar generation thus dispels the assumption that electricity service necessarily requires large economies of scale. John Farrell, Inst, for Local Self-Reliance, Is Bigger Best in Renewable Energy? 2-4 (2016), available at \*21 https://ilsr.org/wp-content/uploads/2016/12/Is-BiggerBest-in-Renewable-Energy-Report-Final.pdf. As such, distributed solar generation also fundamentally ruptures the business model of the vertically integrated monopoly, obviating the need for power companies like SRP to continuously construct infrastructure as their engine of profit generation. Peskoe, 11 Tex. J. Oil Gas & Energy L. at 228-32.

Taken together, these changes in public policy and technology, particularly distributed solar generation, undermine the assumption that electricity companies require deference to their monopoly power in order to serve the public interest.

B. Monopoly Power Companies Opposing Distributed Solar Generation Are Acting Against The Public Interest

1. Discriminatory rates against rooftop solar are widespread

Across the United States, both public and private electric utility companies have responded to competition from distributed solar generation with a range of discriminatory tactics, chief among them being the imposition of retail rate structures that serve to reduce solar power's cost advantage over grid-supplied energy. See Michael Wara, Competition at the Grid Edge: Innovation and Antitrust Law in the Electricity Sector, 25 N.Y.U. Envtl. L.J. 176, 189 (2017). In the last few years alone, these types of rate cases seeking to penalize rooftop solar customers have amounted to hundreds \*22 and have occurred in the majority of U.S. states. Id. at 194-99; see also N.C. Clean Energy Tech. Ctr., The 50 States of Solar Report: Q4 2017 and 2017 Annual Report (2018), available at https://nccleantech.ncsu.edu/wp-content/uploads/Q4-17\_SolarExecSummary\_Final.pdf (documenting over 100 policy actions negatively targeting distributed generation customers in over 35 states in 2017 alone).7

Power utilities have imposed discriminatory retail rate structures on distributed solar customers in several forms. First, utilities have implemented either new or increased fixed monthly bill charges that are discriminatorily high for customers with distributed solar generation, known as a “fixed charge.” For example, Santee Cooper, a state-owned public power utility \*23 in South Carolina, imposed a fixed charge of $4.40/kW as well as further stand-by charges on distributed solar customers, regardless of the amount of energy used by the customer. See Santee Cooper, Distributed Generation Rider DG-17 (2015), available at https://www.santeecooper.com/pdfs/rates/ratesadjustment/dg-17-rider.pdf; see also, e.g., Bd. of Dir. of Sacramento Mun. Util. Dis., Resolution No. 15-07-06 (Sacramento Mun. Util. Dist. July 16, 2015) (imposing higher fixed charges and time-of-use rates on solar customers); Kan. City Power & Light, Docket No. 15-WSEE-115-RTS (Mo. Corp. Comm'n Sep. 24, 2015) (Order Approving Stipulation and Agreement) (approving a 21% increase of fixed charges on distributed energy customers); Conn. Light & Power, Docket No. 14-05-06 (Conn. Pub. Util. Regulatory Authority Dec. 17, 2014) (Order Amending Rate Schedules) (also imposing a 20% increase of fixed charges on distributed energy customers).

Second, utility companies have imposed electricity charges on solar customers that vary as a function of the consumer's peak demand for energy, known as a “demand charge.” See, e.g., NSTAR Elec. Co., D.P.U. 17-05-B (Mass. Dept. of Pub. Util. Jan. 5, 2018) (Order Establishing Eversource's Rate Structure) (approving mandatory demand charges specifically on residential distributed solar customers).

SRP's new rate structure exemplifies both of these discriminatory rate practices, as SRP imposed both a fixed distribution charge of up to $37.88 per month and increased demand charges ranging from $30 to $125 \*24 per month for all residential distributed solar customers. J.A. 33 (¶ 108). These rate changes resulted in an increase of approximately 65% in energy fees (or $600 per year) for a typical solar customer, as opposed to a 3.9% increase in energy fees for a non-solar customer. See J.A. 8-9 (¶ 5); see also, e.g., Wis. Electric Power Co., Docket No. 5-UR-107 (Wis. Public Service Comm'n Dec. 23, 2014) (Final Decision) (approving application to impose high demand charges, fixed charges, and time-of-use rates on distributed solar customers).

2. Discriminatory rates against rooftop solar harm consumers and the environment

Wide-scale discriminatory rates targeting solar power deployment undermine the very public objectives that power utility monopolies were created to serve because they harm both consumers and the environment.

First, rates that stifle the deployment of rooftop solar harm consumers by diminishing the economic and social value they receive through generating their own power. Due to technological advances, the cost of residential solar has dropped precipitously and is cost-comparable, if not lower, than the average price of power purchased from the utility grid. See, e.g., Gideon Weissman & Brett Fanshaw, Shining Rewards: The Value of Rooftop Solar Power for Consumers and Society (2016), available at https://environmentamerica.org/sites/environment/files/reports/AME%20ShiningRewards%C20Rpt%C20Oct16%201.1.pdf; Mark Muro & Devashree \*25 Saha, Rooftop Solar: Net Metering is a Net Benefit, Brookings Institution (May 23, 2016), available at https://www.brookings.edu/research/rooftop-solar-net-metering-is-a-net-benefit/. Further, distributed solar generation can serve to democratize power ownership by increasing local control over power decisions, returning economic benefits directly to the served community and promoting a more equitable distribution of economic and social benefits across racial and economic lines. See generally Local Clean Energy All. & Center for Social Inclusion, Democratizing Our Energy Future (2015), available at http://www.localcleanenergy.org/files/Climate%20Justice%C20Energy%20Platform.pdf.

Second, discriminatory rates inhibiting distributed solar generation stave off the public health benefits associated with phasing out fossil fuel combustion from power plants. Nearly 40% of Americans are exposed to toxic air pollution from fossil fuel power plants that often reaches dangerous levels, resulting in the increased incidence of asthma and chronic bronchitis and leading to hundreds of thousands of premature deaths per year. See Am. Lung Ass'n, State of the Air 9 (2017), available at http://www.lung.org/assets/documents/healthy-air/state-of-the-air/state-of-the-air-2017.pdf. Critically, these public health impacts are disproportionately borne by communities of color and low-income, who more often live in closer proximity to fossil fuel power plants. Id. at 41; see also National Ass'n for the Advancement of Colored People & Clean Air Task Force, Fumes Across the Fence-Line: The Health Impacts of Air Pollution from Oil and Gas Facilities \*26 (2017), available at http://www.naacp.org/wp-content/uploads/2017/11/Fumes-Across-the-Fence-Line\_NAACP\_CATF.pdf. Accordingly, obstructing distributed solar generation directly exacerbates the country's systemic public health disparities by perpetuating reliance on fossil fuel power.

Finally, these discriminatory rates hinder the country's urgently needed transition to clean energy in order to combat climate change. More than 60% of America's electricity still derives from fossil fuels. U.S. Energy Info. Admin., Electricity Explained (May 10, 2017), available at https://www.eia.gov/energyexplained/index.cfm?page=electricity\_in\_the\_united\_states. As a result, the electricity sector is the single largest source of GHG emissions in the country, accounting for nearly one-third of total U.S. GHG emissions in 2015. U.S. Envtl. Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015 ES-24 (2017), available at https://www.epa.gov/sites/production/files/2017-02/documents/2017\_executive\_summary.pdf.

Accordingly, discriminatory ratemaking against the deployment of distributed solar energy, like that implemented by SRP, undermines the inherent public interest in “aggressive and sustained greenhouse gas emission reductions” in order to avoid some of the worst impacts of climate change. Jerry Melillo et al., U.S. Global Change Research Program, Climate Change Impacts in the United States: The Third National Climate Assessment 13 (2014), available at http://s3.amazonaws.com/nca2014/low/NCA3\_Climate\_Change\_Impacts\_in\_the\_United%20States\_LowRes.pdf?download \*27 =1 (“2014 Climate Assessment”). Indeed, the public harms caused by climate change are immense: the increased extinction of species and ocean acidification; the rapid loss of Arctic sea ice and the collapse of Antarctic ice shelves; declining global food and water security; and the heightened frequency of heat waves and other extreme weather events, including contribution to the three unprecedented hurricanes that ravaged the Gulf Coast, Florida, and Puerto Rico in 2017. See generally 2014 Climate Assessment; see also Michael Mann et al., What We Know About the Climate Change-Hurricane Connection, Scientific American (Sept. 8, 2017), available at https://blogs.scientificamerican.com/observations/what-we-know-about-the-climate-change-hurricane-connection/.

For all these reasons, it could not be clearer that by obstructing the realization of these consumer and environmental benefits, utility rates which improperly discourage the transition to renewable energy sources like rooftop solar are contrary to the public interest.

C. Allowing Public Power Companies To Obtain Interlocutory Appeal Of State-Action Immunity Rulings Will Only Encourage More Discriminatory Rates Contrary To The Public Interest

The central premise of SRP's asserted right to interlocutory appeal is that it is necessary to allow public power entities to focus their attention on “advancing the public interest” without potential exposure to \*28 antitrust liability. Pet. Br. at 35. However, because SRP and other utilities' decisions targeting distributed solar generation are arguably contrary to the public interest, SRP raises no “particular value of a high order” warranting immediate appeal under the collateral-order doctrine. Mohawk Indus., Inc. v. Carpenter, 558 U.S. 100, 605 (2009).

Instead, allowing interlocutory appeal in these circumstances will serve to further encourage power companies to unfairly obstruct distributed solar development in a manner contrary to antitrust laws, with the expectation that they can avoid liability by invoking the state-action defense and, at minimum, significantly delay antitrust litigation by immediately appealing adverse rulings. By requiring SRP to defend its rates - including its purported entitlement to the state-action defense - like any other litigant, the Court will level the playing field in an area where it has become increasingly apparent that competition, rather than the perpetuation of insulated monopoly power, will best serve the public interest.

Such a result would also be consistent with this Court's precedents recognizing that power companies are not immune from competition and antitrust laws. In Otter Tail Power Co. v. United States, 410 U.S. 366 (1973), the Court decisively held that the Federal Power Act does not “immunize” power companies from “antitrust regulation.” Id. at 374-75 (permitting the federal government to seek antitrust remedies against a power utility which, among other things, refused to sell power to municipalities and transfer competitors' \*29 power over its lines). As the Court has explained, a power company's “franchise to exist as a corporation and to function as a public utility … creates no right to be free of competition.” Tenn. Electric Power Co. v. Tenn. Valley Auth., 306 U.S. 118, 139 (1939) (overruled in part on other grounds); see also Alabama Power Co. v. Ickes, 302 U.S. 464, 480 (1938) (holding that power utilities do not “possess” any inherent legal “right to be immune from lawful … competition”). These findings are grounded in the recognition that “[t]he public interest is far broader than the economic interest of a particular power supplier.” Otter Tail Power Co., 410 U.S. at 380 n.10. Accordingly, Amici urge the Court to recognize that, at least with respect to monopoly practices serving to obstruct distributed solar generation, the state-action defense and interlocutory appeal of adverse immunity rulings should be disfavored.

## Algorithmic Collusion FTC DA

### 2AC – Top

#### The FTC is stretched thin and has losses coming

McLaughlin 1/19 [David McLaughlin, Bloomberg. “FTC’s Khan Vows to Act With ‘Fierce Urgency’ on Antitrust Front.” 1/19/22. https://www.bloomberg.com/news/articles/2022-01-19/ftc-s-khan-vows-to-act-with-fierce-urgency-on-antitrust-front]

Khan said the FTC is “severely under-resourced” and the record deal-making by companies is straining the agency’s ability to review and potentially challenge transactions. That is posing “very difficult choices” about which deals to investigate, she said.

Still, the FTC can’t hold back from bringing risky cases that the agency might lose. Under Khan’s tenure, the FTC sued to block chipmaker Nvidia Corp.’s proposed $40 billion takeover of Arm Ltd. and salvaged a lawsuit that seeks to break up Meta Platforms Inc.

**No spillover between parts of the FTC**

Spencer Weber **Waller 5**, Professor of Law and Director of the Institute for Consumer Antitrust Studies at the Loyola University Chicago School of Law, “In Search of Economic Justice: Considering Competition and Consumer Protection Law”, Loyola University Chicago Law Journal, 36 Loy. U. Chi. L.J. 631, Winter 2005, Lexis

Despite this more comprehensive mission, the FTC is organized in a way that **tends to emphasize the separation of these fields,** rather than the common elements of the agency's mission. The FTC has a Bureau of Competition and a separate Bureau of Consumer Protection, with a Bureau of Economics to support the work of both endeavors. The Bureau of Competition ("BC") primarily engages in the investigation and enforcement of mergers and complex civil antitrust cases with a recent emphasis on intellectual property and health care issues. The Bureau of Consumer Protection ("BCP") primarily investigates and challenges outright fraudulent conduct. 9 The FTC website details recent BCP activity involving Internet sales, telemarketing, false health and fitness claims, identity theft and similar issues. 10 These are **all very different issues** from the day-to-day focus of the competition staff. This basic split is further mirrored in the Bureau of Economics ("BE"), where the staff tends to specialize in either competition or consumer protection. **Any crossover** of staff and cooperation **occurs primarily in competition advocacy** before legislatures or regulatory agencies, and not **in case selection and investigation.**

#### Focused on mergers

Tabas 3/3 [Sonia Kuester Pfaffenroth , Matthew Tabas and Kevin Chen, Arnold & Palmer, "United States: FTC Hospital Merger Challenge Signals Future Labor Market Enforcement Actions", 3/3/22, https://www.mondaq.com/unitedstates/antitrust-eu-competition-/1167736/ftc-hospital-merger-challenge-signals-future-labor-market-enforcement-actions]

On February 17, 2022, the US Federal Trade Commission (FTC) unanimously authorized an administrative complaint and a lawsuit in US District Court for the District of Rhode Island to block the proposed merger of Lifespan Corporation (Lifespan) and Care New England. The FTC's complaint asserts that the transaction would combine two of Rhode Island's largest healthcare providers and allegedly would lead to higher prices and a lower quality of care for patients in violation of Section 7 of the Clayton Act.1

The FTC's challenge to a transaction that, according to the agency, would result in one entity controlling "at least 70 percent of the Rhode Island market for inpatient general acute care hospital services and at least 70 percent of the market for inpatient behavioral health services"2 represents a traditional Section 7 theory in a hospital merger case, albeit with the FTC alleging a transaction harmed competition in the "inpatient behavioral health services" market for the first time. In this case, however, the two Democratic Commissioners also would have brought a Section 7 claim based on a substantial lessening of competition in a relevant labor market. That claim was not supported by the two Republicans on the Commission, and thus was not included in the FTC's complaint. Nonetheless, the Democrats statement is an important reminder of the current Administration's focus on antitrust enforcement in labor markets.

#### Their algorithmic collusion impact is all hype – the threat is virtually non-existent and existing antitrust frameworks can easily cope

Dr. Thibault Schrepel Feb 7 2020 [Assistant Professor at Utrecht University School of Law, Faculty Associate at Harvard University’s Berkman Klein Center for Internet & Society, Associate Researcher at University of Paris 1 Panthéon-Sorbonne and Invited Professor at Sciences Po Paris “The Fundamental Unimportance of Algorithmic Collusion for Antitrust Law” https://jolt.law.harvard.edu/digest/the-fundamental-unimportance-of-algorithmic-collusion-for-antitrust-law]

The publication of Virtual Competition[5] in 2016 was a pivotal moment that began putting emphasis on the alleged danger of algorithmic collusion. In it, antitrust and competition law is described as powerless in the face of practices organized by computers, some of which are using artificial intelligence whose impact is sometimes described as “the biggest risk that we face as a civilization.”[6] A semblance of academic consensus has formed around the need for antitrust and competition authorities to focus their efforts on this new supreme – “supreme evil,” namely, algorithmic collusion.[7] Nevertheless, algorithmic collusion is a fundamentally unimportant subject for antitrust and competition law, for at least two reasons.

A. Lack of conclusive empirical studies

Algorithmic collusion is the subject of a growing literature, yet, empirical studies documenting the frequency of the phenomenon in the real-world remain to be produced. One cannot find any quantification of algorithmic collusion in official publications coming from antitrust and competition agencies,[8] in any of the reports given to these agencies,[9] or in the OECD publications.[10] When having a look at the litigation brought in the U.S. and in Europe, algorithmic collusion is virtually non-existent.[11]

For that reason, the priority is to first quantify the phenomenon rather than to propose drastic changes to antitrust and competition law.[12] The academic community must play its part, but for the time being, the popularity of algorithmic collusion as a topic is a publication bias–in which this article (partially) takes part.

B. Old wine in new bottles

Even if algorithmic collusion were already, or could become, a frequent practice, it would remain old wine in new bottles. Indeed, such collusion is simply a more elegant way of implementing the same practices known for centuries. Whether they are algorithmic or not, the nature of anti-competitive collusion remains identical. In fact, algorithmic collusion is at the origin of two non-fundamental problems: detection, and liability assignment.

In terms of detecting illegal practices, algorithms could enable faster implementation of agreements between companies, potentially for only a few seconds.[13] In terms of liability assignment, one may note the difficulties that arise in situations where the algorithm, whose initial order was to maximize the company’s profits, has decided on its own to implement an anti-competitive practice.[14]

In both cases, solutions are already emerging. Part of the doctrine underlines that algorithms may be used by competition authorities to detect algorithmic collusion.[15] Robots Computer war is not far off. As for the assignment of liability, there is no doubt as to lawyers’ ability to distribute it, whether to the company that is using the algorithm, to the company that created it, to individuals or to the algorithm itself.

To sum up, algorithmic collusion is not yet quantified, and even if it was, it would not raise fundamental problems for antitrust and competition law. The law will respond to relevant issues in due course. Antitrust and competition agencies would, therefore, be well advised to focus their resources where consumer harm can already be quantified. Unfortunately, the publication bias that pushes part of the scientific community to publish on the subject of algorithmic collusion creates a headwind and leads authorities to misdirect these resources.

## Floodgates

### 2AC—Floodgates

#### Multiple alt causes—quiet enjoyment, torts, next friend suits—your ev, cal’s blue

Stern 3—(BA, JD Candidate at University of Pennsylvania Law School). Toby J. Stern. 2003. “Federal Judges and Fearing the "Floodgates Of Litigation". 6 U. Pa. J. Const. L. 377. <https://scholarship.law.upenn.edu/jcl/vol6/iss2/8/>. Accessed 11/4/21.

The earliest known case in which a court made such an argument is Whitbeck v. Cook.25 In Whitbeck, the Supreme Court of Judicature of New York considered whether a landowner could sue the grantor of land for a breach of the covenant of quiet enjoyment when the nuisance-a public road-was a permanent and obvious part of the parcel.24 In granting the defendant's demurrer, the court noted that if the plaintiff's action were allowed, "a flood-gate of litigation would be opened, and for many years to come, this kind of action would abound."2 5

The argument takes the same form in more recent cases and arises frequently in several areas of law. The first is tort suits in which the plaintiff urges the court to recognize a new cause of action or tort.2 7 The classic statement regarding torts was then-Chief Judge Cardozo's fear of the litigation that might arise from exposing defendants to "liability in an indeterminate amount for an indeterminate time to an indeterminate class." 28

Another area of law in which floodgates arguments are often found is that of "next friend" suits. A next friend is "a person who appears in a lawsuit to act for the benefit of an incompetent or minor plaintiff, but who is not a party to the lawsuit and is not appointed as a guardian., 29 Floodgates arguments abound in these suits because the question is often whether the next friend should be allowed to 30 bring the suit despite not being appointed by the court. In 1990, the Supreme Court announced in Whitmore v. Arkansas that a next friend "must have some significant relationship with the real party in interest, " but did not provide any guidance on how to determine whether a potential next friend meets that requirement.1

In Hamdi v. Rumsfeld, the Fourth Circuit Court of Appeals considered whether a public defender could file a next friend suit against the United States Government on behalf of a U.S. citizen who was being detained as an "enemy combatant" without an attorney.3 3 The court held that the public defender was not a suitable next friend because he did not have a "significant, preexisting relationship with the real party in interest."04 The court reasoned, "If we were to grant a supposed next friend access to federal court in the absence of such a relationship, we could be opening the floodgates of federal litigation to the very 'intruders or uninvited meddlers, styling themselves next friends.'"

Hamdi cites a Seventh Circuit case interpreting the Whitmore standard, in which the court held (in a decision by then-Chief Judge Posner) that a next friend seeking to represent a child must be either a parent, sibling, recognized guardian, or someone "akin to a trustee. " , 6 The court reasoned that standing doctrines in place were meant to ensure that a litigant had more than a mere ideological interest in the case-that is, that a litigant had a "concrete stake" therein. 37 The court explained that without such a limitation, "the federal courts [would] be flooded by 'cause' suits (really flooded) .

Another set of cases in which the floodgates argument recurs are those involving the enforcement of the antitrust laws under Section 4 of the Clayton Act.3 9 Floodgates arguments are particularly applicable to Section 4 cases. That statute mandates treble damages and attorneys' fees to a successful antitrust litigant,40 providing an incentive for 41 someone with a marginal claim to sue.

For example, in Calderone Enterprises Corp. v. United Artists Theatre Circuit, Inc., the Second Circuit Court of Appeals considered "the question whether one who is not a 'target' of an alleged antitrust conspiracy has standing under § 4 of the Clayton Act., 42 In answering the question in the negative, the court argued against opening the floodgates to "every creditor, stockholder, employee, subcontractor, or supplier of goods and services that might be affected."4 Specifically, the court claimed that "the lure of a treble recovery, implemented by the availability of the class suit... would result in an overkill." 44 The dissenting judge, however, held fast to his view of the relevant Supreme Court precedents, claiming that the Court "has constantly recognized that antitrust laws should be given the broadest and most liberal interpretation in order to effectuate Congressional intent."45

A similar situation arose in In re Industrial Gas Antitrust Litigation.4 In that case, the Seventh Circuit held that a fired and blacklisted gas worker was not entitled to bring a private treble damages suit against his employer under Section 4.47 The court echoed the fear expressed in Calderone (and cited the language quoted from Calderone above), claiming that "[u]nless § 4's phrase 'by reason of' is interpreted to require a direct causal link between the antitrust violation and the resulting injury, the courts would be flooded with antitrust litigation.”48

Thus the floodgates argument can appear in many types of cases, but tends to recur in those cases where a litigant seeks to establish a new right or cause of action. 49 At the appellate level, it is as likely to be found in dissenting opinions as it is in those of the majority.

#### Their link card says there would be an anti-plaintiff judicial response to legislation explicitly reversing a recent Supreme Court’s decision in Twombly – that’s not even remotely analogous to the plan – cal’s blue

Stone 10—(JD from Northwestern, former law clerk to Justice Antonin Scalia on the United States Supreme Court). Judd E. Stone & Joshua Wright. 2010. “Antitrust Formalism Is Dead! Long Live Antitrust Formalism! Some Implications of American Needle v. NFL” Cato Sup. Ct. Rev, 369–70. Accessed 11/5/21 via Westlaw.

\*\**Bell Atlantic Corp. v.* ***Twombly* was a 2007 case that held parallel action alone isn’t illegal** under the Sherman Act unless accompanied by evidence of an agreement

But what of Twombly itself? One potential response to Twombly already proposed in multiple circles is simple legislation codifying the previous pleading requirements. This action would presumably lead to a large increase in cases at the margin between, as Twombly put it, merely “conceivable” versus “plausible.”152 These cases would be by necessity among the weakest antitrust suits present, requiring the most extensive discovery in order to vindicate the least obvious consumer harms. Antitrust has seen this pattern play out before, however; it was due to the massive proliferation of private actions that inspired much of the error-cost protections not only ensconced in the consumer harm requirements of Section 2 but narrowing Section 2's scope altogether. To borrow a phrase, the cautionary tale for repealing Twombly is that opening the floodgates to all conceivable antitrust claims is a strategic maneuver that will favor plaintiffs in only the very shortest of temporal horizons--before the antitrust “system” of rules reacts accordingly.

The expectation that American Needle represents a permanent shift toward more expansive antitrust enforcement is thus misguided. The narrowing of Copperweld was made possible by the successful implementation of the Twombly filter, and necessitated by Copperweld's failure in application. The Court's decision to broadly scuttle \*406 the single-entity defense was heavily informed by error-cost principles, if unfortunately implemented in a particularly formalistic way, and does not insinuate sweeping pro-plaintiff changes to Section 1 for the foreseeable future. Indeed, even as American Needle was argued, Chief Justice Roberts maintained substantial hesitancy over even the use of the Rule of Reason, which remained “a continuing project of [the] Court.”153 This work will almost certainly continue as it has for the last 30 years: motivated by a sincere concern for error costs and consistency with economic learning and empirical data.154

#### Courts are historically overburdened now

Witte 12/19 [Griff Witte is a national correspondent for The Washington Post, Mark Berman is a national reporter for The Washington Post who covers law enforcement and criminal justice issues, "Long after the courts shut down for covid, the pain of delayed justice lingers", 12/19/21, https://www.washingtonpost.com/national/covid-court-backlog-justice-delayed/2021/12/18/212c16bc-5948-11ec-a219-9b4ae96da3b7\_story.html]

When the coronavirus struck American shores in early 2020, the red-brick courthouse that has stood sentry on Main Street in Newport, Vt., since the late 19th century abruptly shut down.

So did courthouses nationwide. But unlike most, the one in Newport — a small, lakeside community nestled a short drive from the Canadian border — has never fully reopened.

With jury trials still suspended, cases are being dismissed by the dozen. Defendants live with charges they can’t shake. And Dick Collier lies awake at night, wondering if he will die before the man accused of killing his daughter faces justice.

“That’s my fear,” said Collier, 81, and in precarious health. “That I might not live long enough to see him go to trial.”

Nearly two years after the American justice system was paralyzed by a pandemic, the repercussions continue to radiate through communities nationwide, from tiny towns to the largest cities.

District attorneys face some of the longest case backlogs in living memory. Defendants languish in jails that have become breeding grounds for the coronavirus. Others are set free — and, some prosecutors say, may be contributing to a spike in violent crime that is only compounding the pileup.

Although the shutdown in Newport is extreme — most courthouses are back in action, even if they are not yet at their pre-pandemic capacity — legal officials from coast to coast say justice delayed by covid-19 will continue to be a feature of the American landscape for several years to come. And that’s assuming the courts don’t have to shut down again for omicron or another new variant.

“This is a three-year project to get the number of pending cases back to what it was. And I’m an optimist,” said Dan Satterberg, prosecuting attorney in King County, Wash., which includes Seattle. “It’s a historic challenge that we’re facing right now.”

The backlogged system has had deadly consequences, officials say.

In Wisconsin, Darrell Brooks was set to stand trial this year for allegedly firing a gun at his nephew. Prosecutors were ready, as was the defense. But there was no courtroom available. With the system unable to deliver the speedy trial that Brooks had requested — and that the state was required to deliver — he was released on $500 bail.

While out, court records show, the 39-year-old allegedly tried to use his car to run over the mother of his child and was arrested once more. But an overburdened junior prosecutor juggling a jury trial and two dozen other felony cases set his new bail at $1,000 — an amount the district attorney would later call “a mistake” — and Brooks was released again.

Just days later, on Nov. 21, prosecutors say Brooks plowed his car into the Christmas parade in the Milwaukee suburb of Waukesha, hitting 60 people — and killing six. This time, his bail was set at $5 million.

While critics have focused on the low bail amounts, Milwaukee District Attorney John Chisolm said the case was better understood as the tragic consequence of when courts can’t keep up.

“This is a system issue right now, and it’s only going to get worse,” Chisholm told reporters this month. “These backlogs aren’t going to magically disappear.”

Delays in the U.S. court system are nothing new, of course. Long before the coronavirus, America stood out among its industrialized peers for the extensive wait times from charges filed to verdict delivered.

“It’s not that the criminal justice system was a model of efficiency prior to the pandemic,” said Christopher Slobogin, a law professor at Vanderbilt University. “But now things have gotten much worse, and ultimately that’s not good for anybody.”

#### Docket management solves.

Marin K. Levy 13, Professor of Law at Duke, 2013, “Judging the Flood of Litigation,” University of Chicago Law Review, Vol. 80, pp. 1007-1077, https://scholarship.law.duke.edu/faculty\_scholarship/2854/

This does not leave the courts defenseless against the rising tide, however; they have many tools besides substantive law with which to keep themselves afloat. Perhaps most prominently, both the district courts and the courts of appeals can avail themselves of various procedural rules to help cope with, and indeed limit, their dockets. Most plainly, the Federal Rules of Civil Procedure employ what have been called three basic pretrial “discouragement mechanisms.”311 The first mechanism is the pleading stage itself, with the possibility for a motion to dismiss. Although pleadings obviously have several purposes, scholars have come to identify a significant one as “allowing a court to screen cases for merit.”312 At this juncture, courts can siphon off some of the frivolous cases that come before them. The second mechanism is summary judgment. The main goal of Rule 56 has been said to be “filtering out cases not worthy of trial,”313 and that rule is now regarded as a “powerful tool for judges to control dockets.”314 A third mechanism is the possibility of Rule 11 sanctions, which were developed to “punish lawyers for advancing meritless contentions that wasted the courts’ attention”315 and to deter such litigation from coming into court in the first place.316 In short, the district courts have at their disposal several critical procedural rules that have been fashioned, at least in part, so that district courts can more quickly dispose of frivolous filings and streamline the litigation process more generally.

Many of the mechanisms that exist at the district court level have analogues at the courts of appeals. Through the Federal Rules of Appellate Procedure, the circuit courts have several key ways to manage their dockets and reduce the time taken by frivolous filings. Rule 34 permits appeals courts to decide cases without oral argument317—a powerful time-saving mechanism.318 Additionally, courts of appeals can rely on staff attorneys to help draft summary dispositions.319 Finally, per Rule 38, if a court of appeals determines that a particular filing was frivolous, the court can award damages and costs to the appellee.320

Moreover, these mechanisms of the federal courts are not static—if they are insufficient to curb the flow of frivolous cases, they can be altered, and indeed have been so altered in the past. Rule 34, for example, was amended in 1979 to authorize the resolution of an appeal without oral argument whenever a panel agrees that argument is unnecessary because, inter alia, an appeal is frivolous.321 Similarly, Federal Rule of Civil Procedure 11 was amended in 1983 precisely to reduce the number of frivolous filings.322

And although this has been more controversial, the Supreme Court itself has shifted the meaning of various procedural rules in its own opinions.323 In 1986, the Court in a trilogy of cases324 solidified Rule 56 as “a powerful tool for the early resolution of litigation.”325 And of course, more recently, the Court altered pleadings with its decisions in Bell Atlantic Corp v Twombly326 and Ashcroft v Iqbal.327 There can be disagreement about the propriety of the way these rules have shifted over time, but the point remains that the federal courts have an extensive set of procedures to manage their dockets, and these procedures can be ratcheted up if they prove insufficient.

What this discussion suggests is that, when compared to floodgates arguments that express interbranch and intersystemic concerns, those that express court-centered concerns are on significantly shakier ground. Barring a true flood of tens or hundreds of thousands of cases, no evident principle exists to support the Court taking workload concerns into account when engaging in “[i]nterpretation of the law.”328 Therefore, although the Court may have a legitimate interest in ensuring that the number of filings, and particularly frivolous filings, does not become too high, it should be wary of using substantive law as the limiting device. Speaking of unmeritorious cases in particular, Justice Stevens has argued, “Frivolous cases should be treated as exactly that, and not as occasions for fundamental shifts in legal doctrine. Our legal system has developed procedures for speedily disposing of unfounded claims; if they are inadequate . . . then there is something wrong with those procedures, not with the law.”329 Accordingly, the Court should have a presumption against using court-centered floodgates arguments. The problems of case flow should be addressed through case management and, more broadly, the tools of Congress.

#### Antitrust is 1% or less of the docket

Ginsburgh 12 - (\*Douglas H. Ginsburg \*\*Joshua D. Wright \*Senior Circuit Judge, United States Court of Appeals for the District of Columbia Circuit, and Professor of Law, George Mason University \*\*Commissioner, Federal Trade Commission, and Professor, George Mason University School of Law and Department of Economics; 9-20-2012, FTC, "Antitrust Courts: Specialists Versus Generalists," doa: 1-1-2022) url: https://www.ftc.gov/sites/default/files/documents/public\_statements/antitrust-courts-specialists-versus-generalists/130722ginsburg\_wright.pdf

At one end of the spectrum are the generalist courts of the United States, such as the twelve Circuit Courts of Appeals that review the decisions of the Federal Trade Commission and, in private cases, the judgments of the federal trial courts. Antitrust cases account for less than one percent of the total caseload in each of the appellate courts.2

[Begin Footnote 2]

2. ADMIN. OFFICE OF THE U.S. COURTS, JUDICIAL BUSINESS OF THE U.S. COURTS: 2011 ANNUAL REPORT OF THE DIRECTOR, tbl. B-7 (2011) [hereinafter AOUS]. The ninety-four federal district courts decide in the first instance cases brought by the Antitrust Division of the Department of Justice or by a private antitrust plaintiff. Id. tbl. C-2A. In each of the past five years, antitrust cases accounted for less than half of one percent of their overall case load, though the percentage was no doubt somewhat higher in at least a few districts. Id.

[End Footnote 2]

A somewhat more specialized model can be found in some countries, such as Portugal, where (from 2008 until the creation in 2012 of a single antitrust court) the review of NCA decisions has been vested in the commercial section of the geographically competent general court.3 Another variation of the somewhat specialized model appears in France, where all challenges to the decision of the NCA are referred to a particular chamber of the Paris Court of Appeals that hears other types of cases as well. A still more specialized model puts review of the NCA’s decision in a “business” or “commercial” court, such as the Market Court in Finland or Chamber 13 of the Council of State in Turkey. A bit further along the spectrum are courts that specialize in reviewing economic regulatory decisions, such as the Competition Appeals Tribunal in the United Kingdom, which reviews decisions of the NCA and of the various sectoral regulators. Finally, there are courts, such as the Competition Appellate Tribunal of India, that review decisions of the NCA alone.4

#### Most antitrust cases are resolved with settlements—that prevents clog.

William Berkowitz 21. Berkowitz is Partner and National Chair, Antitrust & Competition Practice Group. Brandon Bigelow is Partner and National Co-Chair, Antitrust & Competition Practice Group and Alison Eggers is Partner, Antitrust & Competition and Franchise & Distribution Practice Groups. “Key Trends in Commercial Litigation: Antitrust.” Commercial Litigation Outlook 2021, p. 8, <https://www.seyfarth.com/dir_docs/publications/Commercial-Litigation-Outlook-2021-Edition.pdf>

Companies in all sectors should expect that the FTC and DOJ may give more scrutiny to transactions that in the past might have easily cleared HSR review. Finally, the parties in a number of major antitrust class action litigation matters reached settlements in 2020, including matters involving alleged price fixing in the packaged seafood market and collusion among various Blue Cross/Blue Shield insurance providers to suppress competition between those plans. Businesses are often members of these certified classes, and given the volume of their purchases in these markets, often can recover substantial sums from these settlement funds. Businesses should be on the lookout for court-ordered notices concerning these settlements to make sure they do not waive any rights. Businesses also should be skeptical of companies that offer to “assist” with the submission of claims; these companies often demand a substantial percentage of any recovery for their work, even though settlements are typically designed to make claims submission easy.

#### Be highly skeptical of the DA – it has zero empirical basis

Robert H. Lande and Joshua P. Davis ‘8. Venable Professor of Law at the University of Baltimore School of Law and a Director of the American Antitrust Institute; and Professor of Law and Director, Center for Law and Ethics at the University of San Francisco School of Law and a member of the Advisory Board of the American Antitrust Institute. “BENEFITS FROM PRIVATE ANTITRUST ENFORCEMENT: AN ANALYSIS OF FORTY CASES.” University of San Francisco Law Research Paper No. 2010-07. http://ssrn.com/abstract=1090661

While these criticisms are longstanding and widespread, they have been made without any systematic substantive or empirical ba- sis.35 Those who point to the perceived flaws of private antitrust enforcement typically offer only anecdotes, some of which are questionable,

rather than provide reliable and rigorous data to sup- port their arguments.36 Indeed, the same point applies to attacks on private litigation generally—critics tend to make factual assertions without an adequate empirical basis. We emphasize that we are not disputing that the anecdotes the critics use may raise important con- cerns about abuses in particular cases. Private antitrust enforcement certainly is not perfect.37 The contention of this Study is, however, that a valid assessment of the net efficacy of private antitrust enforce- ment, which accounts in most years for more than ninety percent of filed antitrust cases,38 is possible only by also systematically consider- ing its benefits to victimized consumers and businesses, and to the economy and the public interest more generally.

# 1AR

### 1AR – A1

#### Warming outweighs nuclear war

McDonald ‘19 (Samuel Miller McDonald is a writer and geography PhD student at University of Oxford studying the intersection of grassroots movements and energy transition; 1/4/19; “Deathly Salvation”; *The Trouble*; https://www.the-trouble.com/content/2019/1/4/deathly-salvation)

A devastating fact of climate collapse is that there may be a silver lining to the mushroom cloud. First, it should be noted that a nuclear exchange does not inevitably result in apocalyptic loss of life. Nuclear winter—the idea that firestorms would make the earth uninhabitable—is based on shaky science. There’s no reliable model that can determine how many megatons would decimate agriculture or make humans extinct. Nations have already detonated 2,476 nuclear devices. An exchange that shuts down the global economy but stops short of human extinction may be the only blade realistically likely to cut the carbon knot we’re trapped within. It would decimate existing infrastructures, providing an opportunity to build new energy infrastructure and intervene in the current investments and subsidies keeping fossil fuels alive. In the near term, emissions would almost certainly rise as militaries are some of the world’s largest emitters. Given what we know of human history, though, conflict may be the only way to build the mass social cohesion necessary for undertaking the kind of huge, collective action needed for global sequestration and energy transition. Like the 20th century’s world wars, a nuclear exchange could serve as an economic leveler. It could provide justification for nationalizing energy industries with the interest of shuttering fossil fuel plants and transitioning to renewables and, uh, nuclear energy. It could shock us into reimagining a less ~~suicidal~~ civilization, one that dethrones the death-cult zealots who are currently in power. And it may toss particulates into the atmosphere sufficient to block out some of the solar heat helping to drive global warming. Or it may have the opposite effects. Who knows? What we do know is that humans can survive and recover from war, probably even a nuclear one. Humans cannot recover from runaway climate change. Nuclear war is not an inevitable extinction event; six degrees of warming is.

### 1AR - CP

#### Filed rate doctrine protects unreviewed state behaviors which circumvents agency review

Wara 17 [Michael, Associate Professor and Justin M. Roach, Jr. Faculty Scholar, Stanford Law School. “COMPETITION AT THE GRID EDGE: INNOVATION AND ANTITRUST LAW IN THE ELECTRICITY SECTOR”. 10/25/17. https://www.nyuelj.org/wp-content/uploads/2016/09/Wara\_ready\_for\_printing\_v2.pdf]

The filed rate doctrine has also been an important defense for utilities to antitrust claims. The Supreme Court, in Keogh, held that a private plaintiff may not recover antitrust damages from a regulated firm so long as the tariff or rate schedule of the firm has been filed with its public utility commission.135 Later, the Supreme Court, in reaffirming the filed rate doctrine, admitted that it may have been “unwise as a matter of policy” but noted that since Congress had had numerous opportunities to overturn the doctrine and had failed to do so, the court would not upset settled precedent.136 The filed rate doctrine has been extended from federal contexts to also cover regulated rates overseen by state agencies.137

The filed rate doctrine generally protects any rate or tariff filed with the appropriate public utility commission, whether or not it has been reviewed and found to be just and reasonable.138 However, this protection extends only to suits brought by customers or purchasers of rate regulated goods from the regulated firm and not generally to suits brought by competitors.139 In reaching this conclusion, courts have reasoned that a rule intended to ensure uniformity of rates between customers should not provide an unfair advantage to a utility with respect to its competitors.140 Thus, while the filed rate doctrine would almost certainly insulate utilities from antitrust claims brought by unhappy customers seeking lower rates, it will not serve the same purpose for claims for damages or injunctive relief brought by a competitor firm for harm to their business, even when such harm is caused by rates filed with a public utility commission.

#### That matters a lot

Trujillo 6 [Elizabeth, Visiting Professor, Florida State University College of Law, 2005-2006; Assistant Professor of Law, University of Detroit Mercy School of Law. “State Action Antitrust Exemption Collides with Deregulation: Rehabilitating the Foreseeability Doctrine “. January 2006. https://scholarship.law.tamu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1796&context=facscholar]

The pervasiveness of regulation in the business of electrical power generation has left utilities little room for antitrust law.'" One particularly useful tool for potential antitrust defendants is the state action immunity doctrine. The original purpose of state action immunity is to preserve principles of federalism and allow states to displace competition in sectors of their domestic economies so as to compensate for the failures of competition and protect the public welfare of its citizens." Essentially, it is a judicially created exemption that limits the potential antitrust liability of private parties, as well as municipalities and government entities.'2 For an entity to successfully allege state action immunity, it must prove that it is advancing the interests of the state rather than its own interests. This is done by showing that the conduct is pursuant to a "clearly-articulated" state policy and that it has been "actively supervised" by the state. 13 Under a regime that promotes competition rather than displaces it, broad application of state action immunity would hinder state efforts to open electrical markets for competing new entrants.

Attempts by states to implement "pro-competition" policies without restructuring traditional regulatory paradigms have been problematic for courts. Furthermore, the tendency of courts to defer to agency rulings has shifted jurisdictional parameters and empowered the state regulatory commissions. This has been particularly apparent in cases dealing with the wholesale natural gas market and the filed rate doctrine.14 In the context of state action immunity and partial deregulation of electricity, broad deference to regulatory policy in addition to broad application of state action would favor already established companies in the electricity market, essentially empowering the regulatory agencies and in turn, advancing the interests of the dominant companies which they regulate.15 In this scenario, antitrust law helps to de-concentrate theseindustry structures and prevent price fixing where regulation cannot. In effect, broad application of state action immunity would continue to preserve old regulatory structures where regulated entities such as utilities would continue to dominate the electrical market, eliminating any possibilities of consumers benefiting from deregulatory measures promoting competition - lower prices and choices. 16

#### Here’s another card – revolving door that doesn’t link to FTC and Courts because they don’t have those relationships

Macey 20 [Joshua C. Macey, Assistant Professor of Law, University of Chicago Law School. His Article Zombie Energy Laws (73 Vand. L. Rev.) received the 2020 Morrison Award for most impactful environmental law article of the previous year. “Zombie Energy Laws .” May 2020. https://scholarship.law.vanderbilt.edu/cgi/viewcontent.cgi?article=3475&context=vlr]

B. Regulatory Capture

Legal and economic historians have not, however, unanimously endorsed the view that cost-of-service regulation followed from the theory that the utility industries were natural monopolies. Scholars have also suggested that public utility regulation reflected regulators’ attempts to support the industries that had managed to curry favor with energy regulators.

There is evidence that the capture theory accounts for at least part of the sudden rise of utility rate regulation. Utility regulation was immensely profitable for the energy companies that managed to use it to shield themselves from competition, and prominent public service commissioners worked for the industries they regulated before and after becoming commissioners.48 Insull himself stood to benefit if regulators accepted his economic argument because doing so would have the convenient effect of shielding his electricity franchises from competition.

It is perhaps unsurprising, therefore, that energy companies such as those operated by Insull would lobby for public utility regulation. When a regulator or legislature designated a business a public utility, the business would generally be shielded from competition and enjoy a protected stream of revenue. From the perspective of utilities, it was clearly preferable to have a captive customer base than to be forced to compete with other railroad and energy companies.

### 1AR - DA

#### Expansion of scope is inevitable.

Scarborough ’11-2 [National Law Review; 2021; Partner in the firm's San Francisco office at National Law Review and the U.S. Chair of the firm’s Antitrust and Competition Group; National Law Review, “Senate Zeros in on Big Tech with Latest Antitrust Reform Bill,” <https://www.natlawreview.com/article/senate-zeros-big-tech-latest-antitrust-reform-bill>]

On the Senate side, Senator Klobuchar has also introduced the Competition and Antitrust Law Enforcement Reform Act of 2021, which increases antitrust enforcement budgets, strengthens prohibitions against anticompetitive mergers, and updates the Clayton Act to prohibit “exclusionary conduct that presents an appreciable risk of harming competition.”  Further, Senator Mike Lee (R-UT), has introduced the [Tougher Enforcement Against Monopolists Act](https://www.lee.senate.gov/services/files/23028e91-a982-43d0-9324-f6849c7522fc) (creating market-share presumptions for merger review and codifying the consumer welfare standard), [State Antitrust Enforcement Venue Act](https://www.lee.senate.gov/services/files/3e0224a6-7b0f-49cf-9288-175d35095415) (allowing state attorneys general to keep antitrust defendants in their desired fora), and the [One Agency Act](https://www.lee.senate.gov/services/files/c025c934-96a6-4bb9-8c3a-794a712e7955) (consolidating merger review in the Department of Justice).  Senator Josh Hawley (R-MO) has also introduced the [Trust-Busting for the Twenty-First Century Act](https://www.hawley.senate.gov/sites/default/files/2021-04/The%20Trust-Busting%20for%20the%20Twenty-First%20Century%20Act.pdf), which would explicitly ban companies with market capitalizations exceeding $100 billion from any mergers or acquisitions.

While it is highly unlikely that all these competing bills will become law, some amount of legislated antitrust reform targeting Big Tech seems almost inevitable.

#### ‘Floodgates’ are fake---established docket control works

Meredith M. Render 20, Professor of Law at the University of Alabama School of Law, JD from the Georgetown University Law Center, BA from Boston College, “Fiduciary Injury and Citizen Enforcement of the Emoluments Clause”, Notre Dame Law Review, 95 Notre Dame L. Rev. 953, January 2020, Lexis

First, as previously discussed, there is reason to be skeptical about the efficacy of the CAP rule in terms of reducing the overall number of cases in the federal courts. 315 Moreover, in addition to the fact that the CAP rule likely does little to reduce the overall number of opportunities for federal courts to judge the behavior of coordinate branches, there is reason to [\*1007] believe that the opening-the-floodgates worry itself is overblown. 316 Not only is the floodgates argument in support of the CAP rule lacking in empirical support, 317 but it may also be lacking in a clear, germane, and substantive content when used by various members of the Court. 318F or example, Professor Marin Levy has observed that "recent cases show the justices vacillating between providing assurances that their decision will not result in a deluge of new claims, and accusing each other of being driven by an improper desire to stave off such a deluge." 319 The floodgate alarm has been used in diverse and internally inconsistent contexts without the mooring benefit of evidentiary support, such that it has taken on more the character of epithet than of a serious constitutional obstacle. 320Justice Ginsburg, writing in dissent, has succinctly summarized this development, stating: "The 'floodgates' argument the Court today embraces has been rehearsed and rejected before." 321

The fact that the floodgate rationale is frequently used to support both sides of a contested determination by the Court suggests that it may lack a stable normative content. 322 The floodgate rationale is, at heart, a prediction about how future litigants will behave if the Court adopts a new rule. Yet the ordinary norms of prediction with their attendant empirical safeguards seem not to obtain. 323 Those invoking the floodgate alarm have not felt [\*1008] obliged to supply evidence of past instances in which the federal courts were in fact "flooded" as the result of similar rule changes, and that the Federal Rules of Civil Procedure were inadequate to address the "flood." 324 Given that members of the Court have so frequently predicted a litigatory deluge as a consequence of a rule change, it would seem a simple matter to confirm that a deluge has, in fact, occurred. 325 However, evidence of past flooding has yet to emerge within the floodgate discourse. 326

It is possible that the reason that the floodgate worry has not been documented may be because it has yet to come to pass. There is ample reason to believe that the Federal Rules of Civil Procedure are generally commensurate to the task of qualitatively stemming the tide of litigation. 327 The Federal Rules of Civil Procedure are designed to weed out duplicative, harassing, frivolous, and meritless cases. 328While no standing rule - including the CAP rule - prevents nonmeritorious cases from being filed in federal court, such cases are generally resolved on a Rule 12(b)(1) motion to dismiss. 329The Rule 12(b)(1) motion to dismiss is also the first opportunity during which a defendant can challenge standing. 330There is no strategic advantage to [\*1009] defendants - in terms of the expenditure of resources - to having a case dismissed for want of standing as compared to any other grounds for dismissal under Rule 12(b)(1). 331Likewise, doctrines and mechanisms designed to conserve both judicial and defendant resources, such as claim preclusion, issue preclusion, abstention, joinder, and case consolidation, all operate to prevent horizonal lawsuits alleging the same nexus of operative facts from going forward simultaneously in multiple district courts - a point that is especially important in the emoluments context where presumably any citizen suit would allege the same operative facts. 332

#### Work gets delegated OR new resources are added

Marin K. Levy 13, Associate Professor of Law at the Duke University School of Law, JD from Yale Law School, “Judging the Flood of Litigation”, University of Chicago Law Review, 80 U. Chi. L. Rev. 1007, Lexis

To be sure, judicial workload is a critical concern. As noted earlier, the lower courts have faced rising caseloads over the last several decades 285 - a fact the justices have emphasized. 286 Today, both federal district and appellate judges must contend with hundreds of filings per year, 287 meaning that their ability to give attention to individual cases is greatly reduced. Employing the tools at hand, district judges have come to rely more heavily on the aid of magistrate judges, 288 and appellate judges have come to rely on the assistance of staff attorneys and other case-management tools to cope with their workload. 289 Still, judges and scholars alike have called for an expansion of the bench 290 and limiting the flow of cases 291 to alleviate the strain on the federal courts. Thus, when the justices express their desire to avoid inviting new claims into federal courts, the underlying concern is not a trivial one. 292 The critical question, though, is [\*1066] whether considerations of judicial workload can stand as an independent factor in shaping the Court's interpretation of substantive law.