# 1AC

## 1AC — Kansas HW

### 1AC — Plan

#### The United States federal government should substantially increase prohibitions on anticompetitive business practices by the private sector by expanding the scope of its core antitrust laws to account for “total welfare,” including

#### substantially increasing injunctions on private sector investment in fossil fuels and sale of fossil fuel assets,

#### prohibiting failure to pay a supply-side tax on carbon that rises annually with the social cost of carbon.

### 1AC — Advantage

#### The advantage is Warming —

#### Expanding the scope of antitrust to consider environmental impacts solves warming. The plan causes fossil fuels to stay in the ground

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While courts routinely dismiss noneconomic or “non-welfare” justifications, precisely what procompetitive reasons come into play is, as Justice Stevens famously stated, “an absolute mystery”.242 As Professor John Newman points out, the “relevant case law reveals multiple competing approaches and seemingly irreconcilable opinions” on what constitutes “beneficial”.243 After all, whether a particular activity is beneficial necessarily begs the question— beneficial to what end? Professor Newman traces this confusion to the use of three different tests by courts: Under the “market failure” approach, a valid justification is present if—and only if—the challenged restraint alleviates a market failure. Alternatively, the “competitive process” approach attempts to condemn restraints that harm (and bless restraints that benefit) “competition” itself or the so-called “competitive process”. Lastly, the “type of effect” approach appears to offer a shortcut: simply identify the effects of the challenged restraint, then ascertain whether they align with a pre-approved typology of virtuous marketplace effects (e.g., higher output, lower prices, etc.).244 This Article agrees with Professor Newman’s doctrinal, normative, and practical arguments in favor of the market failure test.245 Most contemporary courts also hold that “alleviating a market failure is an acceptable procompetitive justification.”246 But the market failure test is fundamentally at odds with the market reality of increasing universal ownership. Two limitations explain its inability to account for systematic and portfolio-wide risks. First, the market failure test relies on the prevailing consumer welfare standard.247 That generally means that a particular restraint of trade must alleviate a market failure by increasing consumer surplus in order for courts to deem it a valid procompetitive justification.248 By fastening market failure to consumer welfare, the market failure test becomes indistinguishable from the “type of effect” approach, which also focuses on measurable impacts on consumers including output and price. Second, the market failure test assumes the perspective of a single market, preventing it from capturing portfolio-wide systemic risks like climate change. To be clear, this Article is not arguing that antitrust law should abandon the consumer welfare standard and expand its purview to encompass noneconomic impacts. Rather, it argues that the consumer welfare standard is too narrow to account for economic impacts on a portfolio-wide level. The total welfare standard is most closely aligned with the market reality of universal ownership, although it has been largely abandoned by courts.249 It seeks to maximize the total surplus of all participants in a market, including consumers and producers. The total welfare test’s aggregate value approach is more closely aligned with universal ownership, but it also analyzes an individual market—as opposed to market-wide impacts— because a so-called “general equilibrium analysis” is impractical. Developing a standard that aligns with the market reality of concentrated ownership is beyond the scope of this Article. This Article does argue, however, that the current consumer welfare standard impedes collaboration to address systematic economic risks, as the next Part explores

**Green antitrust necessitates a carbon tax**

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7 Green antitrust excuses government failure to regulate In the classical economic approach, damaging side-effects of market interactions are seen as externalities. The solution is to force market participants to internalize these externalities. The social costs of pollution, for example, then become part of the production costs to be expressed in the product prices. Higher prices decrease demand and thereby environmental damage, while higher costs incentivize firms to look for more sustainable production methods. This way, market forces are harnessed to benefit the environment. Through competition, an optimal allocation of production and consumption will result, based on a society’s preferences for the climate relative to consumption goods. The efficient allocation of scarce resources over alternative means then remains firmly based on consumer sovereignty, i.e. the preferences of the people.36 Care for the future has a prominent place in this framework. Welfare of future generations is taken into account, for instance through the intergenerational altruism and bequest motives of the current population.37 This is also how the future can consistently enter into competition authorities’ assessments of green efficiencies. It is first and foremost a government task to ensure that the social costs of production are reflected in the private costs of manufacturers. This can be done through taxation, or by ensuring that private property rights for climate-related issues are well defined, such that private parties will ensure that the costs of their use will be priced in. Where this is hard to achieve, for instance because the source of pollution remains disputed, governments can use direct regulation to force firms to produce in a more sustainable way. Unsustainable production, like under-provision of public goods, is a well-understood market failure, but it is a government failure that well-known solutions have only been sparingly used in the last several decades. Trying to remedy this government failure by creating a market failure – market power – seems a response that is itself doomed to fail. . To begin with, trying to have private market power advance public interests is orthogonal to key lessons of classical public economic theory. One way of seeing this green antitrust policy is as mandating private companies to increase their prices by an overcharge, i.e. “tax” a private good, and to use that money to finance a compensating public good; sustainability. Samuelson’s rule prescribes that public good provision should be increasing with the utility that people derive from the public good. But for an anticompetitive sustainability agreement, the higher the willingness to pay for sustainable products, the less sustainability the corporate cooperative needs to deliver to compensate consumers for a given product price increase. After all, consumers with a high appreciation for green can be made indifferent with less of it, compared with consumers that appreciate green little. There is no reason for a green corporate cooperative to invest more of its extra revenue in sustainability than it is minimally required to do: the rest it can pocket as profit. Government, though certainly imperfect, at least strives for optimal taxation and break-even public good provision. Companies with market power instead have an incentive to maximize their margin.

#### That solves warming by overhauling the electricity sector

**Kaufman et al. 16** - economist for the U.S. Climate Initiative in the Global Climate Program; Michael Obeiter, member of the U.S. Climate Initiative; Eleanor Krause, conducts research and analysis for WRI's Carbon Pricing program through the U.S. Climate Initiative,

(Noah, “PUTTING A PRICE ON CARBON: REDUCING EMISSIONS”, January 2016, <http://admin.indiaenvironmentportal.org.in/files/file/Putting_a_Price_on_Carbon_Emissions.pdf>)

**The electricity sector produces more greenhouse gas emissions than any other sector** in the United States. **Over four billion megawatt hours of electricity are produced each year, approximately two thirds of which are produced using fossil fuels** (U.S. EIA 2015a). **The result is over 2 billion metric tons of annual CO2 -equivalent emissions, which comprise roughly one third of total** U.S. greenhouse gas **emissions** (U.S. EPA 2013a).¶ **For the United States to meet its emissions reduction targets, fossil-fuel usage in the electricity sector must be significantly curtailed**. **Fortunately, there are viable alternatives**. Nuclear energy provides nearly 20 percent of total electricity generation, and renewables provide another 13 percent (U.S. EIA 2015b). The amount of electricity produced by solar and wind energy in particular has increased dramatically in the past decade as the costs of these technologies have plummeted (Feldman et al. 2012), making them a more viable alternative to fossil-fuel generation each year.¶ Still, **absent strong climate change policies, the transition away from fossil fuels is unlikely to occur quickly enough to enable the United States to achieve its emissions targets**. **Accounting for the effects of the Clean Power Plan** (the regulation of greenhouse gas emissions from existing power plants), the U.S. Environmental Protection Agency (**EPA) forecasts that fossil fuels will still comprise about 60 percent of U.S. electricity generation in 2030**. As explained below, **carbon pricing can have dramatic effects on emissions in the electricity sector**. **As soon as the policy is implemented, high-carbon generating units will operate less often because of higher operating costs. The carbon price will also change decisions about how much electricity to consume, which plants to build, and what efficiency measures to implement**. Simultaneously, **pricing carbon will induce investments in low-carbon technologies, the development of which will be crucial if the United States is to meet its long-term emissions targets**. **A carbon price translates societal costs of climate change into explicit costs to electricity producers**, and the price of electricity will incorporate these additional costs. **In response, some producers and consumers will adjust their behavior to save money**, as they would in response to any other increase in costs. **Unlike in other sectors, where change takes place gradually, the electricity sector has systems in place to adjust to the carbon price virtually immediately.** In any power system, due to the difficulties of storing electricity, producers build sufficient generating capacity to exceed customers’ maximum demand levels. As a result, significantly more resources are usually available to serve customers than are needed on a daily basis. **The resources operating at any given time depend on a multitude of factors**—including geographic location, the costs of starting and stopping power plants, and whether plants are engaged in a bilateral contract—**but no factor is as important as operating costs** (U.S. EIA 2012). In simplified terms, **power plants with the lowest costs of operation are “dispatched”** first, and **those with higher costs are brought on line sequentially as demand increases** (U.S. EIA 2012.) Because demand for electricity is constantly fluctuating, the dispatch of power plants changes frequently as well. **Electricity grids are therefore designed to respond almost immediately to changes in the cost of fuel** (due to a carbon price or any other reason). Figure 2 displays a hypothetical (and greatly oversimplified) electricity grid “dispatch curve,” with and without a carbon price. **Because a carbon price increases the costs of operating fossil-fuel units in proportion to the carbon content of the fuel, the primary consequence** (in the very short run) **is a reduction in generation from coal units, which have the highest emissions rate of any electricity source**. The biggest beneficiaries of this immediate adjustment are natural gas units, whose operating costs (with no carbon price) are higher than coal plants on average (U.S. EIA 2015c) but, because of the lower carbon content of natural gas, pay a carbon price that is only 50 to 60 percent of the price paid by coal plants for the same generation (U.S. EIA 2015d). Once built, the costs of operating nuclear and renewable energy units are typically much lower than those of coal or natural gas plants, so a carbon price will not significantly affect the usage of these units in the very short run (but **a carbon price does incentivize the construction of more renewable plants**, as explained below). Indeed, **changes in operating costs have caused large fluctuations in coal and natural gas usage in recent years** (see Box 2 below), **confirming the intuition** of Figure 2. Short-run Effects of Carbon Pricing in the Electricity Sector In the short run, responses to a carbon price in the electricity sector are somewhat constrained by existing commitments and the lags associated with construction and large purchases. Nevertheless, **both producers and consumers will begin to change their behavior in the short run when the costs of carbon-intensive goods and services increase. Owners of electricity generation facilities can retrofit or refurbish fossil-fuel power plants so that they produce the same amount of electricity while burning less carbon**. **A coal plant operator will find that efficiency alternatives that were too costly without a carbon price are cost-effective with one**. A study by Resources for the Future concluded that a carbon price of $10 per metric ton would lead to reductions in emissions rates at coal plants of 1 to 2 percent, with higher prices leading to greater efficiencies (Linn et al. 2014). **Because the carbon price also encourages reduced usage of coal-fired power plants, the efficiency gains will lead to emissions reductions** (in contrast, policies that mandate efficiency improvements can encourage coal units to operate more often, because more efficient plants are less costly to operate) (Linn et al. 2014). **A carbon price also affects electricity consumption decisions**. **When the price of electricity increases, consumers tend to use less of it** (EPRI 2008). **Lower demand for electricity will typically lead to a fall in usage of fossil-fuel power plants because they have the highest operating costs**. Reduced electricity usage also implies lower electricity bills, and the net effect of a carbon price on electricity bills depends on the extent to which consumers respond to the price change.3 Economists have exhaustively studied the extent to which electricity demand decreases when prices increase (referred to as the “price elasticity of demand”). Table 1 displays the results of recent studies of the short-run (i.e. usually within the first few years, although definitions vary) and longrun responsiveness of U.S. electricity consumers to electricity price changes. In the short run, **consumers respond to changes in electricity prices by reducing their demand for electricity, but they do not respond as much as they do over longer periods, when consumers have had the opportunity to invest in more efficient machinery and appliances.** Short-run elasticities between −0.1 and −0.4 imply that a 10 percent price increase would only lead to a 1−4 percent reduction in electricity use. Some consumers may at first perceive the price change to be temporary (if they notice it at all), and others may not adjust their behavior until they purchase new equipment or appliances. **In the long run, consumers are more responsive to a carbon price, in large part because they are less constrained by currently installed technologies. The long-run price elasticities in Table 1 imply that a 10 percent electricity price increase will lead to an average of 3 to 12 percent reductions in electricity use**. Such a wide range should not be surprising, considering the diversity of consumers and electricity uses across the economy. **Consumer responses to a carbon price may be larger than are suggested by these empirical estimates based on general electricity price changes**, for several reasons. First, **a carbon price may be perceived as more permanent**, **which could cause consumers to change their behavior rather than wait** for temporary price increases to subside. In addition, **the salience of the tax may coax consumers into fundamentally reducing electricity consumption**, either to save money or for altruistic reasons (Chetty et al. 2007). The UK introduced a “Climate Change Levy” in 2001 that taxed electricity use at roughly 10 percent. **A study of manufacturing plants and other commercial users found that electricity use declined by over 22 percent at plants subject to the tax compared to plants that were eligible to opt out** (Martin et al. 2011), **which implies a much larger response than the elasticities presented above**. (The authors of the study caution that some of this shift away from electricity in the UK may have been toward gas and coal, which were taxed at lower rates, thus offsetting the emissions reductions from the policy.) Finally, **progress with “smart grids” and home energy management products could enable individuals and businesses to respond more efficiently to price signals than they have in the past**. **A carbon price will also have long-run effects on electricity production.** Hundreds of new electricity generating units are brought online each year in the United States, either to meet additional demand for electricity or to replace older generating units (U.S. EIA 2015e). **A carbon price would have a substantial impact on decisions regarding which plants are most cost-effective to build and operate over their lifetimes**. A useful (though imperfect) metric to compare the costs of different types of new power plants is the levelized cost of electricity (LCOE), which depicts the lifetime costs of producing a given amount of electricity, including the costs of building and operating the plant. Figure 4 displays LCOE estimates from the company Lazard, with and without illustrative carbon prices of $25 and $50 per metric ton. Coal plants are omitted because few are likely to be built in the United States going forward.4 Figure 4 shows that **with a carbon price, wind and solar become more competitive with natural gas**, which has been the dominant source of fossil-fuel electricity being added to the grid for more than a decade (Shellenberger et al. 2014). While (unsubsidized) solar would remain more expensive than natural gas in some regions of the country at today’s prices, **this will change if the cost of solar energy continues to fall** (Feldman et al. 2012). **Building wind and solar units in lieu of natural gas plants avoids decades of emissions that would come from those plants** (although it also introduces challenges associated with more unpredictable generation sources). **A carbon price will cause grid operators to dispatch lower-carbon generation alternatives, producers to retrofit existing power plants and build new lower-carbon plants, and consumers to use less electricity**. Taken together, **these actions will lead to substantial emissions reductions in the electricity sector**. U.S. EIA estimated the effects of a national carbon price in its 2014 Annual Energy Outlook Report (U.S. EIA 2014a).5 EIA’s modeling is widely cited and highly influential, and its results are broadly similar to other prominent energy/economic models (Fawcett et al. 2015) (many of which rely in part on information from EIA). **We display results for EIA’s carbon price scenarios that start at a price of $25 per metric ton** (in 2012 dollars) in 2015, **growing at 5 percent per year**. This carbon price trajectory is comparable to certain projections of carbon prices from the cap-and-trade program that passed the U.S. House of Representatives in 2009 (as part of the American Clean Energy and Security Act, commonly known as “Waxman-Markey”) (U.S. EIA 2009). However, the price trajectory is low compared to economists’ and scientists’ best estimates of the carbon prices needed to achieve long-term emissions targets.6 While implementation of a national economy-wide carbon price in the next few years is unlikely, EIA’s results should be viewed as illustrative of how a model of the U.S. economy and energy system forecasts the impacts of a carbon price over the first 10 to 15 years of implementation. ¶ Table 2 displays the results of EIA’s analysis for the electricity sector. **Retail electricity prices increase by 14 percent in 2030** compared to the Reference Case (which differs only in its lack of a carbon price), **leading to a reduction in electricity usage of 6 percent**. Recall that the best estimates of long-run price elasticities from Table 1 range from -0.3 to -1.2, implying that a 14 percent price increase would lead to a decrease in demand between 4 and 17 percent. EIA’s forecast of 6 percent is near the bottom of that range.¶ On the supply side, **the carbon price causes coal use to decline by 85 percent** below the Reference Case level in 2030. (For comparison, EPA projects the Clean Power Plan to cause a reduction in coal usage of 22 to 23 percent by 2030 (U.S. EPA 2015).) Natural gas usage increases rapidly in the initial years to replace this coal generation. **By 2030, with higher carbon prices and more time to build new infrastructure, renewable energy increasingly replaces coal (and** to some extent **natural gas**) generation.¶ **EIA’s forecasts of changes in electricity supply are pessimistic in that the model does not consider the possibility of transformative changes or disruptive technological progress. It assumes that no new technologies provide meaningful competition to fossil fuels, even though a carbon price will increase the incentive for technological progress** (discussed in the next section). In fact, **the recent trends of rapidly decreasing costs of solar and wind technologies are assumed not to continue—for example, the projected costs of building utility-scale solar photovoltaic generating plants are assumed to remain higher through 2025 than typical cost estimates from 2014**.7 Consequently, **the extent to which wind and solar generation is available to replace coal and natural gas generation is constrained in EIA’s analysis, and consumers are not increasingly responsive to price changes due to innovative “smart grid” technologies.**¶ **Still, EIA projects that the carbon price reduces electricity sector emissions in 2030 by over 60 percent** below Reference Case emissions levels. Actual emissions reductions in the sector could be larger or smaller. But **if clean energy technologies continue to improve, it is far more likely that a carbon price will cause larger emissions reductions than are predicted in these conservative forecasts.**

#### Fossil fuel markets are anticompetitive with renewables---the plan puts prohibitions on carbon asset investment, extraction, and supply dumping

AAI 2008 (American Antitrust Institute, Albert Foer is President and co-founder of the AAI. He has experience as a lawyer in private practice with Hogan & Hartson and Jackson & Campbell, was a senior executive of the FTC Bureau of Competition, Robert Lande, the co-founder, is the Professor at the University of Baltimore Law School; AAI’s report of competition policy recommendations to the Obama administration, Chapter 10, 10/6/2008 “Energy: The Importance of Competition and the Role of Antitrust” American Antitrust Institute https://www.antitrustinstitute.org/work-product/aai-transition-report-on-competition-policy-to-the-44th-president-of-the-united-states/)

That competition policy has an important role in energy policy may seem surprising. Competition policy typically is thought of as a mechanism to keep prices low and to increase consumption—seemingly the opposite of what is required to reduce the nation’s use of and dependence on fossil fuels. Yet competition can play an important role in three major and related ways. The first is to ensure that energy prices reflect marginal costs, including the full social costs of extraction and use of fossil fuels. When private costs do not include environmental, health, and other social costs, production and usage decisions are distorted even in what appears to be a highly competitive market. Also having high priority are programs to foster the development of new technologies involving energy sources more benign than fossil fuels and that use energy more efficiently. Correct price signals will help. But the government will also need to take explicit action through policies that promote the adoption of new energy sources and technologies along the least costly path of adjustment and away from sources of greenhouse gases. Energy development policy in the past has not been attentive to the hazards of market power, with the result that the benefits of policy have been compromised by the creation of major market problems. Third, energy policy often involves the development of new market institutions and the modification of existing ones, but in electricity and petroleum refining, the design and operation of these markets have been fundamentally flawed. The result is that crucial institutions and processes have gone awry, with higher costs to consumers and major new costs borne by some producers. At the same time, some players have reaped supranormal profits by exploiting these mechanisms to their own advantage. The importance of competition is therefore clear. The primary instruments of competition are antitrust policy and regulatory policy. Antitrust seeks to prevent anticompetitive practices, while regulatory policy strives to ensure full recognition of costs and prudent decision-making by companies having broad social effects. In industries such as electricity and petroleum refining and marketing, collusion, **mergers** and joint ventures can create or enhance monopoly power, while boycotts, product ties and refusals to deal can extend monopoly power from one market into others. These practices can harm competition by raising price, by foreclosing smaller, potentially more efficient producers from disciplining the market, and by preventing new firms from bringing new energy technologies to the market. The first line of defense against anticompetitive mergers and suspect business practices is rigorous review by agencies that are best suited to performing it. Their mission is to prevent the erosion of competition and the creation of barriers to entry into energy industries. Competition policy also includes the government's role in creating and regulating markets for maximum efficiency. Good market design is crucial for giving market participants the right incentives to engage in efficient decisions about pricing, output, and innovation. Three examples illustrate the importance of market design. First, the most promising method of efficiently curtailing emissions of greenhouse gases (GHGs) is likely to be a cap-and-trade program, such as is currently being created by several U.S. states and the European Union. But the effectiveness of the cap-and-trade approach depends on designing a well-functioning competitive market in emissions permits. Second, the design of wholesale markets for electricity inevitably involves a mix of regulated and less- or unregulated entities whose operations must dovetail. Third, given the severity of the energy problem, there is a fundamental contradiction between the need and desire to make technology available broadly and the use of the intellectual property system to motivate private investment. Programs to support the development and diffusion of new technology are most effective if government grants and subsidies are constructed to promote innovative competition, rather than to support industry-wide joint ventures in research and development or to award a “winner take all” contract that creates a monopoly in a new technology. Energy technology policy may also need to include a large measure of up-front incentives to promote broad innovative effort. Goals should be defined in terms of research accomplishments that move in the right direction and reward the outputs and success from unrestricted competition. As these examples illustrate, market design is an important component of competition policy and has important applications in energy. This chapter explores the role of competition policy in energy. After summarizing the major recommendations, the chapter proceeds by outlining the dimensions of the U.S. energy policy problem. It then moves on to some important principles that should be considered when applying competition policy approaches in energy markets. The chapter then examines a number of specific instances in which competition policy can help in electricity, GHG emissions allowances markets, and domestic petroleum refining and marketing. MAJOR RECOMMENDATIONS With respect to electricity: • Impediments to the ability of the federal antitrust laws to reach anticompetitive conduct involving wholesale electricity rates, such as the filed rate doctrine, and overbroad application of judicially created exemptions from the antitrust laws, such as the state action doctrine, implied immunity doctrine (as applied in Credit Suisse), and primary jurisdiction doctrine should be removed. • The federal antitrust agencies should take major responsibility for determining if a merger is likely to adversely affect competition and for crafting appropriate remedies for anticompetitive combinations. The Federal Energy Regulatory Commission (FERC) should cite to or incorporate the antitrust merger analysis in its merger orders. • Ongoing collaboration between the FERC, the Department of Justice (DOJ) Antitrust Division, and the Federal Trade Commission (FTC) should be encouraged to ensure that the engineering-economic aspects of market analysis are adequately reflected in antitrust merger analysis. • FERC should promote structurally competitive markets through its marketbased rate policies, ensure that its methodology accurately captures the dimensions of electricity markets, and avoid making grants of market-based rate authority in exchange for nonrelated concessions that promote its public interest agenda. • Proposals for the establishment of new markets or regulatory “patches” to poorly functioning markets operated by Regional Transmission Organizations (RTOs) should be carefully scrutinized by the FERC, in conjunction with the federal antitrust agencies, to determine their effect on competition, efficiency, and incentives for entry and innovation. RTOs should, in general, focus the bulk of their attention on management of the grid and transmission planning. • FERC should attempt to address discrimination problems in bilateral electricity markets by considering more aggressive forms of unbundling (e.g., structurally) generation from transmission, when it is reasonably likely that the benefits of unbundling exceed the costs. • Major cost savings and environmental benefits can stem from giving economically appropriate standing for energy efficiency, conservation, and demand response to compete with generation. Entry conditions and the structure of electricity markets can be fundamentally more competitive if consumers can offer demand response in competition with generators. • Energy policy must take steps to educate consumers and policy makers about the damage being done by flat retail electricity rates and the threat that they pose for society by distorting investment and innovation decisions in the energy sector. Flat rates should be replaced with rate structures that better reflect marginal costs. With respect to carbon emissions: • The design and implementation of carbon emissions allowance markets should involve a high degree of coordination between state and federal regulatory, antitrust, and reliability agencies that oversee all related and affected markets, including centralized and bilateral electricity markets, natural gas markets, and other markets for emissions allowances. • As a precursor to addressing market design issues under a cap-and-trade approach, structural issues in carbon markets are worth investigating. It would be worthwhile to do a simple critical loss calculation to determine if any participant in a carbon market has a sufficiently large asset position that the losses it would take on purchasing and withholding allowances would be exceeded by increases in profits to its low carbon electricity assets. In broader carbon markets, market design is the first line of defense against anticompetitive strategies. • The design of carbon emissions allowance markets should strive to prevent the exercise of market power and market manipulation. To prevent collusion, initial auctions for carbon emissions allowances should use single-round formats with restrictions on any one firm purchasing more than a specified percentage. Implementing frequent uniform-price auctions, equal treatment of allowances, and making future allowances available for auction in advance promote price discovery, low transactions costs, and long-term electricity capacity planning. • Monitoring schemes for carbon emissions allowance markets should receive careful attention and draw from other experiences with allowance trading and even centralized electricity markets. With respect to petroleum: • Refining bottlenecks deserve continued attention in the FTC’s analysis of petroleum refining-marketing merger cases. Mergers that increase control of refinery capacity in congested, strategically located, or boutique fuel facilities should be carefully scrutinized to explore fully the possibility of unilateral withholding as a theory of competitive harm. • More subtle mechanisms involving coordinated interaction in petroleum mergers should factor into FTC merger analysis, including the role of exchange agreements between refiners in facilitating coordination on price and output and the effect of mergers on the incentive to restrict or increase investment in refining capacity. • The FTC should exhaustively consider vertical theories of harm in its merger review. High levels of refining and wholesale marketing integration and concentration emphasize the importance of adequately evaluating potential vertical effects. • Natural gas serves as the fastest growing fuel source for electric power generation and potentially competes with electricity and gasoline in some major applications. The antitrust agencies would be well advised to look at convergence issues and loss of potential competition between fuels when they examine mergers. Such mergers should be viewed through the lenses of raising rivals’ costs and harm to actual or potential competition between electricity and natural gas.

#### Cutting off Private Equity seals the fate of fossil fuels— they’re the last investors willing to do business with dirty assets and use legal loopholes to hide emissions

Tabuchi 10/13 (Hiroko Tabuchi, BA from the London School of Economics and Political Science, 10-13-2021, "Private Equity Funds, Sensing Profit in Tumult, Are Propping Up Oil," NY Times, https://www.nytimes.com/2021/10/13/climate/private-equity-funds-oil-gas-fossil-fuels.html

As the oil and gas industry faces upheaval amid global price gyrations and catastrophic climate change, private equity firms — a class of investors with a hyper focus on maximizing profits — have stepped into the fray. Since 2010, the private equity industry has invested at least $1.1 trillion into the energy sector — double the combined market value of three of the world’s largest energy companies, Exxon, Chevron and Royal Dutch Shell — according to new research. The overwhelming majority of those investments was in fossil fuels, according to data from Pitchbook, a company that tracks investment, and a new analysis by the Private Equity Stakeholder Project, a nonprofit that pushes for more disclosure about private equity deals. Only about 12 percent of investment in the energy sector by private equity firms went into renewable power, like solar or wind, since 2010, though those investments have grown at a faster rate, according to Pitchbook data. Private equity investors are taking advantage of an oil industry facing heat from environmental groups, courts, and even their own shareholders to start shifting away from fossil fuels, the major force behind climate change. As a result, many oil companies have begun shedding some of their dirtiest assets, which have often ended up in the hands of private equity-backed firms. By bottom-fishing for bargain prices — looking to pick up riskier, less desirable assets on the cheap — the buyers are keeping some of the most polluting wells, coal-burning plants and other inefficient properties in operation. That keeps greenhouse gases pumping into the atmosphere. At the same time banks, facing their own pressure to cut back on fossil fuel investments, have started to pull back from financing the industry, elevating the role of private equity. The fossil fuel investments have come at a time when climate experts, as well as the world’s most influential energy organization, the International Energy Agency, say that nations need to more aggressively move away from burning fossil fuels, said Alyssa Giachino of the Private Equity Stakeholder Project. “You see oil majors feeling the heat,” she said. “But private equity is quietly picking up the dregs, perpetuating operations of the least desirable assets.” In its report, the Private Equity Stakeholder Project examined the energy investments made by the top 10 private equity firms since 2010, including giants Blackstone, KKR and Carlyle. The report found that about 80 percent of current holdings are in oil, gas and coal. That was despite many of those firms touting their sustainable investments. Private equity firms have emerged as an increasingly powerful, yet secretive, investment force in recent decades. They typically assemble vast pools of money from wealthy or institutional investors in order to invest directly in companies, often those in distress and unable to raise capital in more traditional ways. Because the firms are required to disclose relatively limited information, it can be difficult to get a full view of their holdings or their climate or environmental practices. Drew Maloney, president and chief executive of the American Investment Council, a trade group that represents private equity, said the industry was “playing an important role in the energy transition and investing more each year in renewable energy projects.” In 2020, private equity had funded over half of all private renewable energy projects across America, he said. “This significant investment is delivering more jobs and cleaner energy for the future,” Mr. Maloney said. The private equity industry, which manages $7.4 trillion in global assets, now plays a major role in a wide swath of American life, from firefighting services to nursing homes, often financing its deals with debt while generating profits for its clients and fees for its managers. Clients include public pension funds, which now on average allocate about 20 percent of their investments in private equity. In the fossil fuel industry, one effect of sales to private equity investors is to transfer those assets, and their emissions and other environmental hazards, further from the public eye. Though all companies, public or private, must follow environmental regulations, private firms are exempt from many public financial disclosure rules. As a result, some of the country’s largest emitters of methane, a particularly potent planet-warming gas, are oil and gas producers backed by relatively little-known investment firms. In 2017, Hilcorp, a private company backed by the private equity giant Carlyle, bought oil major ConocoPhillips’ San Juan Basin assets in Colorado and New Mexico for $3 billion, and last year bought all of BP’s Alaska operations and interest for $5.6 billion. Hilcorp is now the country’s largest known emitter of methane, reporting almost 50 percent more emissions from its operations than the nation’s largest fossil fuel producer, Exxon Mobil, despite only producing about a third of Exxon’s oil and gas volume. Hilcorp, Carlyle and ConocoPhillips did not provide comment. David McNeil, head of climate risk at Fitch Ratings, wrote in a memo earlier this year that there is a growing trend among publicly traded companies and investors to divest from fossil-fuel or other holdings that contribute to climate change, but “comparatively little focus is on who purchases these assets,” and private equity firms, in particular, “will generally have fewer incentives to reduce emissions than their public counterparts.” At the height of the pandemic, dozens of private equity-backed oil and gas producers filed for bankruptcy, raising concerns that they would use the restructuring process to evade cleanup rules. Now, as oil and gas prices surge again, private shale drilling and fracking are leading a rebound in oil and gas drilling. “Any private equity fund is obsessed with one thing, and one thing only: How much money can we make in any given investment?” said Ludovic Phalippou, professor of financial economics at University of Oxford’s Saïd Business School. “And when these largely anonymous firms collapse, you don’t even know who to be angry at, because you don’t even know who they are.”

#### AND that’s equally enforced against foreign investors.

Capobianco 2009 Antonio Capobianco, OECD Competition Division, holds post graduate degrees from the New York University School of Law (LL.M. in Trade Regulation and Antitrust) and from the Institute of European Studies of the Université Libre de Bruxelles, January 2009, “Competition Law and Foreign-Government Controlled Investors”https://www.oecd.org/daf/inv/investment-policy/41976200.pdf

Direct investments in the form of mergers and acquisitions are most likely to fall within those situations which are subject to antitrust review competition authorities. This is also the case for green-field investments which are subject to notification to competition agencies (subject to the fulfilment of merger filing requirements) even if they raise no competition issue. The status of the foreign government-controlled investors engaging in these foreign investments could be of several types: state-owned enterprises (SOEs), pension funds or other government-controlled entities such Sovereign Wealth Funds (SWFs). The exact nature of a foreign government-controlled investor, its public policy mission and the links with its government are matters of interest to competition officials, both for their impact on competition and for determining their status with respect to enforcement actions. These characteristics will interact with recipient country competition laws in complex ways to determine whether and which actions might be taken by competition authorities. These questions – the market effects and of legal status of different types of government controlled investors – are complex issues in competition policy and could benefit from further analysis. 7. As summarised in the background material prepared by the Secretariat for this discussion, foreign government-controlled investments can raise a number of concerns in the recipient country: some concerns are competition related, some are related to national security considerations, some are related to foreign governments’ immunity from domestic law enforcement; others finally are more political in nature. My remarks will focus on the competition-related concerns that may arise from direct investments by foreign government-controlled entities. 8. When it comes to the direct investments of foreign government-controlled companies, merger control rules place competition agencies at the centre of the review of the antirust impact of M&A activities, including investments by foreign government-controlled entities. Here, many countries make a distinction between (i) the acquisition of controlling interests and (ii) the acquisition of non-controlling interests (or minority shareholdings). 5 II.1 Acquisitions of controlling interests 9. In all OECD member countries, large investments which allow the investor to acquire a controlling share in a company must be approved by the competition authority ex-ante, so that a successful approval process becomes a condition for the deal. Without going into the details of how merger control works, I would only like to note that:  In most OECD countries merger control rules are ownership neutral and equally apply to private as well as state-controlled investors. When states or state-controlled entities operate in the marketplace as commercial operators, their activities are not immune from merger enforcement. Acquisitions by foreign government-controlled entities are routinely subject to merger review.  The purpose of merger control is to identify and investigate competition-related concerns arising from M&A activities. Competition concerns may arise if a transaction is expected to increase market power resulting in higher prices (or in lower quality or less choice) for consumers (unilateral effects); or if the transaction changes the nature of competition in such a way that firms will be significantly more likely to coordinate and raise prices or otherwise harm effective competition after the merger in terms of lower product quality or less innovation (coordinated effects).  Should any of these concerns be identified, the competition authority can block the transaction unless the parties can offer sufficient remedies to the competition concerns. 10. An interesting question is how the competition enforcement community deals with multijurisdictional effects of these transactions, since review processes remain largely national. This is a general issue raised by globalisation: markets and companies are going global but competition agencies’ enforcement powers are generally limited to their respective jurisdictions. The antitrust enforcement community addresses this issue in two ways: parallel enforcement of competition rules and international cooperation. It is common nowadays to see the same deal investigated by a number of competition agencies at the same time, each reviewing the effects on competition in their own country. The major antitrust agencies have entered into bilateral cooperation and assistance agreements, which allow them to coordinate their enforcement actions across-jurisdictions. In addition, in 1995 the OECD has adopted a Recommendation on international antitrust cooperation, which offers a platform for comity considerations where no specific bilateral or multilateral agreement is in place. The system is not perfect or the most efficient one, as there may still be risks of duplication, inconsistencies and over regulation. However, it has proved effective and competition officials are making efforts to enhance international cooperation. II.2. Acquisitions of non-controlling interests 11. Acquisitions of non-controlling interests raise interesting issues as they may raise competition concerns, which in some OECD jurisdictions competition authorities are not in a position to address effectively. 12. One might find it hard to understand, at first glance, why non-controlling equity investments should be controversial, even if the investor is a foreign government-controlled entity. However, there is extensive literature on the effects of minority shareholdings between competing companies which shows that, in some circumstances, 1 minority shareholdings can have negative effects on competition, either by reducing the minority shareholder's incentives to compete (unilateral effects), or by facilitating collusion (coordinated effects). By acquiring a share in a competitor the incentives to compete may be reduced. If a firm owns equity in a competitor, the financial losses incurred by the competitor will affect the value of the firm's investment. In this scenario, the firm may have less incentive to compete against the company it has invested in. In addition, if the minority stake gives rise to representation rights (e.g. the right to appoint a member of the board) then the investor may be given access to sensitive information about the target company that could be used to collude. 13. As in the case of acquisitions of controlling stakes, merger rules are the most frequently used tool to examine the competitive effects of acquisitions of minority shareholdings. However, the system is not without loopholes. In merger regimes that use the concept of "control" to define a reviewable transaction (for example the EU and most European countries), acquisitions of non-controlling stakes can be reviewed only if they result in a “change of control”. This may create an enforcement gap with respect to minority shareholdings that do not affect control but may nevertheless have negative effects on competition. Other jurisdictions (such as the United States, the United Kingdom and, to some extent, Germany) have a wider jurisdictional net and can review acquisitions of non-controlling stakes under a “material influence” or similar standard, or can review all acquisitions of an interest in another company under their merger review regimes. 14. Does this mean that potential anti-competitive effects of acquisitions by foreign government-controlled entities of non-controlling stakes can in some OECD jurisdictions fall short of any antitrust review? The short answer is no, although reviewing the effects on competition of these transactions can be more complex and ultimately remedies less effective. Competition law provisions concerning restrictive agreements and unilateral conduct can also be applied to review the competitive effects of minority shareholdings. However, there are important differences in so far as:  Merger control allows antitrust review and intervention ex-ante, preventing anti-competitive effects from arising in the first place, while rules on anti-competitive agreements and abuse of dominance can only be applied ex-post; and  The application of cartels and dominance rules may not be straightforward in these cases. The application of rules on restrictive agreements has limited reach because they apply only if an "agreement" and anticompetitive effects can be established. In a similar way, rules on unilateral conduct require the agency to show substantial market power and unlawful conduct. For these reasons, some countries have considered or are considering (e.g. EU and Ireland) amending their merger statutes to provide more effective enforcement in all circumstances.

#### Pivoting capital towards sustainability is key---prohibitions create a positive feedback loop

Lozo and Strinati 2020 (Sandra Lozo, Renewable Energy Finance professional @ IRENA (International Renewable Energy Agency), and Costanza Strinati, certified expert in Climate, Renewable Energy and Sustainable Finance with the Frankfurt School of Finance and Management and holds a Master’s degree in Economics and Management of Innovation and Technology from Bocconi University in Milan, November 2020 “Mobilising institutional capital for renewable energy” IRENA, https://www.irena.org/publications/2020/Nov/Mobilising-institutional-capital-for-renewable-energy)

2.3. Why raise institutional capital for renewables? Because of the sheer size of their balance sheets, institutional investors clearly have a fundamental role to play in allocating global capital to sustainable economic sectors. As we have seen, this potential is largely unrealised when it comes to renewables. Activating the institutional capital pool in emerging and developing markets is particularly important for the purpose of financing the growing demand for green power and infrastructure to fuel sustainable economic development. Greater institutional investments in renewable energy can create a positive feedback loop by increasing the low-cost capital invested in the sector. This would reduce financing costs for the sector as a whole, thus helping to attract other sources of capital. For institutional investors, rising investment in renewables offers appealing opportunities while promising to lower the risks presented by certain growing threats. Several studies have shown that the main drivers of investment in renewable energy by institutional investors are economic – stable longterm cash flows and portfolio diversification – with sustainability and ethical standards ranking low on their agenda (Aquila Capital, 2019; Schroders, 2019). However, the growing social and regulatory scrutiny of institutional investors’ actions is likely to affect their priorities. Similarly, the likelihood of financial losses from unmitigated exposure to climate change looms large, while the investment case for renewable energy is already strong and becoming more so each year, as costs fall, technologies are perfected, and sector stakeholders gain experience. Institutional capital is needed to meet climate targets and green infrastructure needs An energy transition that meets global climate targets set out in the 2015 Paris Agreement requires a massive reallocation of capital toward renewables, energy efficiency, electrification and the associated energy infrastructure. Because the amount required is USD 15 trillion more than the levels set out in current and planned policies (IRENA, 2020c), the institutional capital pool is simply too large and too important to remain on the sidelines of the energy transformation.

**Climate change is a system disruptor and a risk amplifier---only mitigation prevents biodiversity loss, marine ecosystem collapse, resource wars, global food scarcity, and extreme weather events. Uniquely—has disparate impacts.**

**Pachauri & Meyer 15** (Rajendra K. Pachauri Chairman of the IPCC, Leo Meyer Head, Technical Support Unit IPCC were the editors for this IPCC report, “Climate Change 2014 Synthesis Report” <http://epic.awi.de/37530/1/IPCC_AR5_SYR_Final.pdf> IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp)

SPM 2.3 Future risks and impacts caused by a changing climate

Climate change will **amplify existing risks** and **create new risks for natural and human systems**. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. {2.3}

Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems, including their ability to adapt. Rising rates and **magnitudes of warming** and other changes in the climate system, **accompanied by ocean acidification**, increase the risk of severe, pervasive and in some cases irreversible detrimental impacts. Some risks are particularly relevant for individual regions (Figure SPM.8), while others are global. The overall risks of future climate change impacts can be reduced by **limiting the rate and magnitude of climate change**, including ocean acidification. The precise levels of climate change sufficient to trigger abrupt and irreversible change remain uncertain, but the risk associated with **crossing such thresholds increases with rising temperature** (medium confidence). For risk assessment, it is important to evaluate the **widest possible range of impacts**, including low-probability outcomes with large consequences. {1.5, 2.3, 2.4, 3.3, Box Introduction.1, Box 2.3, Box 2.4}

A large fraction of species faces **increased extinction risk** due to climate change during and beyond the 21st century, especially as climate change interacts with other stressors (high confidence). Most plant species cannot naturally shift their geographical ranges sufficiently fast to keep up with current and high projected rates of climate change in most landscapes; most small mammals and freshwater molluscs will not be able to keep up at the rates projected under RCP4.5 and above in flat landscapes in this century (high confidence). Future risk is indicated to be high by the observation that natural global climate change at rates lower than current anthropogenic climate change caused significant ecosystem shifts and species extinctions during the past millions of years. **Marine organisms will face progressively low**er **oxygen levels** and high rates and magnitudes of ocean acidification (high confidence), with associated risks exacerbated by rising ocean temperature extremes (medium confidence). **Coral reefs and polar ecosystems are highly vulnerable**. Coastal systems and low-lying areas are at risk from sea level rise, which will continue for centuries even if the global mean temperature is stabilized (high confidence). {2.3, 2.4, Figure 2.5}

Climate change is projected to undermine food security (Figure SPM.9). Due to projected climate change by the mid-21st century and beyond, global marine species redistribution and marine biodiversity reduction in sensitive regions will **challenge the sustained provision of fisheries** productivity and other ecosystem services (high confidence). For wheat, rice and maize in tropical and temperate regions, climate change without adaptation is projected to negatively impact production for local temperature increases of 2°C or more above late 20th century levels, although individual locations may benefit (medium confidence). Global temperature increases of ~4°C or more 13 above late 20th century levels, combined with increasing food demand, would pose large risks to **food security globally** (high confidence). Climate change is projected to reduce renewable **surface water and groundwater resources** in most dry subtropical regions (robust evidence, high agreement), **intensifying competition for water among sectors** (limited evidence, medium agreement). {2.3.1, 2.3.2}

Until mid-century, projected climate change will impact human health mainly by exacerbating health problems that already exist (very high confidence). Throughout the 21st century, climate change is expected to lead to **increases in ill-health** in many regions and especially in developing countries with low income, as compared to a baseline without climate change (high confidence). By 2100 for RCP8.5, the combination of high temperature and humidity in some areas for parts of the year is expected to compromise common human activities, including growing food and working outdoors (high confidence). {2.3.2}

In urban areas climate change is projected to increase risks for people, assets, economies and ecosystems, including risks from **heat stress**, **storms** and **extreme precipitation**, **inland and coastal flooding,** **landslides**, **air pollution**, **drought**, **water scarcity**, **sea level rise** and storm surges (very high confidence). These risks are amplified for those lacking essential infrastructure and services or living in exposed areas. {2.3.2}

Rural areas are expected to experience major impacts on water availability and supply, food security, infrastructure and agricultural incomes, including shifts in the production areas of food and non-food crops around the world (high confidence). {2.3.2}

**Aggregate economic losses accelerate with increasing temperature** (limited evidence, high agreement), but global economic impacts from climate change are currently difficult to estimate. From a poverty perspective, **climate change impacts are projected to slow down economic growth**, make poverty reduction more difficult, further erode food security and prolong **existing and create new poverty traps**, the latter particularly in urban areas and emerging hotspots of hunger (medium confidence). International dimensions such as trade and relations among states are also important for understanding the risks of climate change at regional scales. {2.3.2}

Climate change is projected to increase displacement of people (medium evidence, high agreement). Populations that lack the resources for planned migration experience higher exposure to extreme weather events, particularly in developing countries with low income. **Climate change can indirectly increase risks of violent conflicts** by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (medium confidence). {2.3.2}

#### Federal action against leasing and extraction is the only mechanism capable of destroying the fossil fuel industry– any other actor doesn’t have the force to leave carbon in the ground

Parenti ’14 (Christian Parenti, former visiting fellow at CUNY's Center for Place, Culture and Politics, as well as a Soros Senior Justice Fellow, teaches in the Liberal Studies program at New York University, “Force Big Government to Kill Big Carbon,” 21 February 2015, <http://www.huffingtonpost.com/christian-parenti/force-big-government-to-k_b_6368962.html)> \*edited for ableist language

The climate movement tends to talk about “theories of change” rather than “theories of power.” But if you think about power — who has it, what are its mechanisms, how can it be used — then government looms large. Government is more than one-third of the economy; its judicial and regulatory apparatus touches everything; the private sector depends almost entirely on the infrastructure of the public sector; and during times of crisis the state is private industry’s life-support system. When pondering mechanisms that the climate movement might use to maximize its impact in the short time still available, consider this: The federal government could, without any new laws, significantly restrict both the supply of, and demand for, fossil fuels. In other words, if the climate movement is serious about controlling Big Carbon it needs to get serious about Big Government. Only the state has the power to end ~~euthanize~~ the fossil fuel industry. Divestment and marching are good and important tactics; they demonstrate popular power but that power needs to be brought to bear on mechanisms — like government regulation — that can directly control the fossil fuel industry. The federal government could restrict demand for fossil fuel by making it expensive, and it could do that by implementing legally mandated, strict EPA regulations on greenhouse gas emissions under the Clean Air Act. Polluters would have to pay heavy fines and that would raise the cost of dirty energy. As for supply, the government could start by taking its own fossil fuel reserves off the market. The time is right to press on both mechanisms, but neither will happen unless green activists demand robust federal action. Good news: that’s starting to happen. Obama may have even cracked opened a door that the movement can push further. He has said, “We’re not going to be able to burn it all.” And his mildly ambitious though inadequate emissions reduction agreement with China, will be implemented (if at all) through enforcement of existing laws, most importantly, the Clean Air Act as interpreted by the 2007 Supreme Court ruling in Massachusetts v EPA. If aggressively applied the Clean Air Act could severely restrict the demand for fossil fuels across the entire energy and transportation sectors. Less discussed is government control of the fossil fuel reserves beneath public lands. Shockingly — if you consider the climate science — federally owned coal, oil and gas reserves account for more than one-quarter of all fossil fuel production in the U.S. (That is down from public property sourcing about a third of all production just prior to the fracking boom on private lands.) Control of these massive reserves lies with the president — he could start pulling public fossil fuel reserves from the market now, without congressional approval. Mass v EPA How did the EPA get this climate specific power? The story goes back to 1997 when President Clinton signed the Kyoto protocol, an international agreement to cut greenhouse gas emissions, but the Senate never ratified the treaty, and President Bush subsequently renounced it. In response, Massachusetts, several other states, and various green groups all sued the EPA in 2003. The plaintiffs argued that the federal government was obliged to use the Clean Air Act of 1970 to regulate greenhouse gas emissions. In 2007, the Supreme Court finally ruled. Yes, the EPA was legally bound to use the Clean Air Act to regulate GHG emissions. At the time it was estimated that the new regulations could achieve a 40 percent reduction of U.S. Carbon emissions over 1990 levels by 2020. Then came years of deliberate inaction and foot-dragging by two administrations. Now the Agency is finally starting to promulgate the specific GHG rules required by Mass v EPA. The two regulations issued thus far have been politically easy: a federal standard for passenger vehicles, which was largely redundant with already existing state regulations; and restrictions on new coal-fired plants which were not actually going to be built because of a glut of cheap fracked gas. More importantly, the EPA is currently crafting rules for existing power plants. The Agency took comment all summer and fall and will issue the new rules in June 2015. A number of large green groups mobilized members to comment at EPA hearings, and an impressive 8 million public comments were logged. But, with the exception of a few small and midsized groups such as the Center for Biological Diversity, most of the green groups did not demand that these new rules be science-based, i.e. much tighter than those on offer. And the effort has been strangely low profile; there is no robust campaign of popular education, mass mobilization, protest, or direct action aimed at the EPA. There was very little, if any, mention of the Agency among the signs, chants and media comments at the otherwise wonderful and massive Peoples Climate March. Alas, many of the youth and high-profile troublemakers in the movement too often write government off as “broken” and deliberately turn away from even trying to understand it. (I realize government is not “sexy” or simple, but to deliberately turn away from it courts disaster.) Industry, on the other hand, takes government and the EPA very seriously. Their fear of the Agency has been expressed in a 15-year long crusade against it. The offensive began in 1999 when the American Petroleum Institute, the trade association of Big Carbon, called an anti-EPA war council attended by players from: aluminum, petrochemicals, electric power, aerospace, airlines, the National Association of Manufacturers, and the Chamber of Commerce. This mob has been fighting the EPA ever since. As a result, the EPA is feeling much more pressure from industry than it is from the climate movement. This is unfortunate. As shown by the successful defense of USDA organics standards a decade ago, the so-far-successful mobilization to defend net neutrality, and the fight against the as-yet-not approved Keystone XL pipeline, citizen campaigns can positively shape government regulations. Other EPA rules that the climate movement should get ready to try and shape include those regulating oil refining, the cement industry, paper, chemical and fertilizer production, air, rail, and shipping. Government-Owned Fossil Fuels. Another important point of leverage is the federal government’s direct control over the supply of fossil fuels. According to the U.S. Energy Information Agency, 26.4 percent of total U.S. fossil fuel production is sourced from federal and tribal lands. That means about a quarter of all U.S. greenhouse gas emissions originated as publicly owned fossil fuel reserves. According to Stratus Consulting, these government owned fuels produce annual greenhouse gas emissions equal to 283 million passenger vehicles. Since 1982, the federal government has, according to the Environmental Working Group, “leased or offered for oil and gas drilling 229 million acres of public and private land in 12 western states.” Worse yet, most of these reserves aren’t even sold at a decent price. A report by Oil Change International estimates the U.S. Government loses $2.2 billion a year due to low royalties on public reserves; that’s 10 percent of the $22 billion annual subsidy the U.S. Government gives to the petroleum industry. Translation: the federal government owns vast amounts of fossil fuels and if we are serious about not burning all existing hydrocarbon reserves, that is the most feasible place to start. Unlike Exxon Mobil the government is, at least in theory, a publicly accountable institution. Even as a lame duck president — or especially so as he is not worried about re-election — Obama could be forced to use his power to severely limit the amount of fossil fuels produced on our public lands. Like EPA enforcement of the Clean Air Act, aggressive presidential action on this front does not require approval from Congress. If pressured by a movement, Obama could do several things. First, he could direct the secretary of the interior, Sally Jewell, to issue a Secretarial Order banning all further petroleum leasing until there is a federal energy strategy that takes into account the climate consequences of fossil fuel combustion. Though the Interior Department is tasked with making public resources available for private exploration, it also has the well-established power to pull lands from development “in order to maintain other public values.” Protecting the climate would fit the definition of a “public value.” Imagine putting a quarter, to one third, of all known U.S. fossil fuel reserves beyond the reach of Big Carbon. The economic and ideological impact would be tremendous; among other things this would send an important message to the rest of the world. Lest that sound impossible, the Obama administration has done this sort of thing already. The previous secretary of the interior, Ken Salazar, withdrew one million acres of land around the Grand Canyon from possible uranium mining. The “other public values” he cited as justification included pollution risks to waterways and public health. (Alas, Obama usually does the opposite. In 2013, the Administration, via the Interior Department’s Bureau of Land Management, offered up 5.7 million acres for lease to industry. The Interior Department also sped up the permitting process for drilling and opened an additional 59 million acres for oil and gas drilling offshore in the Gulf of Mexico. And, the BLM approved more than 800,000 acres for extra-filthy tar sands and oil shale development in the Green River Formation, a vast stretch of terrain in Utah, Wyoming and Colorado that contains 2 to 7 times more energy and pollution than the Alberta Tar Sands. All very, very bad.) A second, more difficult action would be to cancel existing leases whenever there can be found sufficient technical, financial, or environmental problems. Under the Mineral Leasing Act any non-producing lease can be cancelled automatically when the lessee violates the law, regulations, or lease terms. The Interior Department could be instructed to search for such violations and cancel leases accordingly. The third thing Obama could do is go after producing leases, which can be cancelled for violations of law, regulation, or lease terms, but only after a judicial proceeding. That would be more difficult, but not impossible. As Taylor McKinnon of the Center for Biological Diversity put it: “Averting the worst global warming means leaving most proved fossil fuel reserves in the ground. If the world is going to act, Obama will need to lead, and that leadership should start on U.S. public lands. He has the legal authority — does he have the political will?” Obviously, he does not. But, like other presidents before him who have faced mass and disruptive protest, he could be forced to acquire it. How to Attack Clearly, the Obama administration will not use its control of public lands and the Clean Air Act unless hounded, harassed, and humiliated into doing so. How might activists intervene to shape these processes? That has to be worked out in practice. Thankfully we have examples. Tim deChristopher struck directly at the misuse of public lands when he sabotaged a BLM petroleum lease auction. Ingeniously, deChristopher just joined the bidding, out-bid the companies, and then refused to pay. Valiantly, the price deChristopher paid for calling attention to the BLM’s disgusting, reckless, profligate, totally insane folly was two years in prison. But, in proof that direct action gets the goods, then secretary of the Interior, Ken Salazar, soon canceled many of the worst Bush-era oil and gas leases — including the patch deChristopher bid on. If there is one thing we know about Obama it is that he is vain, wants to be loved by everyone, and absolutely hates criticism from the left. Perhaps that’s why he seems to respond to it. Consider the fact that he is all but publicly committed to vetoing the Keystone XL pipeline. Clearly, the president did not like having Michael Brune, Bill McKibben, and scores of other high profile figures arrested at the end of his driveway anymore than he like tens of thousands of activists — many of them veterans of the 2008 Obama canvas — condemning him personally for selling out his daughters’ futures. Nor does he like many young activists who use nonviolent direct action against Big Carbon’s extraction and transportation operations. One suspects the equally self-regarding Sally Jewell, current Secretary of the Interior and former REI executive, is similarly sensitive. Government gets such a bad rap that many on the Left overlook the good it does. But history is full of examples of state power serving as a progressive force and crystallizing left victories. It was not just the tenacity of CIO organizers against the bosses that led to the massive boom in union density during the 1930s and 1940s, the Wagner Act helped catalyze their power. Nor did the white power structure of the Jim Crow South ever relent, change its mind, say it was sorry, or in anyway not pursue it’s agenda of racist segregation. But it was eventually forced to restore the vote to southern African-Americans by way of Federal laws and troops, which were forced to intervene by the Civil Rights Movement. When Act Up demanded AIDS research, they did not just target the medical industry, they also had a direct action campaign targeting the regulators of that industry, the USDA. From those efforts came an HIV treatment protocol. (For details check out the excellent documentary How to Survive a Plague.) Or, more directly connected to the climate issue, recall the improbable origins of the EPA and the Clean Air Act, both signed into law by rightwing Richard Nixon; his hand forced by the massive protests of Earth Day, and all the other movements of that era. Today is different, but not entirely. There are signs that the climate movement is thinking of creative ways to pressure government to lead on climate. Litigation by the Sierra Club and the Center for Biological Diversity has blocked all new public lands lease sales in California for over two years, and Friends of the Earth just filed a lawsuit demanding a halt to all leasing of U.S. government-owned coal. The Center is planning an advocacy and protest campaign around both the EPA and leasing on public lands to start early in 2015. The climate science is very clear: We do not have many years left to avoid the worst of runaway climate change, the movement’s ultimate short to medium term goal must be closing the fossil fuel industry. What force, what mechanisms, which institutions could actually do this? Does anyone really imagine that the fossil fuel industry can be convinced to change by way of smart arguments, or shamed out of existence, or tricked into believing there is a carbon bubble by way of spin and headlines, or even starved of investment capital? Let’s be as radical as reality itself. Ultimately, only Big Government, (if forced to by the people) will be strong enough to subdue and euthanize Big Carbon.

#### Carbon tax makes thorium reactors commercially viable

Greenstone 2019 (Michael Greenstone, Milton Friedman Distinguished Service Professor in Economics at the University of Chicago's College and Harris School of Public Policy and director of its Energy Policy Institute, 1-7-2019, "Nuclear energy could be competitive, but it requires pricing carbon," Axios, <https://www.axios.com/nuclear-energy-could-be-competitive-but-it-requires-pricing-carbon-78fd8c75-a534-4baa-a12b-452e8ce17c9c.html>)

A picture containing table

Description automatically generatedSix U.S. nuclear plants have closed in the past five years and nearly 35% of the remaining fleet are now at risk of early closure or slated to retire. The big picture: Many tout carbon-free nuclear energy as a climate solution, but today’s nuclear plants are having a difficult time competing with cheap natural gas and renewables in today’s wholesale electricity markets. New advanced nuclear technologies may reduce costs, but even in the most optimistic scenarios they will not be competitive without a price on carbon. Though they remain largely untested, advanced technologies could prove cheaper and safer than current reactors: Small modular reactors (SMRs) are compact and require less on-site construction. Generation IV reactors don’t require elaborate external cooling systems like the ones that failed at Fukushima. Liquid-sodium cooled reactors can use spent uranium and plutonium, allowing them to produce power for extended periods without costly refueling. Yes, but: Thanks to the fracking boom, nuclear technologies will face stiff competition from natural gas combined cycle (NGCC) power plants for decades, as well as from renewables due to their decreasing costs. Unless fossil fuel plants pay a price for climate-damaging carbon emissions, carbon-free technologies like nuclear energy will likely continue to lose market share or require subsidies. What to watch: The above chart compares the expected range of costs for producing a megawatt hour (MWh) of electricity from advanced nuclear technologies in 2040 to the projected cost of NGCC plants — both with and without a carbon price of roughly $50 per ton of emissions, as used by the Obama administration. Without a carbon price, there is no advanced nuclear technology that is projected to be competitive with a NGCC plant. However, with a modest carbon price in place, cost projections for all three advanced nuclear technologies suggest they could be competitive with NGCC plants, with SMRs and High-Temperature Generation IV plants particularly close. The bottom line: The capital investments that increase the odds of innovation depend on market signals. To plan on a nuclear renaissance without a price on carbon is to treat hope as a strategy.

#### Thorium tech is ready and solves existing nuclear waste---avoids all Ks of nuclear tech.

Servan-Schreiber 2018 (Franklin Servan-Schreiber, Carnegie Mellon BS in engineering and MS in comparative history, 11-16-2018, "Destroying nuclear waste to create clean energy? It can be done," World Economic Forum, https://www.weforum.org/agenda/2018/11/destroying-nuclear-waste-to-create-clean-energy-it-can-be-done/)

If not for long-term radioactive waste, then nuclear power would be the ultimate “green” energy. The alternative to uranium is thorium, a radioactive ore whose natural decay is responsible for half of our geothermal energy, which we think of as “green energy.” More than 20 years of research at the European Centre for Nuclear Research (CERN), the birthplace of the internet and where Higgs boson was discovered, demonstrate that thorium could become a radically disruptive source of clean energy providing bountiful electricity any place and at any time. Coal and gas remain by far the largest sources of electricity worldwide, threatening our climate equilibrium. Non-fossil alternatives, such as solar power, use up a forbidding amount of land, even in sunny California, plus the decommissioning will pose a serious recycling challenge within 20 years. Solar is best used on an individual household basis, rather than centralized plants. Wind requires an even larger surface area than solar. As Michael Shellenberger, a Time magazine “Hero of the Environment”, recently wrote: “Had California and Germany invested $680 billion into nuclear power plants instead of renewables like solar and wind farms, the two would already be generating 100% or more of their electricity from clean energy sources.” Correct, but the disturbing issue of long-term nuclear waste produced by conventional, uranium based, nuclear plants still remains. In the early 1990s, Carlo Rubbia, Nobel prize winner in physics (1984) and then CERN’s director general, launched a small experiment applying cutting-edge accelerator technologies toward energy production. The First Energy Amplifier Test (FEAT), funded by the European Commission, successfully demonstrated the principles of a clean and inherently safe process of energy production, based on widely available thorium. Since then, numerous experiments have demonstrated the feasibility of a large scale-up for industrial use. They also demonstrated that existing long-term (240,000 years or more) nuclear waste can be “burned up” in the thorium reactor to become a much more manageable short-term (less than 500 years) nuclear waste. An Accelerator-Driven System (ADS), as the process is called, comprises an assembly of key technologies developed at CERN: an accelerated proton beam focuses on a metal target, usually lead, in a process called spallation. This spawns neutrons that in turn convert thorium into fissile uranium233, producing heat by way of nuclear fission. The heavy uranium233 nuclei divides into smaller nucleus such as zirconium (think Shopping Channel jewellery) or xenon (used in camera flash bulbs), with only minimal radioactive waste produced. An Accelerator Driven System (ADS) for clean electricity, based on 20 years of research at CERN. The advantages of an ADS over other energy production process are many: Clean: No emissions are produced (CO2, nitrogen or sulphur oxides particles, among others), unlike with fossil fuel. Heat is generated from the transmutation of thorium into the highly radioactive uranium233 and its subsequent fission into smaller particles. Feasible: ADS technology development has been proven to be a bounded problem with a realistic development timeline. In comparison, fusion is an unbounded problem that does not have a constrained development timeline. Transmutation of nuclear waste: the ADS process has been proven to transmute long-term nuclear waste, harmful for 240,000 years or more, into short-term radioactivity waste of less than 500 years toxicity. The technology would solve the intractable problem of very long-term radioactive waste storage. No military usage: The International Atomic Energy Agency has repeatedly stated that the technology is “intrinsically proliferation resistant.” Large thorium reserves: enough for 20 centuries at 2018 level of global electricity consumption. Thorium is well distributed around the globe, with no nation having a monopoly. High energy density: 1 tonne of thorium would provide the energy equivalent of 3 million tonnes of coal, or 200 tonnes of natural uranium enriched for use in a nuclear reactor. Inherent safety: the process operates at atmospheric pressure therefore the plant can’t explode (unlike Chernobyl). The reaction is also stops immediately when the proton beam is interrupted, providing inherent safety. Smart grid friendly: Immediate ON/OFF capability would make ADS power plants ideal for base load energy production for smart grids. Small footprint: A 500MW ADS plant would only be as large as a mediumsize factory, compared to 26 km2 (10 mi2) for the 550MW Topaz solar farm in the sunny California desert. In the wintery north-west, an equivalent solar farm would be almost three times larger, approximately 62 km2. Wind turbines require even more space. Proximity: inherent safety and small size make ADS ideally suited for any use, industrial or urban, and able to be located in remote regions, including high latitudes with little sunshine.

#### That solves all problems with conventional nuclear power

Sameer Surampalli 19, BS in Electronics and Electrical Engineering from the University of Missouri-Columbia, Senior Interconnection Project Engineer at AES Clean Energy, 8/13/2019, “Is Thorium the Fuel of the Future to Revitalize Nuclear?” https://www.power-eng.com/nuclear/reactors/is-thorium-the-fuel-of-the-future-to-revitalize-nuclear/#gref

Nuclear energy produces carbon-free electricity, and the United States has used nuclear energy for decades to generate baseline power.

Nuclear energy, however, carries a dreaded stigma. After disasters such as Chernobyl, Three Mile Island, and Fukishima, the public is acutely aware of the potential, though misguided, dangers of nuclear energy. The cost of nuclear generation is on the rise—a stark contrast to the decreasing costs of alternative energy forms such as solar and wind, which have gained an immense amount of popularity recently.

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This trend could continue until market forces make nuclear technology obsolete. Into this dynamic comes a resurgence in nuclear technology: liquid fluoride thorium reactors, or LFTRs (“lifters”). A LFTR is a type of molten salt reactor, significantly safer than a typical nuclear reactor. LFTRs use a combination of thorium (a common element widely found in the earth) and fluoride salts to power a reactor.

A typical arrangement for a modern thorium-based reactor resembles a conventional reactor, albeit with notable differences. First, thorium-232 and uranium-233 are added to fluoride salts in the reactor core. As fission occurs, heat and neutrons are released from the core and absorbed by the surrounding salt. This creates a uranium-233 isotope, as the thorium-232 takes on an additional neutron. The salt melts into a molten state, which runs a heat exchanger, heating an inert gas such as helium, which drives a turbine to generate electricity. The radiated salt flows into a post-processing plant, which separates the uranium from the salt. The uranium is then sent back to the core to start the fission process again.

Thorium reactors generate significantly less radioactive waste, and can re-use separated uranium, making the reactor self-sufficient once started. LFTRs are designed to operate as a low-pressure system unlike traditional high-pressure nuclear systems, which creates a safer working environments for workers who operate and maintain these systems. Additionally, the fluoride salts have very high boiling points, meaning even a large spike in heat will not cause a massive increase in pressure.

Both of these factors greatly limit the chance of a containment explosion. LFTRs don’t require massive cooling, meaning they can be placed anywhere and can be air-cooled. If the core were to go critical, gravity would allow the heated, radiated salt to spill into passive via underground fail-safe containment chambers, capped by an ice plug that melts upon contact.

LFTRs provide numerous benefits. Any leftover radioactive waste cannot be used to create weaponry. The fuel cost is significantly lower than a solid-fuel reactor. The salts cost roughly $150/kg, and thorium costs about $30/kg.

If thorium becomes popular, this cost will only decrease as thorium is widely available anywhere in the earth’s crust. Thorium is found in a concentration over 500 times greater than fissile uranium-235. Historically, thorium was tossed aside as a byproduct of rare-earth metal mining. With extraction, enough thorium could be obtained to power LFTRs for thousands of years. For a 1 GW facility, material cost for fuel would be around $5 million. Since LFTRs use thorium in its natural state, no expensive fuel enrichment processes or fabrication for solid fuel rods are required, meaning the fuel costs are significantly lower than a comparable solid-fuel reactor. In an ideally working reactor, the post chemical reprocessing would allow a LFTR to efficiently consume nearly all of its fuel, leaving little waste or byproduct unlike a conventional reactor. Lastly, a thorium plant will operate at about 45 percent thermal efficiency, with upcoming turbine cycles possibly improving the overall efficiency to 50 percent or greater, meaning a thorium plant can be up to 20 percent more efficient than a traditional light-water reactor.

#### Default to consequentialism

Sikkink 8, Professor of political science at the University of Minnesota (Kathryn Sikkink, 2008, “The Role of Consequences, Comparison, and Counterfactuals in Constructivist Ethical Thought,” <http://www.polisci.umn.edu/centers/theory/pdf/sikkink.pdf)>

Ethical arguments of these different types are ubiquitous and necessary. But because they are also slippery and open to manipulation and misuse, we also need to be very careful and precise about how we go about using them. I would recommend that first we distinguish very carefully between the comparison to ideals and historical empirical comparison. I believe that many critical constructivist accounts rely on the comparison to the ideal or to the conditions of possibility counterfactual argument. In almost every critical constructivist work there is an implicit ideal ethical argument. This argument is implicit because it is rarely clearly stated, but it is found in the nature of the 36 critique. So, for example, in her discussion of U.S. human rights policy, Roxanne Doty critiques a human rights policy carried out by actors who sometimes use it for their own self aggrandizement and to denigrate others. 42 The implicit ideal this presents is a human rights policy that is not used for denigration or surveillance or othering those it criticizes or conversely, of elevating those who advocate it. What would be examples of such a policy? The book does not provide examples. We do not know if examples exist in the world. So the implicit comparison is a comparison to an ideal – a never fully stated ideal, but one present in the critique of what is wrong with the policies discussed. Nicolas Guilhot makes a similar argument in his recent book. The promotion of democracy and human rights, he argues, are increasingly used in order to extend the power they were meant to limit. “The promotion of democracy and human rights defines new forms of administration on a global scale and generates a new political science.” He historically examines how progressive movements for democracy and human rights have become hegemonic because they “systematically managed to integrate emancipatory and progressive forces in the construction of imperial policies.” But once again, the book offers no alternative political scenario. In the final sentence of the book, the author clarifies that “this book has no other ambition than to contribute to the democratic critique of democracy.” 43 In the introduction, he clarifies, “This book does not provide answers to these dilemmas. At most, its only ambition is to highlight them, in the hope that a proper understanding constitutes a first step toward the invention of new courses of action.”44 Ethically, I believe this is a cop-out. Politically and intellectually, I find it too comfortable and too easy. This critique has a crucial role to play in pointing to hypocrisy (as Price highlights in the introduction). It could also serve as a catalyst for policy change in the direction of policy that would include less surveillance or less cooptation of human rights discourse. But it is unlikely to serve as a catalyst for new action or policy change unless it ventures something more than pure critique, unless it risks a political or ethical proposal. Without that, it has the impact of delegitimizing any human rights policy without suggesting any alternative. Any policy to promote human rights of democracy policy is shown to be deeply flawed or even pernicious. It is portrayed as part of the problem, certainly not as offering any kind of solution. Human rights policy appears to make the situation worse, not better. The critique has the effect of telling us clearly what we do not want, what we can not support—human rights policies by imperfect and hypocritical actors like the U.S. In its historical comparisons, it also lumps human rights policy together with colonialism and does not provide any elements to distinguish between one policy of surveillance and other. All are equally flawed. The ethical effect is to remove normative support from existing policies without producing any alternatives. This is similar to what Price means when he says that “critical accounts which do not in fact offer constructive normative theorizing to follow critique ironically lend themselves to being complicit with the conservative agenda opposing erstwhile progressive change in world politics.” Neither Doty nor Guilhot, for example, contrast two human rights policies to give examples of policies that are more of less hypocritical or where there has been more or 44 Guilhot, p. 14. 38 less surveillance. They don’t contrast human rights policies or democracy promotion policies to previous policies that were also hypocritical and self aggrandizing, but more pernicious – e.g. national security ideology and support for authoritarian regimes in the third world. By presenting no contrasts, the critique would appear to say that there is no ethical or political difference between a policy that supports coups and funds repressive military regimes and a policy that critiques coups and cuts military aid to repressive regimes. These policies would appear to be ethically indistinguishable. Indeed, by these standards, a realist policy (a la Kissinger) might be preferable. Kissinger didn’t denigrate his authoritarianism allies. He took regimes as they were. He treated them as valuable allies. He didn’t lecture them on how they should change. He also, in doing so, encouraged, in some cases, coups and mass murder. But at least he didn’t “Other”. Doty and Guilhot give me no ethical criteria to distinguish between the policies of the Kissinger administration, the Carter administration, and current Bush administration policy. Because the comparison is an implicit ideal, never an empirical real world example, the critique is very telling and can delegitimize the critiqued policy. But nothing is put in its place. So, it demobilizes any support we might have for any human rights policy. It puts the analyst in an ethically comfortable position, but by not proposing any explicit comparison, it demobilizes the reader. We learn what to oppose, to critique, but we don’t learn explicitly what to support in its stead. The result can be political paralysis. One finds it difficult to act.

#### \*Border adjustments solve international implementation and leakage

Helm et al 12 – Professor of economics at Oxford; Hepburn and Ruta are both professors of economics at LSE

(Dieter, Cameron, and Giovanni, “Trade, climate change, and the political game theory of border carbon adjustments”, Oxford Review of Economic Policy, Volume 28, Number 2, 2012, pp. 368–394)

There is reason to believe that although leakage rates from unilateral policies may not be great so far, using BCAs, and hence pricing consumption rather than production, could have a considerable impact in some sectors. Atkinson et al. (2011) estimate the potential size of a border tax on imports according to their embodied, or ‘virtual’, carbon. Tables 1–3 show the results. Table 1 presents estimates of the ‘effective tariff rate’ that each exporting country (row) would face on their goods and services if an importing country (column) placed a US$50 per ton of CO2 tax on the virtual carbon content of its imports. Atkinson et al. (2011) note that this illustrative carbon price represents the level of carbon price that a fairly ambitious mitigation target in high-income countries would entail. Prices over €30 per tonne were observed in the EUETS in 2008. We would stress, as in section II, that these ‘effective tariffs’ are actually the correction of an incorrect price, such that countries without such correction should be regarded as imposing undesirable ‘effective subsidies’ instead. Nevertheless, ‘effective tariffs’ provide a useful metric to indicate the scale of the impact of a BCA. Table 1 shows that exports from China to the EU would face an ‘effective tariff’ rate of 9.2 per cent of the value of exports. The rate on exports from China to the US would be of the same order of magnitude. We note in passing that China’s ‘exports’ of CO2 to the EU15 are 6.2 per cent of the total produced. The ‘exports’ of CO2 to both the EU15 and the US amount to 13.1 per cent of the total produced. This makes China exposed to the threat of a BCA imposed jointly by the EU and the US. Exports from the US to the EU would face a tariff of 2.9 per cent, while exports from the EU to the US face a 1.3 per cent effective tariff if the US were to impose a similar tax on embodied carbon. Of course such a measure would be unlikely, given that the EU is already imposing a carbon price on its domestic producers. BCAs would have greater impacts in some sectors than others. For example, an EU BCA on virtual carbon would have considerable impacts on Russia’s production and casting of non-ferrous metals such as aluminium, copper, and zinc, the production of chemicals, rubber and plastics, and iron and steel. In the group of economies in transition, sectors particularly affected include coal and oil mining, aluminium, copper and zinc, iron and steel, and cement. India and China would feel a particularly strong effect in their cement sectors (Table 2). If the US were to impose a similar border adjustment, it would severely impact Canadian production of natural gas and refined oil, and Mexican production of refined oil and metal ores. In China, cement is particularly exposed, as in India. Russia’s nonferrous metals and South Africa’s iron and steel and non-ferrous metals would also be affected (Table 3). The numbers above ignore the change in exports that would follow the imposition of a tariff. Mattoo et al. (2009) estimate the impact BCAs could have on trade flows and welfare. Their estimates are based on a computable general equilibrium (CGE) model developed by the World Bank with the purpose of assessing the growth and structural impacts of climate change and policies (multilateral and unilateral) on developing countries. They suggest that a border tax, when applied using emission intensities in the exporting country, would have serious consequences for large developing countries. For example, China’s manufacturing exports would decline by one-fifth and those of all low- and middle-income countries by 8 per cent; the corresponding declines in real income would be 3.7 and 2.4 per cent.13 Summing up, the numbers presented above suggest that if regions with domestic carbon pricing schemes, such as the EU, start applying BCAs this could have a significant impact on large fossil fuel-based exporters such as China and Russia, but relatively little impact on trading partners such as the USA. The underpinning economic logic of efficiency, the desirability of pricing consumption rather than production, coupled with the political fears over leakage (whether justified or not) suggest that pressure to resort to BCAs will increase over time. Indeed, given the glacial pace of the international negotiations, we would consider it probable that BCAs will actually be deployed. The next section puts this possibility in a strategic context. Our second argument is that BCAs have the potential to be a game changer in supporting, or potentially providing a substitute for, the international climate negotiations. These international negotiations have so far failed to deliver any more than ‘roadmaps for agreement’. There are now at least three ways to proceed for countries or regions aspiring to leadership, such as the EU: (i) maintain the current, largely unilateral policy regime, risking carbon leakage until a new global deal is implemented in 2020, and accepting major economic inefficiencies and increases in global emissions consistent with likely temperature increases above 2C; (ii) accept that the current regime leaves little chance of achieving the 2C temperature target, and extend exemptions from domestic carbon prices (e.g. the free allocations in the EUETS and Australian Carbon Price Mechanism) and other implicit subsidies to the export sector to protect domestic industry as the world warms; or (iii) apply BCAs to countries that have not taken ‘equivalent measures’ to internalize the carbon externality. Of the options, (i) involves the substantial uncertainty in United Nations Framework Convention on Climate Change (UNFCCC) negotiations over the coming years, notwithstanding the Durban roadmap to an agreement in 2015, which may or may not be as successful as the Bali roadmap to an agreement in 2009. Option (ii) undermines the very goals of domestic carbon policies (like the EUETS). While it is perhaps more hard-headed and realistic than option (i), it largely gives up on the chance of preventing serious climate change damages. Hence full BCAs are the only serious option to maximize the impact of climate policy by committed UNFCCC parties and maximize the chances of a sustained policy effort over time. We accept that countries may be hesitant about disturbing the fragile global trading system—indeed, it is likely that these concerns explain why BCAs have not already been more widely applied. However, we will argue that BCAs are a strategically and politically rational choice, in that they take into account what the other parties would do in response. While there is undoubtedly some risk to the trading regime, provided the (economically sound) rationale for BCAs is explained carefully and in good faith, it seems likely that the risks are low. Furthermore, arguably the risks to humanity from catastrophic climate change have both a higher probability of occurring and greater impact

should they occur, than the risks to the trading regime from BCAs. We proceed by first showing the theoretical potential for BCAs to be a game changer by examining the political game theory (section V(i)), second by showing that BCAs can be implemented in a legal context set by the WTO (section V(ii)), and third by briefly reviewing a number of practical implementation issues (section V(iii)). Assessing the impact of the unilateral imposition of a BCA requires considering the strategic interaction with trading partners that are at the same time (potential) parties to a multilateral climate change agreement and parties to a trade agreement. In this section, we develop a simple but insightful dynamic game-theoretic model. Our baseline is a business-as-usual scenario that remains fossil-fuel intensive, with significant risks of dangerous climate change. Other outcomes are evaluated against that baseline. Since the game illustrated here is dynamic, we start by describing a portion of it that we call the ‘trade sub-game’. The current world trade system is a combination of levers and ratchets that allow countries to stay in an equilibrium in which all participants experience high levels of welfare compared to a world with no free trade. ‘Ratchets’ include mechanisms that prevent countries from reverting to unilateral protectionism. The appellate body of the WTO is such a mechanism. If a country (say country B) puts a trade restriction on imports from another country (say country A), the affected party can present a dispute to the appellate body. If the appellate body rules against the trade restriction, country A is given the right to retaliate through further trade restrictions. The threat of retaliation is made credible by the fact that country A can reduce its losses from the trade restriction imposed by country B by imposing a further trade restriction. While country A would be better off in the free trade status quo, it would have an incentive to impose trade restrictions once country B imposes one. The payoffs in the game in Figure 1 capture a key political essence of the trade system: a trade restriction would have winners and losers but would impose a cumulative welfare loss. In essence, a large country imposing a trade restriction is able to have a net political gain equal to p while imposing a welfare loss of –q to the affected party. The assumption that q > p implies that there is a net loss in cumulative welfare when a country imposes a trade restriction. We recognize that these payoffs do not map on to basic conventional trade theory (which holds that unilateral reductions in tariffs would benefit the country reducing them).14 However, this set of payoffs more accurately depicts the political incentives faced by national decision-makers, who are lobbied intensively by the losers of trade liberalization, and obtain minimal support from the diffuse set of winners. The description of the trade game illustrates how the world is able to sustain equilibrium with free trade. In the absence of a coordination mechanism, countries would de facto move simultaneously as in a ‘prisoner’s dilemma’ type of game. It is easy to see that in such a case the Nash equilibrium would then be achieved by mutually imposing trade restrictions. Trade agreements transform the simultaneous game into a dynamic game through the working of the institutional mechanisms they set up. With the WTO mechanism in place, if one of the two countries moves first and does so against trade rules, the second one can wait to obtain the ‘right’ to move and retaliate. This credible threat is enough to prevent the first country imposing a trade restriction. We can now outline the BCA game, shown in Figure 2. This complements the trade sub-game with a dynamic game of complete information in which country A (say a ‘leader’ like the EU) moves first by either (i) imposing a BCA, or (ii) not taking any trade action and hoping that negotiations towards a global climate change agreement turn out to deliver. The larger BCA game is a dynamic game encompassing the trade sub-game considered above. Payoffs of the BCA game are presented below the payoffs of the trade sub-game. The assumed payoffs are based on the costs and benefits of imposing a BCA. Consider first, for the sake of illustration, a large economy that produces all it consumes. If the country imposes a carbon price adjustment, it will gain by reducing the distortion caused by ‘over-consumption’ of carbon emissions. The cost imposed on consumers (reduction in consumer surplus) and producers (reduction in producer surplus) will be partly offset by the government revenues. In addition, the environmental damage generated by CO2 emissions will be reduced relative to the case with no carbon adjustment, and various other ancillary benefits (local environmental and health benefits) accrued. In a large country, it is not unreasonable to assume that even if the BCA is set at the globally optimal carbon price (rather than just the optional carbon price given damage to the large country), these environmental benefits may offset the remaining loss in consumer and producer surplus. Suppose now that the economy is importing part of what it consumes, and that carbon pricing includes an adjustment at the border. If the economy is large enough, the BCA will cause world prices for the goods subject to the BCA to fall (a ‘terms-oftrade’ gain). In other words, the loss in consumer and producer surplus is being partly offset by terms-of-trade gains (the carbon adjustment will raise domestic resources at the expense of consumers and producers abroad). Compared to the closed economy case, a carbon adjustment including a BCA will be even more advantageous to the country imposing it.15 Figure 2 illustrates the situation when a large economy (country A) imposes a BCA and receives an environmental benefit, e, plus a net economic benefit (terms-of-trade gain minus consumer and producer surplus) equal to x. These payoffs apply if country B does not respond, which would be highly unlikely, as we now see. Next we analyse the welfare effect of the BCA on the exporting country (country B). Assume that the exporting country does not have a preference for a cleaner environment. If the country imposing the BCA (country A) is large, the BCA will lower world prices for the goods it imports. This will in turn reduce producer surplus in the exporting country (country B). The loss will be partly offset by an increase in consumer surplus in country B. However, in general, there will be a net welfare loss in country B (remember that we are assuming that country B does not care about climate change). In Figure 2 we assume that by imposing a BCA, large country A imposes on large country B a net loss (consumer surplus minus producer surplus) equal to –y. The play of the game is as follows. The game starts with country A choosing whether to impose a carbon price accompanied by a BCA, or to fail to price carbon altogether. Assume that an international court (say the WTO’s appellate body) has ruled that the BCA is not counter to trade rules. Country B can now (i) do nothing, (ii) retaliate with a trade restriction, or (iii) apply a carbon adjustment to its exports (so as to avoid country A’s BCA). Retaliation with a trade restriction leads to the second stage in the trade game, that is, country A will have a ‘right’ to retaliate with further restrictions on trade or do nothing. We determine the sub-game perfect Nash equilibrium (SPNE) of the BCA game by backwards induction. Under the assumption that the BCA does not interfere with the payoffs of the trade game, the sub-game following the imposition of a BCA will result in country B preferring to do nothing rather than retaliate. But what if country B can apply a carbon adjustment to its exports, thus forcing country A to reduce its BCA commensurately? Doing so would reduce the cost to country B, in that it will either generate government revenues (e.g. in the case of a carbon export tax) or producer rents (e.g. in the case of quantity restrictions on the amount of emissions exported), which will partly offset the loss in producer welfare caused by the original BCA. We denote these benefits by z, and note that it is highly likely that z > 0. From country B’s perspective, a carbon adjustment to exports will be preferred to doing nothing, which will in turn be preferred to retaliating (given country A’s credible threat). By applying a carbon adjustment to exports, the government in country A will no longer enjoy the revenues it raised through the BCA. Even so, it is likely that this is preferable to not pricing carbon at all. Indeed, provided the environmental benefits plus producer surplus gains exceed the losses (i.e. x + e – z > 0), the SPNE of the game is for country A to apply the BCA and for country B to respond with an carbon export adjustment. An equivalent outcome, with perhaps less hostility, would be for country A to apply the BCA, and then deliver the revenue raised directly to country B, thus moving the game directly to the SPNE outcome. As a real-world example of these dynamics, consider the current dispute between the EU and the rest of the world (ROW) about the inclusion of aviation in the EUETS as a case in point (see sections V(ii) and V(iii) below). The inclusion of aviation is analogous to imposing a carbon price with a BCA, because the carbon price applies to any flight landing or departing in the EU. ROW will find it optimal to respond to this EU ‘BCA’ with its own carbon export adjustment.16 This is economically rational, in that it allows the ROW to extract the surplus from carbon pricing before the EU does. If the ROW’s optimal response to a BCA is to respond with a carbon export adjustment, it will be in the EU’s interests to introduce a BCA in the first place, rather than ‘do nothing’, and the upper-right branch of the game represents the SPNE. This is what appears to be occurring. To summarize, BCAs build on the trade game currently being played by trading partners. If we accept that the world is currently at the SPNE of the ‘trade game’, then the introduction of a BCA coupled with an export adjustment in response will be a SPNE provided x + e – z > 0 and the BCA does not change the relative size of the payoffs in the trade game (i.e. p > 0 always and q > p always). These are relatively innocuous assumptions. We note that BCAs must be carefully designed. BCAs imposed on protectionist grounds (e.g. to protect jobs) would constitute ‘murky protectionism’ discussed by Evenett and Whalley (2009) and would actually backfire for country A if z > x + e. The environment motive is important to the argument, given that it is far from impossible that x (the financial flows to the country imposing the BCA) and z (the financial flows from carbon adjustment on exports in response) are similar in magnitude. For the BCA to be the SPNE, e must be large enough such that x + e > z. We also note that we have not explicitly analysed the full set of actions available to country A. For instance, rather than combining a domestic carbon price with a BCA (which is equivalent to pricing on a consumption basis), country A might combine a domestic carbon price with an export subsidy17 to level the playing field for industries exporting to countries without carbon pricing. This would not generate the same environmental benefit, e, for country A, because the carbon price would not radiate out through the global economy.18 Furthermore, it would not generate the same net economic benefits, x, but would instead involve net costs. Such a strategy is thus not optimal in our model. However, if the use of BCAs would actually cause the entire global trade regime to collapse, and result in countries engaging in self-harming retaliatory protectionism, then the underlying trade game is not as we have described it and the optimal strategy on BCAs is different. Provided it is made clear that the BCA (i) is based on sound economics; (ii) provides a level playing field for domestic and foreign firms; and (iii) is WTO-compliant, our view is that pricing carbon domestically and at the border should not bring the trade regime to the point of collapse. It is economically rational to price externalities, and, indeed, factor prices need to be correct to guarantee that trade is welfare-enhancing. The price on carbon is particularly important for developing countries—if emissions are not priced properly, the consequences for human welfare, especially in poor countries, appear likely to be extremely serious. Our simple analysis also abstracts from a range of very important factors of international political affairs. For instance, the private-sector response to government actions is also important, as we discuss below in section V(iii). However, we believe that this simple model captures the essence of the strategic interaction. In short, a party like the EU has a strong incentive to introduce BCAs to complement its near-unilateral carbon prices. Once the EU does so, the rest of the world has a strong incentive to respond with carbon export adjustments, or potentially even a national carbon price, rather than starting a trade war. And, as we now argue, this is precisely what is currently under way, with aviation as the first theatre of strategic interaction. In addition to compliance with general international law, because BCAs change competitiveness and trade patterns, they are also subject to WTO rules. Debate about whether BCAs are WTO compliant may become heated in the coming 18–24 months, prior to the 2015 deadline for the agreement of a post-2020 set of carbon emissions caps following Durban. Anticipating the battle on the horizon, in September 2011, India pre-emptively asked the UN to table a proposal to ban climate-related protectionist measures, including border taxes, at the negotiations in South Africa. Rich countries commented that the issue should be addressed at the WTO rather than at UNFCCC talks.19 One difficulty is that WTO rules do not (and will not) provide clarity as to whether border adjustments, in the abstract, are compliant. A ruling by a WTO Dispute Panel can only be made on a specific border adjustment, and only once it has been implemented and challenged. Compliance will depend strongly on the specific design. The important point, however, is that it is theoretically possible to design a WTO-compatible border adjustment. The first hurdle is that border adjustments prima facie could be considered to breach ‘non‐discrimination’ requirements on the grounds that imported goods are ‘like’ domestically produced goods, notwithstanding their greater embodied emissions.20 So compliance with WTO rules rests on the General Agreement on Tariffs and Trade (GATT)’s ‘general exceptions’. The most relevant likely exemption is article XX(g) that relates to the conservation of natural resources. Previous legal decisions suggest that an article XX(g) exemption would require the border adjustment to account for the comparability of climate change policies in the trading partner countries, and allow individual foreign producers to show that they have exceeded their national domestic requirements, and are thus entitled to appropriate individual treatment. These features are entirely feasible elements of a well-designed BCA. Other features of a border adjustment that increase the likelihood of compliance include ensuring that: − importers pay in the same manner as domestic producers (e.g. purchase and retire permits under the EUETS); − the terms faced by importers are ‘no less favourable’ than those given to domestic producers; − the assessment of other countries’ climate policies is based on a formal judgement that can be appealed and which has involved some degree of input from the affected countries; and − (partial) exemption from the adjustment is given to countries who make efforts that are ‘comparable in effectiveness’, even if they do not enact policies of exactly the same form. Again, all of these features can be incorporated into a BCA.

While the issues are complicated, a WTO-compliant BCA can be designed. Further, the political game theory set out above suggests it is likely to be designed and implemented. The aviation example illustrates some of these issues. On January 2012, the EU incorporated international aviation into the EUETS. Airlines now have to surrender European allowances (EUAs) to cover their annual emissions. While 85 per cent of the permits are allocated to airlines free of charge, polluting airlines will have to buy additional EUAs to cover their liability. The policy has the effect of imposing a carbon price on all flights to and from Europe irrespective of the destination or domicile of the carrier, and thus operates in a similar fashion to a BCA. Given that a substantial proportion of global aviation starts or stops in the EU, this is an extremely significant policy. The policy has, not surprisingly, been vigorously challenged by a large number of other countries, including India, the US, and China. An important indication of potential retaliation was China’s threat in June 2011 to prevent Hong Kong Airlines from purchasing 10 A380 aircraft from Airbus, a subsidiary of an EU aerospace and defence group. More recently, the China Air Transport Association (CATA), which represents four of the country’s biggest airlines, has announced they will not pay for the emissions allowances. Political pressure was applied on the EU in September 2011, with a declaration by a coalition of over 20 countries, led by India, that the inclusion of aviation violated international law, following a meeting hosted by India of the non-EU members of the UN International Civil Aviation Organization (ICAO). This initial pressure was backed by legal action, with a case launched in the European Court of Justice, the EU’s highest court, by US airlines, arguing that the policy broke international law. However, on December 2011, the European Court of Justice held that the inclusion of aviation in the EUETS did not infringe the sovereignty of other states and is compatible with international law. Further, in March 2012, a coalition of US airlines dropped a case brought in the High Court in London.21 The fight is thus now relegated to the diplomatic and political level. In February 2012, the Chinese government banned airlines from complying with the scheme. However, in April 2012, China indicated that it might use revenue from a passenger tax on international flights to cut emissions from the aviation sector,22 an indication of an interest in getting exemption on the grounds of taking ‘equivalent measures’. One might expect other countries similarly to look for the equivalent of a ‘carbon export adjustment’ which will allow them to capture the revenue in country, and claim an exemption from inclusion in the EUETS. Action by the EU seems unlikely to stop with aviation: the EU has already stated its intention to extend the ETS to the international shipping unless the maritime industry reaches agreement to reduce its emissions. Furthermore, support in the form of free EUAs will be withdrawn in 2013, so the EU shipping industry will likely seek to protect its competitiveness by ‘levelling the playing field’ at the borders. Given these early disputes, how in practical terms, is the game likely to progress? One would expect a first mover (whether the EU or another region) to start with a BCA on a very specific product (e.g. aviation or cement) and gradually extend to other carbon intensive sectors. A plausible sequence might be as follows. 1. Start, as has already occurred, by incorporating aviation into carbon pricing, with no exemptions based on the domicile of the carrier. By providing all private carriers with (valuable) free permits that can be sold immediately on to the market, private airlines domiciled in other jurisdictions have an incentive to engage with and comply with the scheme, making it more difficult for their national governments to object. 2. Move to impose a BCA on another carbon-intensive industry. Cement is one example. Here, domestic industry might support the protection provided by a BCA, to the extent that allowances must be purchased in future trading phases. Further, cement has the benefit that the calculation of emissions and related technical issues are relatively simple. BCAs look attractive compared to free permits, which have created major welfare losses. For inland cement, where competition is low, they have merely delivered windfall profits to producers; while for coastal cement markets the competition has been too intense for free permits to make much difference (Demailly and Quirion, 2006). 3. The likely response is that other countries will follow suit with their own carbon export adjustments or broader carbon prices, and the impetus for a ‘sectoral agreement’ will increase. This might be agreed through a body such as the World Business Council for Sustainable Development (WBCSD). The likely result is a patchwork of carbon prices that, broadly speaking, apply to cement globally. 4. With the success of the cement BCA, the first mover transitions the focus to the next most attractive industry (e.g. steel).23 5. The result of this sequence is that incentives are strengthened for other countries to price carbon. With carbon pricing scheduled for implementation by 2015 in China and Australia, among others, countries without carbon prices will increasingly see other nations collect the rents that accrue from correcting pollution prices. The incentive to capture these rents domestically, rather than see the Europeans, Chinese, and Australians take the profits, is likely to prove too attractive to countries with no carbon price. In this fashion, BCAs increase the pressure for the gradual dissemination of carbon prices around the world. And none of this needs international agreement or the United Nations process, although it could aid and accelerate those processes. Furthermore, as noted above, the economic theory for BCAs is sound; the conceptual notion of pricing carbon consumption rather than production makes sense, and politically the threat of implementation is entirely credible given the dynamic game that ensues. There is a range of practical objections. An important one is that the calculation of appropriate BCAs will be devilishly difficult. However, the analogy with the environmental valuation literature is a relevant one. Valuing a species is several orders of magnitude more difficult than determining the carbon price differential between two countries. Species valuations are inherently approximate (Helm and Hepburn, 2012). But they are better than an implicit valuation of zero, which is the result if one allows the perfect to be the enemy of the good. Starting with a small number of very heavily carbon-intensive industries (cement, steel, chemicals, and electricity imports) will make a lot of difference to emissions and to the political game theory of climate policy. Critically, it improves on what is precisely the wrong answer—no BCA at all. For these industries, there are a number of ways of approximating the embodied carbon. Take the example of steel, exported from China. The energy inputs can be approximated, and we know the share of coal in Chinese electricity generation (around 80 per cent) and we know the emissions from coal power stations. We can then make an estimate of the carbon content of the steel. It would be open for the Chinese exporter to demonstrate that it had, for example, used renewable energy (and it would now have an incentive to do so), and it would also be open to China to impose a carbon price on domestic carbon production, justifying an exemption from the BCA. In the worst case, BCAs could be applied using domestic (as opposed to foreign) emission intensities. This would ensure that foreign producers are not given ‘unfair’ treatment vis-à-vis domestic producers. Would this put the environmental effectiveness of the measure in peril? Mattoo et al. (2009) estimate that border tax adjustment based on the carbon content in domestic production, rather than on the carbon contents of imports, would broadly address the competitiveness concerns of producers in high-income countries without seriously damaging developing-country trade. In summary, practical objections are capable of being addressed in a pragmatic way that maximizes the incentives for inducing the carbon exporter to join a carbon pricing group of countries, in line with what the political game theory analysis above suggests. There is no escaping the fact that the world has made little progress in mitigating climate change. The recent Durban conference postponed effective action for another decade—a period in which the Chinese and Indian economies will double in size at current growth rates. While the search for a comprehensive, legal, binding global agreement remains important, the climate cannot wait. The slow progress is likely to result in at least a 2C warming, and there is good scientific evidence to suggest that bigger increases this century are now the most likely outcome, with potentially catastrophic consequences. In these circumstances, some countries and regions will—and do—wish to take unilateral action. The EU remains the most willing, but it is now confronted with the economic crisis and concerns about carbon leakage. Carbon leakage in turn highlights a fundamental problem with Kyoto. Kyoto is based upon carbon production, not carbon consumption. The Kyoto-capped countries can reduce their measured production of emissions by reducing production in the carbon-intensive sectors, and then import back the carbon-intensive goods. The potential carbon leakage problem arises because we currently have a multispeed carbon world, some with carbon prices, most without. This creates a trade distortion and undermines the incentives to introduce and increase unilateral carbon prices. The answer is to impose BCAs so that carbon produced domestically is treated on the same basis as carbon embedded in imports, so the carbon content is independent of the geography of its production. Introducing BCAs corrects the trade distortion caused by those countries that do not price carbon. These countries are subsidizing dirty production, and gaining a trade advantage. BCAs provide a mechanism to put this right, enhancing efficiency, and in the process creating incentives for the countries without carbon prices to introduce them. BCAs provide a pragmatic way of gradually expanding the ‘coalition of the willing’, without having to wait for a top-down global treaty. Thus BCAs both remove distortions and encourage convergence towards a global carbon price. They can be compatible with the WTO rules, and they can be introduced gradually in a pragmatic way, focusing initially on energy-intensive industries. But it is not just that they can be introduced: they need to be introduced if existing unilateral actions are not to peter out. The politics of carbon leakage—as well as the economics—are potentially lethal for carbon pricing, unless the trade distortions are addressed. BCAs are not just an efficiency-enhancing addition to the climate change problem: they provide perhaps the only way of making substantial and speedy progress.

# 2AC

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#### Climate change represents another removal – the disproportionate effects on reservation land and the denial of federal disaster assistance condemns natives to disparate climate impacts

Flavelle 2021

Christopher Flavelle and Kalen Goodluck, New York Times, “Dispossessed, Again: Climate Change Hits Native Americans Especially Hard” July 1, 2021 <https://www.nytimes.com/2021/06/27/climate/climate-Native-Americans.html>

In Chefornak, a Yu’pik village near the western coast of Alaska, the water is getting closer.

The thick ground, once frozen solid, is thawing. The village preschool, its blue paint peeling, sits precariously on wooden stilts in spongy marsh between a river and a creek. Storms are growing stronger. At high tide these days, water rises under the building, sometimes keeping out the children, ages 3 to 5. The shifting ground has warped the floor, making it hard to close the doors. Mold grows.

“I love our building,” said Eliza Tunuchuk, one of the teachers. “At the same time, I want to move.”

The village, where the median income is about $11,000 a year, sought help from the federal government to build a new school on dry land — one of dozens of buildings in Chefornak that must be relocated. But agency after agency offered variations on the same response: no.

From Alaska to Florida, Native Americans are facing severe climate challenges, the newest threat in a history marked by centuries of distress and dislocation. While other communities struggle on a warming planet, Native tribes are experiencing an environmental peril exacerbated by policies — first imposed by white settlers and later the United States government — that forced them onto the country’s least desirable lands.

And now, climate change is quickly making that marginal land uninhabitable. The first Americans face the loss of home once again.

In the Pacific Northwest, coastal erosion and storms are eating away at tribal land, forcing native communities to try to move inland. In the Southwest, severe drought means the Navajo Nation is running out of drinking water. At the edge of the Ozarks, heirloom crops are becoming harder to grow, threatening to disconnect the Cherokee from their heritage.

Compounding the damage from its past decisions, the federal government has continued to neglect Native American communities, where substandard housing and infrastructure make it harder to cope with climate shocks.

The federal government is also less likely to help Native communities recover from extreme weather or help protect them against future calamities, a New York Times review of government data shows.

Interviews with officials, members and advisers at 15 federally recognized tribes portray a gathering climate crisis and a test of the country’s renewed focus on racial equity and environmental justice.

Many tribes have been working to meet the challenges posed by the changing climate. And they have expressed hope that their concerns would be addressed by President Biden, who has committed to repairing the relationship with tribal nations and appointed Deb Haaland, the first Indigenous cabinet secretary, to run the Interior Department. But Mr. Biden has announced few specific policies or actions to directly reduce the climate risk already facing Native communities, and Ms. Haaland’s office declined repeated requests for an interview.

“The stakes are very, very high,” said Fawn Sharp, president of the National Congress of American Indians. “We’re running out of time.”

Forced Off Their Land, Again

The Quileute Nation is a collection of about 135 homes on a narrow slice of land at the edge of the Olympic Peninsula that juts into the Pacific, about 100 miles west of Seattle.

As temperatures rise, the atmosphere holds more water, producing more frequent and intense storms. High winds now regularly knock out the electricity, while homes along the main street are vulnerable to flooding. The single road that connects the community to the outside world is often rendered impassable by water.

“The village is 10 to 15 feet above sea level,” said Susan Devine, a project manager who is working with the Quileute. During major storms “those waves are bigger than you,” she said.

Hundreds of years ago, the reservation was a fishing village, among many locations used by the Quileute as they moved according to the demands of the weather.

That changed in 1855 when a treaty stripped the tribe of most of its land; President Grover Cleveland later issued an executive order confining the Quileute to a single square mile — all of it exposed to flooding.

“No one chose to be in a seasonal fishing area year-round,” Ms. Devine said.

The resulting vulnerability has pushed the tribe to pursue a solution that few non-Native towns in the United States have seriously considered: Retreating to higher ground.

“Climate change has forced us to make the heart-wrenching decision to leave the village,” Doug Woodruff, chairman of the Quileute Tribal Council, said in a December statement. “Without a cohesive national and international strategy to address climate change, there is little we can do to combat these impacts.”

Through a spokeswoman, Mr. Woodruff and other members of the council declined repeated requests to be interviewed.

In 2012, Congress gave the tribe permission to relocate inside the adjacent Olympic National Park. But without a tax base to pay for its move, the tribe sought federal money. Progress has been slow: The Quileute received about $50 million in grants to build a new school farther from the coast, but the total cost to relocate homes and other facilities could be two or three times that much, according to Larry Burtness, who manages federal grant applications for the Quileute.

Forty miles south, the Quinault tribe has been working on its own plan to retreat from Taholah, the reservation’s main town, for almost a decade. Tucked between a driftwood-strewn beach and a coastal rainforest, Taholah is exposed to storms, flooding and frequent power outages. That tribe has also struggled to get federal help.

“There’s no single source of revenue, at a state level or congressionally, to undertake these kinds of projects,” said Ms. Sharp, who was president of Quinault Nation until March.

A Struggle for Federal Aid

The federal government offers help to communities coping with the effects of climate change. But Native Americans have often been less able to access that help than other Americans.

“We’re the most disproportionately impacted by climate, but we’re the very least funded,” said Ann Marie Chischilly, executive director of the Institute for Tribal Environmental Professionals at Northern Arizona University.

The Federal Emergency Management Agency is less likely to grant requests for aid from native tribes recovering from disaster, compared to non-Native communities, according to FEMA data.

Native Americans are also less likely to have flood insurance, making it harder to rebuild. Of 574 federally recognized tribes, fewer than 50 participate in the National Flood Insurance Program, according to a review of FEMA data.

That’s partly because the federal government has completed flood maps for just one-third of federally recognized tribes, compared with the vast majority of counties. Flood maps can help tribal leaders more precisely understand their flood risks and prompt residents to purchase flood insurance.

But insurance premiums can be prohibitively expensive for Native Americans.

Individual households on Native lands are also less likely to get federal help girding for disasters. Of the 59,303 properties that have received FEMA grants since 1998 to prepare for disasters, just 48 were on tribal lands, according to Carlos Martín, a researcher at the Urban Institute.

FEMA said it is committed to improving tribal access to its programs.

Chefornak’s efforts to relocate its preschool illustrate the current difficulties of dealing with the federal government.

While FEMA offers grants to cope with climate hazards, replacing the school wasn’t an eligible expense, according to Max Neale, a senior program manager at the Alaska Native Tribal Health Consortium, who helped Chefornak search for federal aid.

The Department of Housing and Urban Development has a program to pay for infrastructure on tribal lands, but the maximum amount available wasn’t enough for a new school, and the agency wouldn’t grant money until the village had found other ways to make up the difference, Mr. Neale said.

HUD declined to comment on the record.

Replacing the preschool would only begin to address Chefornak’s troubles. Some two dozen homes need to be relocated, potentially costing more than $10 million, according to Sean Baginski, an engineer working with the village. And Chefornak is just one of more than 100 Native villages in Alaska alone that are exposed to significant climate risks.

“If the intent is for the government to find a way to fund this stuff,” Mr. Baginski said, “now would be a good time.”

Living Without Water

Damian Cabman, a member of the Navajo tribe, filled buckets of water to take home at the Bataan water loading station in Gallup, N.M. Many tribe members had relied on wells that have run dry with climate change.

Damian Cabman, a member of the Navajo tribe, filled buckets of water to take home at the Bataan water loading station in Gallup, N.M. Many tribe members had relied on wells that have run dry with climate change. Credit...Kalen Goodluck for The New York Times

Twice a week, Vivienne Beyal climbs into her GMC Sierra in Window Rock, a northern Arizona town that is the capital of Navajo Nation, and drives 45 minutes across the border into New Mexico. When she reaches the outskirts of Gallup, she joins something most Americans have never seen: a line for water.

Ms. Beyal’s destination is a squat concrete building that looks like a utility shed, save for the hoses that extend from either side. Once there, she waits as much as half an hour for her turn at the pump, then fills the four 55-gallon plastic barrels in the back of her truck.

The facility, which is run by the city of Gallup, works like an air pump at a gas station: Each quarter fed into the coin slot buys 17 gallons of water. Most of the people in line with Ms. Beyal are also Navajo residents, crossing into New Mexico for drinking water. “You can show up whenever you want,” she said. “As long as you can pay for it.”

Ms. Beyal has lived in Window Rock for more than 30 years and once relied on the community well near her home. But after years of drought, the water steadily turned brown. Then last year, it ran dry. “It’s on us to get water now,” she said.

Like much of the American West, Navajo Nation, the largest tribe in the country, has been in a prolonged drought since the 1990s, according to Margaret Hiza Redsteer, a professor at the University of Washington.

“As snowfall and rain levels have dropped, so have the sources of drinking water,” Dr. Redsteer said. “Surface streams have disappeared, and underground aquifers that feed wells are drying up. Conditions are just continuing to deteriorate.”

The federal government says the groundwater in the eastern section of Navajo Nation that feeds its communal wells is “rapidly depleting.”

“This is really textbook structural racism,” said George McGraw, chief executive officer of DigDeep, a nonprofit group that delivers drinking water to homes that need it. Navajo Nation has the greatest concentration of those households in the lower 48 states, he said.

The federal government is working on a billion-dollar project to direct more water from the San Juan River to a portion of the reservation, but that work won’t be finished until 2028.

The drought is also changing the landscape. Reptiles and other animals are disappearing with the water, migrating to higher ground. And as vegetation dies, cattle and sheep have less to eat. Sand dunes once anchored by the plants become unmoored — cutting off roads, smothering junipers and even threatening to bury houses.

“We’ve got to adapt to these conditions,” said Roland Tso, an official in the Many Farms area of Navajo Nation, where high temperatures hovered near 100 degrees for much of June. “We’re seeing the weather going crazy.”

New Administration, New Promises

As a presidential candidate last year, Mr. Biden highlighted the connection between global warming and Native Americans, saying that climate change poses a particular threat to Indigenous people.

But Mr. Biden’s most ambitious climate proposal, written into his $2 trillion infrastructure plan, included just two references to tribal lands: unspecified money for water projects and relocation of the most vulnerable tribes.

A White House spokesman, Vedant Patel, declined to comment on the record.

Ms. Haaland’s role as interior secretary gives her vast authority over tribal nations. But the department declined to talk about plans to protect tribal nations from climate change.

Instead, her agency provided a list of programs that already exist, including grants that started during the Obama administration.

“At interior, we are already hard at work to address the climate crisis, restore balance on public lands, and waters, advance environmental justice, and invest in a clean energy future,” Ms. Haaland said in a statement.

Heritage at Risk

Beyond the threats to drinking water and other basic necessities, a warming planet is forcing changes in the ancient traditions.

In Northern California, wildfires threaten burial sites and other sacred places. In Alaska, rising temperatures make it harder to engage in traditions like subsistence hunting and fishing. And on Cherokee Nation land, at the northeastern corner of Oklahoma, changing precipitation and temperature patterns threaten the crops and medicinal plants that connect the tribe with its past.

In 1830, President Andrew Jackson signed the Indian Removal Act, which resulted in the forced relocation of five tribes, including the notorious march of the Cherokee, from the Southeastern United States to Oklahoma, known as the Trail of Tears.

Despite losing their land, the Cherokee retained part of their culture: Heirloom beans, corn, and squash, as well as a range of medicinal plants such as ginseng, which they continued to grow in the temperate highlands at the eastern tip of their reservation.

“There was certainly a lot lost, but there was also a lot that was able to be maintained,” said Clint Carroll, a professor at the University of Colorado and a citizen of Cherokee Nation.

Now, drought and heat make it harder to grow the plants and crops of their ancestors.

“It can be seen as another removal,” Dr. Carroll said. But this time, he said, “Cherokee people aren’t moving anywhere — it’s the environment that’s shifting.”

In March, Pat Gwin, senior director for Cherokee Nation’s environmental resources group, showed a visiting journalist the tribe’s heirloom garden in Tahlequah, an enclosed plot the size of a tennis court where traditional squash, tobacco, corn, beans and gourds grow.

Seeds from the plants are distributed to Cherokee citizens once a year, a link to centuries of culture and existence that is dimming.

“Our access to and use of the land is so tied up with identity,” said Anton Treuer, professor of Ojibwe at Bemidji State University in Minnesota. “It’s who we are as a people.”

#### Thorium solves.

Sameer Surampalli 19, BS in Electronics and Electrical Engineering from the University of Missouri-Columbia, Senior Interconnection Project Engineer at AES Clean Energy, 8/13/2019, “Is Thorium the Fuel of the Future to Revitalize Nuclear?” https://www.power-eng.com/nuclear/reactors/is-thorium-the-fuel-of-the-future-to-revitalize-nuclear/#gref

Nuclear energy produces carbon-free electricity, and the United States has used nuclear energy for decades to generate baseline power.

Nuclear energy, however, carries a dreaded stigma. After disasters such as Chernobyl, Three Mile Island, and Fukishima, the public is acutely aware of the potential, though misguided, dangers of nuclear energy. The cost of nuclear generation is on the rise—a stark contrast to the decreasing costs of alternative energy forms such as solar and wind, which have gained an immense amount of popularity recently.

[POWERGEN 2022 Call for Speakers: Tracks and Hubs Explained](https://www.power-eng.com/powergen/shaping-the-future-of-generation-together-powergen-tracks-and-hubs-explained/)

This trend could continue until market forces make nuclear technology obsolete. Into this dynamic comes a resurgence in nuclear technology: liquid fluoride thorium reactors, or LFTRs (“lifters”). A LFTR is a type of molten salt reactor, significantly safer than a typical nuclear reactor. LFTRs use a combination of thorium (a common element widely found in the earth) and fluoride salts to power a reactor.

A typical arrangement for a modern thorium-based reactor resembles a conventional reactor, albeit with notable differences. First, thorium-232 and uranium-233 are added to fluoride salts in the reactor core. As fission occurs, heat and neutrons are released from the core and absorbed by the surrounding salt. This creates a uranium-233 isotope, as the thorium-232 takes on an additional neutron. The salt melts into a molten state, which runs a heat exchanger, heating an inert gas such as helium, which drives a turbine to generate electricity. The radiated salt flows into a post-processing plant, which separates the uranium from the salt. The uranium is then sent back to the core to start the fission process again.

Thorium reactors generate significantly less radioactive waste, and can re-use separated uranium, making the reactor self-sufficient once started. LFTRs are designed to operate as a low-pressure system unlike traditional high-pressure nuclear systems, which creates a safer working environments for workers who operate and maintain these systems. Additionally, the fluoride salts have very high boiling points, meaning even a large spike in heat will not cause a massive increase in pressure.

Both of these factors greatly limit the chance of a containment explosion. LFTRs don’t require massive cooling, meaning they can be placed anywhere and can be air-cooled. If the core were to go critical, gravity would allow the heated, radiated salt to spill into passive via underground fail-safe containment chambers, capped by an ice plug that melts upon contact.

LFTRs provide numerous benefits. Any leftover radioactive waste cannot be used to create weaponry. The fuel cost is significantly lower than a solid-fuel reactor. The salts cost roughly $150/kg, and thorium costs about $30/kg.

If thorium becomes popular, this cost will only decrease as thorium is widely available anywhere in the earth’s crust. Thorium is found in a concentration over 500 times greater than fissile uranium-235. Historically, thorium was tossed aside as a byproduct of rare-earth metal mining. With extraction, enough thorium could be obtained to power LFTRs for thousands of years. For a 1 GW facility, material cost for fuel would be around $5 million. Since LFTRs use thorium in its natural state, no expensive fuel enrichment processes or fabrication for solid fuel rods are required, meaning the fuel costs are significantly lower than a comparable solid-fuel reactor. In an ideally working reactor, the post chemical reprocessing would allow a LFTR to efficiently consume nearly all of its fuel, leaving little waste or byproduct unlike a conventional reactor. Lastly, a thorium plant will operate at about 45 percent thermal efficiency, with upcoming turbine cycles possibly improving the overall efficiency to 50 percent or greater, meaning a thorium plant can be up to 20 percent more efficient than a traditional light-water reactor.

LFTRs do present a few challenges. There are significant gaps in the research and necessary materials for LFTRs. The post-processing chemical facilities, which would separate uranium from the molten salts for re-use, haven’t been viably constructed yet. Each reactor would require some highly enriched uranium (such as uranium-235) to start the reactor, which is very expensive. Scientists suggest a $5 billion investment over the next five years could net a viable reactor solution in the United States, but with limited funding for thorium, it is difficult to see this vision come to fruition. Other countries have made preliminary investments towards building thorium reactors.

The public stigma about nuclear is real, and that must be overcome first before lawmakers will take action, as money needs to be allocated for research and development to continue on LFTRs in the United States. Without public and scientific support, it will be difficult to move forward with this technology. Education is needed to help push the agenda for thorium, spread information about thorium-based reactors, and educate the public about their safety. Resources to learn more about thorium and LFTRs include websites such as The Independent Global Nuclear News Agency and World Nuclear News, or conferences such as the Thorium Energy Conference.

Thorium reactors are a different way to generate electricity that could benefit the world. More efficient than their fossil fuel counterparts, safer than a conventional nuclear plant, and generating no carbon emissions as a byproduct, LFTRs are a viable solution for the future of our world’s energy needs.

#### Liquid salt is viable, solves long-term waste, and can’t make nuclear weapons—also rollout is super fast

Larson 11/11 (Aaron Larson, executive editor for POWER, cites Thomas Jam Pedersen, MSc in Mathematical Modelling co-founder of Copenhagen Atomics, 11-11-2021, "Thorium-Fueled Reactors Offer Huge Potential Benefits for the Nuclear Power Industry," POWER Magazine, https://www.powermag.com/thorium-fueled-reactors-offer-huge-potential-benefits-for-the-nuclear-power-industry/)

Nuclear power opponents often point to radioactive waste as one of their main concerns. However, most people don’t realize that problems associated with long-lived waste can actually be solved in an economic way with technology that’s already well-proven. Long-lived actinides can be “burned” in a thorium molten salt reactor (MSR), or a breeder reactor. They do not burn fast, but in this way, it is possible to convert the most problematic part of the waste from something that needs to be stored safely for tens of thousands of years to fission products that only need to be stored safely for about 300 years. “Breeding is where you actually convert what’s called a fertile fuel—and thorium is one of these fertile fuels—you convert that into something which you can fission, and then you have to make sure that that process actually doesn’t stop—that it continues to create more and more new fuel,” Thomas Jam Pedersen, co-founder of Copenhagen Atomics, said as a guest on The POWER Podcast. “That’s what Copenhagen Atomics is trying to prove to the world—that it’s not merely something that you can show from physics that it’s possible, but you could actually also build it and make it work.” The concept is not new. MSRs—a class of reactors that use liquid salt, usually fluoride- or chloride-based, as either a coolant with a solid fuel or as a combined coolant and fuel with the fuel dissolved in a carrier salt—underwent significant testing in the 1950s and 1960s at the Oak Ridge National Laboratory (ORNL) in Tennessee. Subsequent design studies in the 1970s focusing on thermal-spectrum thorium-fueled systems established reference concepts for two major design variants, one of which was a molten salt breeder reactor with multiple configurations that could breed additional fissile material or maintain self-sustaining operation. One reason the testing stopped was because thorium is not well-suited for making nuclear weapons, so the military was not interested in investing in the technology. “It was, from the very get-go, far behind the investments in the uranium fuel cycle, and therefore, most people were educated in the uranium fuel cycle,” Pedersen said. In the late 2000s, that changed, because documents from the ORNL testing were released to the public. “People started to discover, ‘Oh, there’s actually something here that is quite exciting.’ Because thorium is the only element where you can make breeder cycle, or breeder reactor, in thermal spectrum, and thermal spectrum is sort of, you can say, the easy reactors to build,” Pedersen explained. Molten salt is an important part of the process because it allows fission products to be removed from the reactor during operation. In the past, corrosion was a serious problem when using molten salt, but with today’s advanced materials, it’s less of a concern and less expensive to control. “Back in the day, there was not that much material science, and it was difficult to make the salt clean enough that you could minimize the corrosion,” said Pedersen. “I think this is where we’ve gotten a step ahead now with modern technology.” Copenhagen Atomics’ goal is to have a 100-MWth (roughly 45-MWe) reactor unit available commercially by 2028. Units are expected to be built in a factory, using an assembly-line process, and will be roughly the size of a standard shipping container, which will allow them to be delivered easily to plant construction sites around the world. Customers would be able to install multiple units at a site to effectively create almost any size plant. “One of the problems with classical reactors is that they’re usually really, really big and built onsite, and are quite expensive, and take many years to build,” Pedersen said. “We started this company because we want to change that. We want to be able to deploy these reactors much faster. Our ambition is to build more than one every day.” The company expects to have a non-fission prototype unit ready for operation next year. “We will be able to test it—it’s a one-to-one scale model of the reactor—we will not be able to run fission inside, but we can start it up and we can pump the salt around and we can test all the systems—see that it’s working,” Pedersen said. Copenhagen Atomics is targeting 2025 to have a fully functioning demonstration reactor in operation. One additional advantage of the MSR is that molten salt is a great energy storage medium, so Pedersen said he envisions storage tanks at plant sites that will allow units to operate as baseload units, even in a renewable-filled market. “We plan to put all the output energy into that tank when, say, the wind is blowing. And then when the wind is not blowing, then you can both take the power from the reactor and you can take some of the additional power from those storage tanks.” The cost? “I think it’ll be a much cheaper energy form than classical nuclear reactors, and I think we can even compete with some of the cheapest forms of wind power or solar power,” said Pedersen. Furthermore, the thorium-fueled units will be dispatchable. “We can supply energy 24/7, and therefore, the value of our energy source is higher in the grid than it would be if you buy the same electricity from solar.”

#### Even if tech’s dangerous, it’s the only thing that stops massive die offs

Haeberlin, 4 – nuclear engineer, led the Nuclear Safety and Technology Applications Product Line at the Pacific Northwest National Laboratory (Scott, A Case for Nuclear-Generated Electricity, p. 31-40)

Well, then let's not do that, huh? Well, no, not hardly, because without that use of fertilizers we couldn't produce the food to feed the population. We just couldn't do it. Here are some comparisons."

If you used no fertilizers or pesticides you could get 500 kilograms of grain from a hectare in a dry climate and as much as 1000 kilograms in a humid cli­mate. If you got organic and used animal manure as fertilizer, assuming you could find enough, you might get as much as 2000 kilograms per hectare. For a sense of scale, the average in the United States, where recall we only get half the food value to hectare as the intensively farmed Chinese crop land, we get about 4500 kilograms per hectare on the average. In serious cornfields with fertilizer, irrigation, and pesticides, the value is 7000 kilograms per hectare.

Modern mechanized, chemically supported agriculture produces 7 to 14 times the food that you would get without those advantages. Even the best organic farming would produce only 30 to 45% of the food value you would get from the same sized chemically fertilized farm, and that is assuming you could get the manure you needed to make it work.

In very stark terms, without the chemically enhanced farming we would have probably something like one-fifth the food supply we have now. That means four-fifths the population would not be fed, at least as we are organized now. So, no, just giving up on fertilizers is not in the deal.

However, we could get the hydrogen and energy from sources other than natural gas. Nuclear energy could be used to provide electricity to extract hydrogen from water and produce the process heat required to combine the hydrogen and nitrogen from the air. That is just a thought to stick in your mind. While we are looking at energy use in agriculture, here are a few more numbers for you.10 If you look at the energy input into agriculture and the energy you get out, you see some interesting facts. By combining the energy used to make fertilizers and pesticides, power irrigation, and run the farm machinery in the United States, we use about 0.7 kcal of fossil fuel energy for each 1 kcal of food we make. This doesn't include the energy needed to process and transport the food. In Europe where they farm more intensely, the amount of energy out is just about the same as energy in. In Germany and Italy the numbers are 1.4 and 1.7 kcal energy input to each 1 kcal output respectively. The point is you need energy to feed people, well at least a lot of people.

Which gets us back to Cohen and his question. One of the studies he examined looked at a "self-sustaining solar energy system." For the United States, this would replace all fossil energy and provide one-fifth to one-half the current energy use. The conclusion of the study was that this would either produce" a significant reduction in our standard of living ... even if all the energy conservation measures known today were adopted" or if set at the current standard of living, "then the ideal U.S. population should be targeted at 40-100 million people." The authors of that study then cheerfully go on to point out that we do have enough fossil fuel to last a least a century, as long as we can work out the pesky environmental problems. So, you can go to a "self-sustaining" energy economy as long as you are willing to shoot between 2 out of 3 and 6 out of 7 of your neighbors.

And this is a real question. The massive use of fossil fuel driven agriculture to provide the fertilizers and pesticides, and power the farm equipment, is a) vitally important to feed everyone, and b) something we just can't keep up in a business-as-usual fashion. Sustainable means you can keep doing it. Fossil energy supplies are finite; you will run out some time. Massive use of fossil energy and the greenhouse gases they produce also may very well tip the planet into one of those extinction events in which a lot of very bad things happen to a lot of the life on the earth.

O.K. to Cohen's big question, how many people can the earth support? What it comes down to is that the "Well, it depends" answer depends on

• what quality of life you will accept,

• what level of technology you will use, and

• what level of social integration you will accept.

We have seen some of the numbers regarding quality of life. Clearly if you are willing to accept the Bangladesh diet, you can feed 1.8 times more people than if you chose the United States diet.

If you choose the back-to-nature, live like our hearty forefathers, level of technology, you can feed perhaps one-fifth as many people as you can with modern chemical fertilized agriculture. The rest have to go.

And here is the tough one. You can do a lot better, get a lot more people on the planet, if you just force a few things. Like, no more land wasted in growing grapes for wine or grains for whiskey and beer. No cropland used for tobacco. No more grain wasted on animals for meat, just grain for people. No more rich diets for the rich countries, share equally for everyone. No more trade barriers; too bad for the farmers in Japan and France, those countries would just have to accept their dependence on other countries for their food. It is easy to see that at least some of those might actually be a pretty good thing; however, the kicker is how do you get them to happen? After all, Mussolinill did make the trains run on time. How could you force these things without a totalitarian state? Are you willing to give up your ability to choose for yourself for the common good? It is not pretty, is it?

Cohen looked at all the various population estimates and concluded that most fell into the range of 4 to 16 billion. Taking the highest value when researchers offered a range, Cohen calculated a high median of 12 billion and taking the lower part of the range a low median of 7.7 billion. The good news in this is 12 billion is twice as many people as we have now. The bad news is that the projections for world population for 2050 are between 7.8 and 12.5 billion. That means we have got no more than 50 years before we exceed the nominal carrying capacity of the earth. Cohen also offers a qualifying observation by stating the "First Law of Information," which asserts that 97.6% of all statistics are made up. This helps us appreciate that application of these numbers to real life is subject to a lot of assumptions and insufficiencies in our understanding of the processes and data.

However, we can draw some insights from all of this. What it comes down to is that if you choose the fully sustainable, non-fossil fuel long-term options with only limited social integration, the various estimates Cohen looked at give you a number like 1 billion or less people that the earth can support. That means 5 out of 6 of us have got to go, plus no new babies without an offsetting death.

On the other hand, if you let technology continue to do its thing and perhaps get even better, the picture need not be so bleak. We haven't made all our farmland as productive as it can be. Remember, the Chinese get twice the food value per hectare as we do in the United States. There is also a lot of land that would become arable if we could get water to it. And, of course, in case you need to go back and check the title of this book, there are alternatives to fossil fuels to provide the energy to power that technology.

So given a positive and perhaps optimistic view of technology, we can look to some of the high technology assumption based studies from Cohen's review. From the semi-credible set of these, we can find estimates from 19 to 157 billion as the number of people the earth could support with a rough average coming in about 60 billion. This is a good time to be reminded of the First Law of Information. The middle to lower end of this range, however, might be done without wholesale social reprogramming. Hopefully we would see the improvement in the quality of life in the developing countries as they industrialize and increase their use of energy. Hopefully, also this would lead to a matching of the reduction in fertility rates that has been observed in the developed countries, which in turn would lead to an eventual balancing of the human population.

The point to all this is the near-term future of the human race depends on technology. If we turn away from technology, a very large fraction of the current and future human race will starve. If we just keep on as we are, with our current level of technology and dependence on fossil fuel resources, in the near term it will be a race between fertility decrease and our ability to feed ourselves, with, frankly, disaster the slight odds-on bet. In a slightly longer term, dependence on fossil fuels has got to lead to either social chaos or environmental disaster. There are no other end points to that road. It doesn't go anywhere else.

However, if we accept that it is technology that makes us human, that technology uniquely identifies us as the only animal that can choose its future, we can choose to live, choose to make it a better world for everyone and all life. This means more and better technology. It means more efficient technology that is kinder to the planet but also allows humans to support large numbers in a high quality of life. That road is not easy and has a number of ways to screw up. However, it is a road that can lead to a happier place, a better place.

Two Concluding Thoughts on the Case for Technology

Two more points and I will end my defense of technology. First, I want to bring you back from all the historical tour and all the numbers about population to something more directly personal. Let me ask you two questions.

What do you do for a living?

What did you have for breakfast?

Don't see any connection between these questions or of their connection to·the subject of technology? Don't worry, the point will come out shortly. I am just trying to bring the idea of technology back from this grand vision to its impact on your daily life.

Just as a wild guess, your answer to the first question was something that, say 500 years ago, didn't even exist. If we look 20,000 years ago, the only job was" get food." Even if you have a really directly socially valuable job like a medical doctor, 20,000 years ago you would have been extraneous. That is, the tribe couldn't afford you. What, no way! A doctor could save lives, surely a tribe would value such a skill. Well, sure, but the tribe could not afford taking one of their members out of the productive */I* getting the food" job for 20 years while that individual learned all those doctor skills.

If you examine the "what you do for a living" just a bit I think you will see a grand interconnectedness of all things. I personally find it pretty remarkable that we have a society that values nuclear engineers enough that I can make a living at it. Think about it. Somehow what I have done has been of enough value that, through various taxpayer and utility ratepayers, society has given me enough money for food and shelter. The tribe 20,000 years ago wouldn't have put up with me for a day.

You see, that is why we as humans are successful, wildly successful in fact. We work together. "Yeah, sure we do," you reply, " read a newspaper lately?" Well, *O.K.,* we fuss and fight a good deal and some of us do some pretty stupid and pretty mean things. But the degree of cooperation is amazing if you just step back a bit.

O.K., what did you have for breakfast: orange juice, coffee, toast, maybe some cereal and milk? Where do these things come from? Orange juice came from Florida or California. Coffee came from South America. Bread for the toast came perhaps from Kansas; cereal, from the Mid-West somewhere. The jam on the toast may have come from Oregon, or maybe Chile. Milk is probably the only thing that came from within a hundred miles of your breakfast table. Think about it. There were hundreds of people involved in your breakfast. Farmers, food-processing workers, packaging manufacturers, transportation people, energy producers, wholesale and retail people. Perhaps each one only spent a second on their personal contribution to your personal breakfast, but they touch thousands of other people's breakfasts as well. In turn, you buying the various components of your breakfast supported, in your part, all those people. They in turn, in some way or another, bought whatever you provide to society that allowed you to buy breakfast. Pretty amazing, don't you think?

Now when you look at all that, think about what ties all the planetwide interconnection, Yep, you guessed it: technology. Without technology, you get what is available within your personal reach, and what you produce is available only to those who are near enough that you can personally carry it to them on your own two feet. Technology makes our world work. It gives you personally a productive and socially valuable way to make both a living and to provide your contribution to the rest of us**.**

I want you to stop a minute and really think about that. What would your life be like without technology? Could you do what you currently do? Would anyone be able to use what you do? Would anyone pay you for that? "But I am a school teacher," you say, "of course, they would pay me!" Are you sure? Why do you need schools if there is no technology? All I need is to teach the kid how to farm and how to hunt. Sons and daughters can learn that by working in the fields along with their parents. See what I mean?

Now, I have hopefully reset your brain. Sure, you are still going to be hit with daily "technology is bad" messages. Hopefully, you are a bit more shielded against that din, and you have been given some perspective to balance that message and are prepared to see the true critical value of technology to human existence. The point is that technology is what makes us human. Without it, we are just slightly smarter monkeys.

You may feel that 6 billion of us are too many, and that may very well be. I personally don't know how to make that value decision. Which particular person does one select as being one of the excess ones?

However, the fact is that there are 6 billion of us, and it looks like we are headed for 10 to 12 billion in the next 50 years, Without not only the technology we have, but significantly better and more environmentally friendly technology, the world is going to get ugly as we approach these numbers,

On the other hand, with the right technologies we can not only support those numbers, we can do it while we close the gap between the haves and have-nots. We can make it a better place for everyone. It takes technology and the energy to drive it. Choosing technology is what we have to do to secure the evolutionary selection of us as a successful species, Remember, some pages back in discussing the unlikely evolutionary path to us, I said we are not the chosen, unless. Unless we choose us. This is what I meant. We are totally unique in all of evolutionary history. We humans have the unique ability and opportunity to choose either our evolutionary success or failure. A choice of technology gives us a chance. A choice rejecting technology dooms us as a species and gives the cockroaches the chance in our place. Nature doesn't care what survives, algae seas, dinosaurs, humans, cockroaches, or whatever is successful. If we care, we have to choose correctly.

As an aside, let me address a point of philosophy here. If any of this offends your personal theology, I offer this for your consideration. Genesis tells us God gave all the Earth to humanity and charged us with the stewardship thereof. So it is ours to use as well as we can. That insightful social philosopher Niccolo Machiavelli put it this way in 1501:

"What remains to be done must be done by you; since in order not to deprive us of our free will and such share of glory as belongs to us, God will not do everything Himself."

*O.K.,* you are saying, "I give." You have beaten the socks off me. Technology is good; technology is the identifying human trait and our only hope. But what is this stuff about choosing technology or not? Technology just happens doesn't it? I mean, technology always advances, it always has, so why the big deal?

#### Thorium, innovation, and recycling minimize REM mining

Martin and Iles 2020 (Abigail Martin, Ph.D. in Environmental Science, Policy and Management from the UC Berkeley, Research Fellow at the Science Policy Research Unit, University of Sussex Business School; Alastair Iles, SJD in Environmental law and policy from Harvard, 2020, "The Ethics of Rare Earth Elements Over Time and Space," HYLE--International Journal for Philosophy of Chemistry, Vol. 26, No. 1 (2020), pp. 5-30., http://www.hyle.org/journal/issues/26-1/martin.htm)

5.1 Reducing and replacing REEs Some large industries that use REEs discovered during the 2010 supply scare that they could do without some of them. When the price of lanthanum soared, oil refinery operators temporarily stopped using this rare earth even though it improves refining efficiency. The glassmaking industry largely abandoned using cerium for polishing. More may be done to find designs that keep REE use to the minimum. However, many REEs needed for high-technology products have no or low potential for adequate substitution with other materials (Graedel et al. 2015). For example, dysprosium (used in permanent magnets in computers and wind turbines), europium and yttrium (used in flat panel displays), and thulium and ytterbium (used in laser technologies) do not have straightforward substitutes available. The lack of replacements suggests sharply increasing recycling is one strategy for REE supply chains, which requires implementing a circular flow of REE material through different stages in a product’s lifecycle, from design, to end-of-life collection, to separation and recycling. 5.2 Innovations to REE manufacturing and bypass mining Some industries that rely on REEs are looking for ways to bypass mining entirely by extracting REEs from other materials. For example, the US could someday obtain these elements as byproducts from power plant coal ash and coal mining waste. And the problem of radioactive material mixed in with ores could end up being positive: If thorium-based nuclear plants prove viable, expanded thorium mining would also turn up usable rare earth minerals. However, insofar as such innovations rely on energy production that poses significant risks to local communities, these approaches cannot satisfy the requirements of environmental justice, let alone intergenerational justice. 5.3 Circular economies for REE recovery and recycling Recovering and recycling rare earth metals is one possible way of avoiding the ongoing environmental and intergenerational injustices of mining. However, only a very small proportion of REEs becomes recycled from products, some estimating less than 1% (Binnemans et al. 2013). One reason is that the amount of rare earth elements that can be recovered from electronics, medical devices, and similar applications is very small, often less than one gram (Bonawandt 2013). Typically, recycling requires that rare earths be separated from metals and alloys created with REEs. For instance, the Japanese mining company Dowa began harvesting circuit boards, hard drives, computer chips and other components for rare earth metals by cutting these components into 2 cm squares, smelting them at 1,400° C, which enables separation of the various components. For every 300 tons of e-waste smelted, the harvestable rare earth material is only about 150 grams. Although REEs are valuable, Dowa would not be profitable were it not for other materials, such as gold, silicon, etc. (Tabuchi 2010). Another issue is that there is no standard method of recycling REEs, and the processes for doing so are considerably costly and environmentally hazardous – some on par with mining. Several efforts are underway to make REE recycling more efficient (Harler 2018). Researchers working under the US Department of Energy’s Critical Materials Institute have focused on developing a single-step process to recover REEs from scrap magnets in order to recover the ores from hard drives, magnetic resonance imaging machines, cell phones, and hybrid cars (ORNL 2019). For instance, using membrane solvent extraction, about 3 kilograms of magnets can yield about 1 kilogram of rare earth metals. Other US researchers have been improving an older method of isolating REEs from magnets and scrap metals using molten magnesium (Bonawandt 2013). Researchers in Belgium are using ionic liquids to separate REEs from magnets, a process that uses trihexyl(tetradecyl)phosphonium chloride to transform metals like iron, cobalt, magnesium, and copper into a liquid phase, leaving the rare earths behind in an aqueous state. Researchers at Japanese car manufacturer Honda have found a way to extract rare earths from nickel-metal hydride batteries from hybrid vehicles by using molten salt, and claim as much as 80 percent of REEs being recycled. In addition to these separation challenges, there are also challenges in handling reclaimed REEs due to their air reactivity, which can render them into oxides if left out in the open for too long. Manufacturing blended REE materials is one alternative to the challenges of purification and the relatively small amounts of pure REE that can be recovered from many products. For instance, scientists and engineers working at Momentum Technologies and the DOE’s Critical Materials Institute are producing a blended REE product from recovered hard drives and other technology waste (Harler 2018). After extracting iron and boron, the recovered rare earth metal product includes a mixture of neodymium, dysprosium, and praseodymium. Technology companies and other manufacturers may be willing to take this blended product that combines all three REEs as long as the material meets manufacturing requirements. One strategy for enhancing the profitability would be to target REE recovery and recycling initiatives in supply chains with much larger REE quantities. For instance, it may be more profitable to work with the REEs in specific supply chains, such as sustainability technologies like wind turbines and electric cars or specific consumer electronics. Some argue that recycling of e-waste will have little impact on REE supplies until there is enough material in the recycling stream to keep up with REE demand. This assumes that manufacturers’ only recourse is to wait for a steady flow of recycled REEs to become available for purchase on the world market. However, the recycling of REEs can also be pursued at the firm or industry level through a circular economy approach. The term ‘circular economy’ refers to ‘close the loop’ business models that replace the ‘take-make-dispose’ models, or what some now call the ‘linear economy’. Individual firms could take a product-centric approach to closing the loop for REE reuse as well. A closed-loop system developed internally would keep REEs and other materials in circulation for as long as possible. This would mean that downstream manufacturers, product designers, engineers, and business take control of their upstream REE supply chains, re-circulating REEs rather than purchasing mined REEs or waiting for a sizable market of recycled REEs to develop. Such product-centric design approaches require attention to disassembly: designers and engineers must understand how complex products break down into component parts and how particular materials behave in order to design products for easy separation. For instance, the circuit board of an electronic product may be redesigned so that its metals are easily removed from other plastic, aluminum, and steel parts. Product-centric recycling systems must be designed by those with knowledge of the chemical and physical properties of waste containing REEs, physical separation methods, physical and chemical recycling methods, as well as the thermodynamics of a specific plant’s processing to assess material performance with regard to energy efficiency, durability, and manufacturing compatibility, in addition to recyclability (UNEP 2013, Kaya 2016). Liberation modeling is an important tool in this regard because it focuses on defining recyclate grades in a way that allows a common language to develop among engineers, policy specialists, and environmentalists about the trade-offs of different design approaches (UNEP 2013). Policymaking has an important role to play here. Product-centric design for a circular economy must be undertaken in collaboration with policymakers as well as planning and recycling professionals who can help design collection systems for waste products and discourage informal or illegal disposal. Producer-responsibility laws, recycling targets, and other policy-based incentives can help to incentivize circular economy innovations from specific manufacturers and entire industries. For instance, the 2012 European Parliament law to reduce electronic waste requires member states to collect 45 tons of e-waste for every 100 tons of electronic goods sold in the previous three years, which has pushed companies and governments to develop better collection systems. In 2015, the European Commission launched its Action Plan on the Circular Economy, which aims to go further by pushing companies to re-design products to be durable and made with materials that can be re-used again and again.

#### It’s a link to the status quo—coal is way worse

David R. Boyd 21, UN Special Rapporteur on human rights and the environment, PhD in Resource Management and Environmental Studies from the University of British Columbia and a law degree from the University of Toronto, 10/29/2021, “Joint Statement by UN human rights experts - Accelerate the end of the coal era to protect human rights,” https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E

In light of recent reports from the Intergovernmental Panel on Climate Change, the International Energy Agency, the UN Environment Programme and UNICEF, the evidence regarding the outsized contribution of coal mining and combustion to causing and aggravating the global climate emergency is clear and compelling. The mining and combustion of thermal coal has devastating impacts on human health and well-being and must end. Coal use interferes with the enjoyment of a range of human rights including the rights to a safe, clean, healthy and sustainable environment, to life, to health, and with the rights of the child and the rights of Indigenous peoples.[1](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn1) Because of its immense generation of greenhouse gases, continued reliance on coal would make the commitments made in the Paris Agreement—to limit global warming to 1.5°C to 2°C—impossible to achieve.[2](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn2) The logical conclusion is that coal must be phased out as quickly as possible. Recent scientific studies confirm that reliance on coal must be eliminated.[3](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn3) The human right to science, which requires alignment of policy measures with best available scientific evidence, reinforces the need to accelerate the end of the coal era.[4](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn4) Coal-fired electricity is the largest source of global greenhouse gas emissions (carbon dioxide and methane), a major contributor to air pollution that kills millions of people annually, and a major polluter of water with toxic substances. Stationary coal burning for power accounts for 21% of the 2220 tonnes of anthropogenic sources of mercury emissions to the atmosphere annually, according to the UN Environment Programme’s 2018 Global Mercury Assessment. Combustion of coal for power generation is also a major source of toxic ash, which pollutes water and exposes fenceline communities to hazardous substances. The International Energy Agency reported in 2021 that to achieve net zero emissions by 2050, all countries need to immediately stop construction of any new coal power plants, phase them out completely by 2030 in advanced economies and close all of them by 2040 globally.[5](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn5) The most recent global climate assessment (AR6) of the Intergovernmental Panel on Climate Change, released earlier this year, concluded that the evidence human activities have caused global warming is unequivocal and that the climate crisis is already contributing to more frequent and severe extreme weather events, floods, and wildfires as well as slow onset disasters such as drought and sea level rise.[6](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn6) UN Secretary-General Antonio Guterres described the AR6 report as “code red for humanity”. The UN Environment Program’s Emissions Gap Report (2020) notes that the COVID-19 pandemic is a warning from nature that we must act on climate change, nature loss and pollution. UNEP’s report identifies measures for a recovery that put the world on a pathway consistent with the Paris Agreement, including no new coal plants and phasing out of existing coal-fired power plants. Opportunities for ending reliance on coal are enhanced by the loss of competitiveness of coal vis-à-vis renewable technologies.[7](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn7) UNICEF reported that almost one billion children are living in regions facing extreme adverse effects related to climate change.[8](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn8) UN High Commissioner for Human Rights, Michelle Bachelet, has said that “The world has never seen a human rights threat of this scope.” Earlier this year, the G7 made a strong commitment to accelerate the transition away from coal, including a clear pledge to end international coal finance by the end of 2021.[9](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn9) In addition, more than forty States have already joined the Powering Past Coal Alliance, committing themselves to 1) stop building new coal-fired power plants, 2) phase out existing coal-fired power plants, and 3) terminate all forms of financial support for coal.[10](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn10) These three commitments need to be made by all nations in order to successfully address the intertwined global environmental crises of climate change and air pollution. To their credit, a group of OECD nations recently announced that they will end financial support for unabated coal-fired power plants.[11](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn11) While some elements of this agreement are a step forward, safeguards will nevertheless be needed to prevent risks to the environment and human rights from financing for unproven carbon capture storage technologies associated with coal-fired power plants. China recently made a laudable commitment to stop building and financing coal-fired power plants in foreign countries. It needs to supplement that pledge with an end to the construction of new coal plants in China. Unethically, sixty of the world’s largest banks have reportedly invested more than $300 billion in coal mining and coal power since 2016, led by ten Chinese banks, Citi, MUFG, Credit Suisse and JP Morgan.[12](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn12) Also, fossil fuel companies and extractive industries are harassing and attacking climate justice activists.[13](https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27740&LangID=E" \l "_edn13) Private investment in coal and harassment of environmental defenders must also cease in order for businesses to fulfill their responsibilities under the UN Guiding Principles on Business and Human Rights.

#### Psychoanalysis does not justify the immutability of settler colonial ontologies. Generative futurity is good.

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Apprehending this history as what Jodi Byrd has called the “transit” over which the international “postwestern” cityscape of Las Vegas is realized leads us into a reading of a very different type of frontier than the one memorialized on Fremont Street (Transit xv). Read this way, as a site of Indigenous dispossession, the West cannot be seen as a dynamic site of pure possibility, as Gilles Deleuze and Félix Guattari have represented it, as “a rhizomatic West, with its Indians without ancestry, its ever- receding limit, its shifting and displaced frontiers” (19). The repetitive revisitation of frontier tropes recalls what critic Hamish Dalley calls “the frozen temporality of settler- colonial narrative,” which, “fixated on the moment of the frontier, recalls nothing so much as Freud’s description of the ‘repetition compulsion’ attending trauma” (Dalley). The “hyperreal West” in this context emerges as a fantasy (Lewis 194), in the sense that theorist Jacqueline Rose describes in her work on Israel/Palestine. “Never completely losing its grip, fantasy is always heading for the world it only appears to have left behind” (3).5 Of course settler colonialism is but one of the “secret histories of Las Vegas” that underwrite the postmodern wonderland visitors fi nd on Fremont Street and the strip, and but one of many structures of violence that shape life in the contemporary western United States.6 Nonetheless, it remains a structure central to the consideration of “westness.” As the postwestern critics argue, “westness” is neither contained by geography (as the popularity of the Western genre internationally attests), nor necessarily representative of cultural production being produced within the western United States (Kollin x– xi). When we speak of a cultural production as “Western,” we are speaking of a work that addresses the process and consequences of settler conquest, whether we are discussing a California memoir, an Australian novel, or an Italian fi lm.7 This is not to say that Western cultural production is always a result of settler colonial ideology, but rather that it is engaged with questions pertaining to it. Th e problem of the West is, in a crucial sense, the problem of settler colonialism. Imagining postwestern futures thus requires a critical outlook that is more than just inclusive in its politics, transnational in its scope, and poststructuralist in its methodology. Our movement toward the “post” in the conceptual space of the Western must be decolonial in its orientation. Such a critique would abandon unilateral settler attempts at postnational place-making in order to critique settler colonial structures of violence. Such a critique would not work to reify these structures as permanent or inevitable, but rather to probe their contradictions, and to promote the Indigenous intellectual traditions that have long been at work critiquing the settler colonial present in order to shape a decolonial future.8 We hope that this special issue of Western American Literature, which features critical readings of western American film and literature by three scholars from different fields and national backgrounds, can contribute toward this effort.

#### Imagining possible futures is key to indigenous environmental organizing.

Anne Spice 16, Tlingit member of Kwanlin Dun First Nation and a doctoral student in anthropology at the CUNY Graduate Center, A History and Future of Resistance, <https://www.jacobinmag.com/2016/09/standing-rock-dakota-access-pipeline-protest/>

The struggle against the Dakota Access Pipeline is rooted in this history. Indeed, the pipeline violates the same treaty that underwrote the AIM occupation of Wounded Knee. And just as AIM demanded respect for the treaties and indigenous sovereignty, the Standing Rock Sioux are demanding that the Fort Laramie Treaty be honored and the land and water be protected. The people who have endured centuries of dispossession and attempted elimination — the poorest of the poor, the most likely to be killed by law enforcement, the most easily forgotten — are still here and still fighting. They have built alternatives within and beyond capitalism for hundreds of years. They are the carriers of traditions of indigenous resistance and resurgence simultaneously rooted in Lakota land and history, and global in scope. In recent decades, this struggle has been threatened by neoliberal cooptation. Repelled by a colonizing state, many indigenous groups found themselves in an uneasy alliance with neoliberals who denounced “big government” and jumped at the opportunity to slash the welfare state and restructure tribes as junior corporate partners in the global economy. “Tribal sovereignty” became increasingly conflated with owning and profiting from an Indian casino. Yet despite the absence of a free-market critique in some indigenous circles, Standing Rock and other actions have emerged as exemplary counterweights to this pernicious drift. And elsewhere, indigenous land protectors are also navigating the currents of globalization to great effect. The Unist’ot’en camp in northern British Columbia has, thus far, blocked construction of numerous potential and proposed pipelines through their territory, building a space where indigenous lifeways can persist on lands defined by industry as an “energy corridor.” In Minnesota, the energy company Enbridge recently shelved plans for the Sandpiper pipeline, partially in response to tribal opposition. And the Obama administration nixed the Keystone XL Pipeline, after facing enormous pressure from tribes and their allies. In each of these instances, indigenous peoples are more than cameo extras. They are central protagonists in the fight against the forces of capitalist expansion, who would destroy the land and water, and trample indigenous sovereignty, all for the purposes of resource extraction. At Standing Rock, disparate tribes have set aside differences and come together as one. People from indigenous nations across the continent have travelled thousands of miles to stand with them. Indigenous people are rallying in support from New York City to San Francisco. Together, they are envisioning a future without a Dakota Access Pipeline, and enacting a future where indigenous nations exercise their rights to define a more just, equal, and sustainable path forward, as stewards of land, water, humanity, and each other. At Standing Rock, the audacious vision for an indigenous future, handed down from Wounded Knee and global in force, is alive and well. This is how you Ghost Dance in 2016.

#### Psychoanalysis is unfalsifiable---prefer social science because it can explain patterns between causal factors

Brian McConachie 7, Chair of Theatre Arts at the University of Pittsburgh, "Falsifiable Theories for Theatre and Performance Studies", Theatre Journal 59.4 (2007), 553-577, MUSE

Can the master theorists in our critical theory consensus make the same claim? All scientific assertions are potentially falsifiable through the use of the scientific method, but what experiments or logics would the master theorists accept as a basis for the falsifiability of their ideas? Looking at the theorists featured in Critical Theory and Performance, one might say that they represent a range of approaches that admit of greater or lesser degrees of falsifiability. At one end of the continuum, the theories of Bourdieu, Habermas, Gramsci, and Williams generally work within the falsifiability protocols of social science, which (though open to dispute) have been fairly well established for fifty years. When Raymond Williams's version of Gramsci's hegemony theory was gaining a curious audience among historians, its potential falsifiability was widely discussed.46 While social scientists, including historians, cannot apply falsifiability to their work with the same rigor as scientists who work with nonhuman subjects, their standards concerning evidence, economy, and consistency are high.47 Somewhere in the middle of the continuum of falsifiability, perhaps, are the psychoanalytic theories of Freud, their synthesis with semiotics in Lacan, and the many theorists who build their own ideas on some version of a psychoanalytic base. Their advocates often claim scientific validity for these theories. Most psychologists, however, have rejected psychoanalysis and its spin-offs as unfalsifiable. In her Psychoanalysis and Cognitive Science, for example, Wilma Bucci concludes that Freud's meta-psychology has not "been subject to the empirical evaluation and theory development that is necessary for a scientific field." Specifically, the type of systematic inference that is applied in cognitive science and in all modern science requires explicit definitions that limit the meaning of the concepts, correspondence rules mapping hypothetical constructs and intervening variables onto observable events, and means of assessing reliability of observation. Each of the indicators that analysts rely on to make inferences about the conscious and unconscious states of other persons (as [End Page 571] about one's own conscious states) must itself be independently validated as having the implications that are assumed.48 In defense, Freudians and Lacanians often claim that their theories are consonant with good science because their concepts have been scientifically validated in therapeutic sessions.49 But clinical success, however it is measured, is not the same as empirical verification. Just because "the talking cure" has been effective in some cases does not mean that Freud's or Lacan's explanation for why it worked is valid. Humans have had many explanations for fire over the centuries, but understanding why and how combustion really works must rely on recent physics and chemistry. At the other end of the continuum are theorists such as Baudrillard, Derrida, Féral, and other poststructuralists, whose radical skepticism challenges the ability of science or any other discourse to provide a valid standard of falsifiability. The relativism of poststructuralism, including its challenges to empirical verification, defies any protocols that might stabilize knowledge based on the slippery signifiers provided by language. Despite what they take to be the inherent contradictions of textual assertions, poststructuralists from Lyotard to Derrida rely chiefly on logic and argumentation rather than scientific or historical evidence. Within the assumptions of poststructuralism, Derrida's gnomic remark, "There is nothing beyond the text," is simply unfalsifiable. The critic who wishes to rely on what Derrida might have meant in that statement, however, will have to ignore a great deal of good science in linguistics and evolutionary psychology to be able to assess the probable truth of Derrida's assertion.50 Brian Vickers challenges the weak scientific credentials of several of the master theorists that many humanist academics have embraced. As he points out with acerbity: Freud's work is notoriously speculative, a vast theoretical edifice elaborated with a mere pretense of corroboration, citing "clinical observations" which turn out to be false, with contrary evidence suppressed, data manipulated, building up over a forty-year period a self-obscuring, self-protective mythology. The system of Derrida, although disavowing systematicity, is based on several unproven theses about the nature of language which are supported by a vast expanding web of idiosyncratic terminology. . . . Lacan's system, even more vastly elaborated . . . is a series of devices for evading accountability. . . . Foucault places himself above criticism.51 Whether all of Vickers's charges are valid may be less important than his general point: he presents suggestive evidence that these master theorists tried to place their ideas beyond the protocols of falsifiability.

#### Progress is possible--- legal strategies are key

NoiseCat 2016

11.24.2016 Julian Brave NoiseCat is an enrolled member of the Canim Lake Band Tsq'escen in British Columbia and a graduate of Columbia University and the University of Oxford “The Indigenous Revolution” https://www.jacobinmag.com/2016/11/standing-rock-dakota-access-pipeline-obama

Many Americans, Canadians, Australians, and New Zealanders believe that indigenous people are long gone and defeated. Inheritors of the imperial myth of “Manifest Destiny,” they presume the colonizers’ victory was inevitable and even predetermined. This racist myth has led empires and states to underestimate indigenous power.

Global histories of indigenous resistance, survival, and resurgence tell another story. On these Oceti Sakowin plains in 1876, a cocksure General Custer rushed into the Battle of the Little Bighorn only to be soundly defeated by allied Lakota, Cheyenne, and Arapaho forces. Dalrymple appears poised to repeat Custer’s mistake.

Countless indigenous communities, nations, and confederacies from the Americas to Australasia, and South Africa to Siberia, including Aboriginal Australians, Apache, Arapaho, Cherokee, Cheyenne, Chukchi, Comanche, Cree, Creek, Diné, Hawaiian, Haudenosaunee, Kiowa, Maori, Modoc, Nez Perce, Pueblo, Salish, Sauk, Seminole, Shawnee, Tasmans, Tlingit, Ute, Xhosa, Yakima, Zulu, and others have resisted imperial powers and industrial states and prevailed.

Before defeating Custer, the Oceti Sakowin had a long history of settler handling. In 1862, the Dakota pushed thousands of settlers off the Minnesota frontier. Six years later, the Lakota defeated the United States Army in Red Cloud’s War.

Retribution followed many indigenous victories. In California, entire communities were hunted like animals. After taking dozens of Dakota men as prisoners of war following the uprising of 1862, Abraham Lincoln signed an order to execute thirty-eight of them — the largest mass execution in American history. Later in 1890, the United States Army gunned down three hundred Lakota at Wounded Knee.

This history continues to devastate. Indigenous people remain the poorest of the poor and the most likely to be killed by law enforcement. Four of the fifteen most impoverished counties in the United States include Lakota reservations in South Dakota. The two poorest, Oglala Lakota and Todd County, lie entirely within the Pine Ridge and Rosebud reservations, where half of all residents live in poverty. In Ziebach County, which includes parts of the Standing Rock and Cheyenne River reservations, 45 percent of the population lives at or below the poverty line.

Elsewhere in the United States, Canada, Australia, and New Zealand, indigenous people are among the poorest, most oppressed, and least visible. They are overrepresented in prisons and underrepresented in universities. Their economic realities are bleak. Their pain is intergenerational.

In short, colonialism endures.

Yet these same communities are uniquely positioned to resist unjust systems and force them to retreat. We must hold these two seemingly contradictory realities of devastation and resilience in our minds at the same time. The Fourth World lives in devastation. The Fourth World is unconquered and on the rise.

Since the 1970s, indigenous people in the United States, Canada, Australia, and New Zealand have danced impressive victories. They have compelled states to forego assimilationist policies like the involuntary removal of indigenous children to abusive residential schools and the relocation of indigenous workers to cities. Overtly coercive policies have been slowly and steadily replaced with policies that recognize indigenous rights to land, jurisdiction, and sovereignty. Gains are limited, but they are still gains.

At certain times over the past thirty years, indigenous claims have prevented corporations from exploiting natural resources. In New Zealand in the 1980s, Maori claims under the Treaty of Waitangi stopped a state drive to privatize fisheries and hydroelectric power. In Canada and Australia, from the 1990s to the present, aboriginal claims have increased risk for prospective investors in extractive industries.

But the dance with the state can be perilous. In recent decades, some indigenous groups mistook neoliberals who denounced “big government” for allies. They accepted land claims settlements, treaty agreements, and business deals that enabled states to slash social services for the most vulnerable while restructuring indigenous communities as junior corporate partners in the global economy.

As Trump prepares to take power in the US and Brexit changes the economic calculus in Britain and across the world, it is clear that the dance with the state is entering a new age.

The New Colonialism

The new age has precedents.

Any Howard Zinn reader knows that the United States is built on stolen land with stolen labor. However, this is an observation too imprecise to help us understand and predict the trajectory of a global political economy steered and shaped by the likes of Trump and Nigel Farage. If you squint hard enough, Jack Dalrymple might look like a young George Custer, but that does not make him so.

To prevail, indigenous people and the Left must fully understand the precise ways that emerging systems will dispossess indigenous communities. In the nineteenth century, the United States Army incarcerated indigenous people on reservations, claimed land for homesteaders, protected prospectors, and cleared the way for railroad barons. In the 1960s, a different set of historical, political, and economic forces erected the Lake Oahe Dam on the Missouri River, flooding two hundred thousand acres of the Standing Rock reservation to provide power to suburban homeowners.

Today, the drive for independence from OPEC sees a solution in hydraulic fracturing technology. North American oil fields and infrastructure are funded by a financial system that encourages speculation, drives massive inequality, and fails to account for costs associated with human and environmental risks — passing these very real risks and consequences on to communities, workers, and indigenous nations. Inherently unaccountable capitalists are paid big money for being even more unaccountable, and indigenous dispossession continues on new frontiers.

Preliminary post-election forecasts indicate that Trump’s victory and Brexit will redirect capital back toward the American West and the British Commonwealth.

In particular, Trump — a DAPL investor himself — will expedite completion of DAPL and similar projects. He will push to reopen and complete the Keystone XL Pipeline. If he keeps his campaign promises, he will support infrastructure projects and extractive industries, including coal and fracking, in indigenous homelands across the American hinterlands.

At the same time, a conservative Supreme Court, an Interior Department led by Sarah Palin or oil baron Lucas Forrest, and a Justice Department led by Jeff Sessions means limited but hard-won Native rights will be rolled back. If this gang of reactionary appointees can’t figure out how to dismantle complex legal precedents, they can just cut funding to essential services like housing, schools, and health care that are already woefully underfunded, putting tribes in a stranglehold of austerity. Native resistance will be policed by Orwellian surveillance systems finely tuned by the Obama administration. Militarized law enforcement will find reinforcements in the booming private security and prison industries.

Surveillance, state law enforcement, and private security will drive mass arrests, as we’re seeing at Standing Rock. Law enforcement will have more power than ever to quash protesters and silence dissent.

In the former British Wests of Canada, Australia, and New Zealand, where the right-wing populist revolution has yet to take hold in the same way, suppression of indigenous resistance may be less visibly coercive — perhaps with the exception of skyrocketing policing, incarceration, and deaths-in-custody of indigenous people, particularly Aboriginal Australians (the “most imprisoned people in the world”).

Politicians in the Commonwealth will look to roll back or restructure indigenous rights won over the last three decades in ways that are favorable to capital.

Governments, like Justin Trudeau’s Liberals in Canada, are already abandoning campaign promises to indigenous people, opting instead to grab land and resources (as seen in the ham-fisted effort to force through the Site C Dam against indigenous opposition). Trudeau’s minister of natural resources has already stated that Canada will no longer ask First Nations for consent before going forward with lucrative natural resource projects like Kinder Morgan’s Trans Mountain Expansion project and Enbridge’s Northern Gateway pipelines.

In Australia, the government is steamrolling the Wangan and Jagalingou peoples’ Native Title claims in order to move forward with the massive Carmichael Coalmine in Queensland.

With the Commonwealth clamoring to cash in on opportunities created by Brexit, new free trade deals with the United Kingdom will be struck, resuscitating and rebuilding the capital networks of the former British Empire, previously weakened by globalization and the European Single Market. The Tory dream of a revived Anglosphere, long derided as fanciful, nostalgic, and bad business by Liberals, may even emerge as a legitimate principle and framework of international relations and trade. It will compete with increasingly powerful Chinese and Indian capital throughout the Commonwealth, as already witnessed in the Canadian tar sands, Australian coalmines, and New Zealand real estate and dairy.

Combined with the rise of China and India, this will bring new waves of exploitive capital into indigenous homelands, along with increased policing and the dismantling of indigenous rights.

Renewed colonial and capitalist pressure on indigenous people means that the Fourth World’s adversarial relationship with the state will become more central to the struggle to transform political and economic systems for all. If the history of the indigenous dance with the state is any indication, the Fourth World will suffer tremendously while at the same time standing athwart the forces of capitalism and exploitation.

The Left must stand with the Fourth World in our collective struggle.

The Fourth World and a Fourth Way

On November 14, the Army Corps of Engineers temporarily halted DAPL’s progress, stating that “the history of the Great Sioux Nation’s dispossessions of lands” and the United States’ “government-to-government” relationship with indigenous nations demanded that the route of the proposed pipeline be reassessed. The Army told Energy Transfer Partners (ETP), the company building DAPL, that construction beneath the Missouri River required explicit approval, and asked the Standing Rock Sioux to negotiate conditions for the pipeline to cross tribal territory. Faced with a momentary victory for Standing Rock, Kelcy Warren, Dallas billionaire and CEO of ETP, denounced the decision as “motivated purely by politics at the expense of a company that has done nothing but play by the rules.”

Warren was right. Had it not been for thousands of people mobilizing behind an indigenous-led coalition, DAPL would have been business as usual. ETP would have desecrated the graves of Standing Rock ancestors unimpeded. Workers, lured by relatively high wages, would have taken on toxic and insecure work. The tribe’s hunting and fishing grounds would have been jeopardized, and if the pipeline leaked, Standing Rock and its downstream communities would have been poisoned. Environmental degradation and runaway climate change would have pressed ahead unabated. Carbon dependency would have become even more deeply engrained in our political economy. Eventually, ETP and their investors would have cashed out, and future generations would have been robbed.

And all of this still will happen if President Obama doesn’t heed the water protectors and instead sides with ETP.

ETP spent $1.2 million over the last five years paying politicians to legislate in its favor. Warren personally donated $103,000 to the Trump campaign. But when indigenous people organized, turning to direct action and the law to pressure elected officials and government systems, they wrested power from ETP’s hands.

DAPL is just one chapter in a much longer story of indigenous resistance to, and victories against, pipelines across North America. In 2015, the Obama administration nixed the Keystone XL Pipeline, yielding to pressure from the Cowboy Indian Alliance. In Minnesota, Enbridge shelved plans for the Sandpiper pipeline, after encountering tribal opposition. The Unist’ot’en camp in northern British Columbia has held out against numerous proposed pipelines through their territory, building a space where indigenous sovereignty stands tall on lands defined by industry as an “energy corridor.”

#### No mindset shift and collapse destroys the environment

Mead, 12 --- Professor of Foreign Affairs and Humanities at Bard College (7/28/2012, Walter Russell, “The Energy Revolution 4: Hot Planet?” <http://blogs.the-american-interest.com/wrm/2012/07/28/the-energy-revolution-4-hot-planet/>)

Capitalism is not, Monbiot is forced to admit, a fragile system that will easily be replaced. Bolstered by huge supplies of oil, it is here to stay. Industrial civilization is, as far as he can now see, unstoppable. Gaia, that treacherous slut, has made so much oil and gas that her faithful acolytes today cannot protect her from the consequences of her own folly. Welcome to the New Green Doom: an overabundance of oil and gas is going to release so much greenhouse gas that the world is going to fry. The exploitation of the oil sands in Alberta, warn leading environmentalists, is a tipping point. William McKibben put it this way in an interview with Wired magazine in the fall of 2011: I think if we go whole-hog in the tar sands, we’re out of luck. Especially since that would doubtless mean we’re going whole-hog at all the other unconventional energy sources we can think of: Deepwater drilling, fracking every rock on the face of the Earth, and so forth. Here’s why the tar sands are important: It’s a decision point about whether, now that we’re running out of the easy stuff, we’re going to go after the hard stuff. The Saudi Arabian liquor store is running out of bottles. Do we sober up, or do we find another liquor store, full of really crappy booze, to break into? A year later, despite the success of environmentalists like McKibben at persuading the Obama administration to block a pipeline intended to ship this oil to refineries in the US, it’s clear (as it was crystal clear all along to anyone with eyes to see) that the world has every intention of making use of the “crappy liquor.” Again, for people who base their claim to world leadership on their superior understanding of the dynamics of complex systems, greens prove over and over again that they are surprisingly naive and crude in their ability to model and to shape the behavior of the political and economic systems they seek to control. If their understanding of the future of the earth’s climate is anything like as wish-driven, fact-averse and intellectually crude as their approach to international affairs, democratic politics and the energy market, the greens are in trouble indeed. And as I’ve written in the past, the contrast between green claims to understand climate and to be able to manage the largest and most complex set of policy changes ever undertaken, and the evident incompetence of greens at managing small (Solyndra) and large (Kyoto, EU cap and trade, global climate treaty) political projects today has more to do with climate skepticism than greens have yet understood. Many people aren’t rejecting science; they are rejecting green claims of policy competence. In doing so, they are entirely justified by the record. Nevertheless, the future of the environment is not nearly as dim as greens think. Despairing environmentalists like McKibben and Monbiot are as wrong about what the new era of abundance means as green energy analysts were about how much oil the planet had. The problem is the original sin of much environmental thought: Malthusianism. If greens weren’t so addicted to Malthusian horror narratives they would be able to see that the new era of abundance is going to make this a cleaner planet faster than if the new gas and oil had never been found. Let’s be honest. It has long been clear to students of history, and has more recently begun to dawn on many environmentalists, that all that happy-clappy carbon treaty stuff was a pipe dream and that nothing like that is going to happen. A humanity that hasn’t been able to ban the bomb despite the clear and present dangers that nuclear weapons pose isn’t going to ban or even seriously restrict the internal combustion engine and the generator. The political efforts of the green movement to limit greenhouse gasses have had very little effect so far, and it is highly unlikely that they will have more success in the future. The green movement has been more of a group hug than a curve bending exercise, and that is unlikely to change. If the climate curve bends, it will bend the way the population curve did: as the result of lots of small human decisions driven by short term interest calculations rather than as the result of a grand global plan. The shale boom hasn’t turned green success into green failure. It’s prevented green failure from turning into something much worse. Monbiot understands this better than McKibben; there was never any real doubt that we’d keep going to the liquor store. If we hadn’t found ways to use all this oil and gas, we wouldn’t have embraced the economics of less. True, as oil and gas prices rose, there would be more room for wind and solar power, but the real winner of an oil and gas shortage is… coal. To use McKibben’s metaphor, there is a much dirtier liquor store just down the road from the shale emporium, and it’s one we’ve been patronizing for centuries. The US and China have oodles of coal, and rather than walk to work from our cold and dark houses all winter, we’d use it. Furthermore, when and if the oil runs out, the technology exists to get liquid fuel out of coal. It isn’t cheap and it isn’t clean, but it works. The newly bright oil and gas future means that we aren’t entering a new Age of Coal. For this, every green on the planet should give thanks. The second reason why greens should give thanks for shale is that environmentalism is a luxury good. People must survive and they will survive by any means necessary. But they would much rather thrive than merely survive, and if they can arrange matters better, they will. A poor society near the edge of survival will dump the industrial waste in the river without a second thought. It will burn coal and choke in the resulting smog if it has nothing else to burn. Politics in an age of survival is ugly and practical. It has to be. The best leader is the one who can cut out all the fluff and the folderol and keep you alive through the winter. During the Battle of Leningrad, people burned priceless antiques to stay alive for just one more night. An age of energy shortages and high prices translates into an age of radical food and economic insecurity for billions of people. Those billions of hungry, frightened, angry people won’t fold their hands and meditate on the ineffable wonders of Gaia and her mystic web of life as they pass peacefully away. Nor will they vote George Monbiot and Bill McKibben into power. They will butcher every panda in the zoo before they see their children starve, they will torch every forest on earth before they freeze to death, and the cheaper and the meaner their lives are, the less energy or thought they will spare to the perishing world around them.But, thanks to shale and other unconventional energy sources, that isn’t where we are headed. We are heading into a world in which energy is abundant and horizons are open even as humanity’s grasp of science and technology grows more secure. A world where more and more basic human needs are met is a world that has time to think about other goals and the money to spend on them. As China gets richer, the Chinese want cleaner air, cleaner water, purer food — and they are ready and able to pay for them. A Brazil whose economic future is secure can afford to treasure and conserve its rain forests. A Central America where the people are doing all right is more willing and able to preserve its biodiversity. And a world in which people know where their next meal is coming from is a world that can and will take thought for things like the sustainability of the fisheries and the protection of the coral reefs. A world that is more relaxed about the security of its energy sources is going to be able to do more about improving the quality of those sources and about managing the impact of its energy consumption on the global commons. A rich, energy secure world is going to spend more money developing solar power and wind power and other sustainable sources than a poor, hardscrabble one. When human beings think their basic problems are solved, they start looking for more elegant solutions. Once Americans had an industrial and modern economy, we started wanting to clean up the rivers and the air. Once people aren’t worried about getting enough calories every day to survive, they start wanting healthier food more elegantly prepared. A world of abundant shale oil and gas is a world that will start imposing more environmental regulations on shale and gas producers. A prosperous world will set money aside for research and development for new technologies that conserve energy or find it in cleaner surroundings. A prosperous world facing climate change will be able to ameliorate the consequences and take thought for the future in ways that a world overwhelmed by energy insecurity and gripped in a permanent economic crisis of scarcity simply can’t and won’t do. Greens should also be glad that the new energy is where it is. For Monbiot and for many others, Gaia’s decision to put so much oil into the United States and Canada seems like her biggest indiscretion of all. Certainly, a United States of America that has, in the Biblical phrase, renewed its youth like an eagle with a large infusion of fresh petro-wealth is going to be even less eager than formerly to sign onto various pie-in-the-sky green carbon treaties. But think how much worse things would be if the new reserves lay in dictatorial kleptocracies. How willing and able would various Central Asia states have been to regulate extraction and limit the damage? How would Nigeria have handled vast new reserves whose extraction required substantially more invasive methods? Instead, the new sources are concentrated in places where environmentalists have more say in policy making and where, for all the shortcomings and limits, governments are less corruptible, more publicly accountable and in fact more competent to develop and enforce effective energy regulations. This won’t satisfy McKibben and Monbiot (nothing that could actually happen would satisfy either of these gentlemen), but it is a lot better than what we could be facing. Additionally, if there are two countries in the world that should worry carbon-focused greens more than any other, they are the United States and China. The two largest, hungriest economies in the world are also home to enormous coal reserves. But based on what we now know, the US and China are among the biggest beneficiaries of the new cornucopia. Gaia put the oil and the gas where, from a carbon point of view, it will do the most good. In a world of energy shortages and insecurity, both the US and China would have gone flat out for coal. Now, that is much less likely. And there’s one more reason why greens should thank Gaia for shale. Wind and solar aren’t ready for prime time now, but by the time the new sources start to run low, humanity will have mastered many more technologies that can used to provide energy and to conserve it. It’s likely that Age of Shale hasn’t just postponed the return of coal: because of this extra time, there likely will never be another age in which coal is the dominant industrial fuel. It’s virtually certain that the total lifetime carbon footprint of the human race is going to be smaller with the new oil and gas sources than it would have been without them. Neither the world’s energy problems nor its climate issues are going away any time soon. Paradise is not beckoning just a few easy steps away. But the new availability of these energy sources is on balance a positive thing for environmentalists as much as for anyone else. Perhaps, and I know this is a heretical thought, but perhaps Gaia is smarter than the greens.