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Affordable Energy

As food is energy for human life, so energy is food for the life of the economy. Energy lights our homes and offices, heats and cools our dwelling spaces, produces and transports our goods and services, and powers our information networks. Without commercial energy, modern civilization would not exist, as Alex Epstein, president of the Center for Industrial Progress, explains in his recent book *The Moral Case for Fossil Fuels*.

Like food, energy is of greatest benefit to the greatest number when it is plentiful, reliable, and affordable. Affordable energy literally puts superhuman power at the beck and call of ordinary people. Affordable energy is the most basic reason the average person today lives longer and healthier, travels farther and faster in greater comfort and safety, and has greater access to information than the privileged elites of former times.

Carbon fuels—coal, oil, and natural gas—provide 82 percent of both U.S. and global energy, according to the U.S. Energy Information Administration (EIA). They are the world's dominant energy sources because, in most markets, they beat the alternatives in both cost and performance.

Critics, however, claim carbon fuels have hidden costs that make them unsustainable. Yet, technological advances have continually falsified predictions that we will soon run out of fossil fuels by improving our ability to find resources and to extract them at reasonable cost.

In the 1970s and 1980s, expert commentary often depicted air pollution as an ever-worsening problem that could be solved only by replacing carbon fuels with nonemitting alternatives. Technology falsified that narrative as well. Since 1980, U.S. consumption of coal has increased 31.6 percent; oil, 10.6 percent; and natural gas, 32.3 percent—even as emissions of the six most common air pollutants have decreased by 62 percent, according to EIA and U.S. Environmental Protection Agency data. Even without additional regulation, U.S. air quality would keep improving as newer vehicles and capital stock replace older models and equipment.

CLIMATE CHANGE

Today, critics claim unchecked carbon energy use will cause catastrophic climate change. However, the climate models producing scary impact assessments increasingly diverge from reality.

More importantly, carbon fuels make the climate more livable. Affordable energy supports wealth creation and technological progress, which make societies more resilient and protect people from extreme weather. Since the 1920s, global deaths and death rates from extreme weather have decreased by 93 percent and 98 percent, respectively, according to environmental economist Indur Goklany.

Since the Industrial Revolution, fossil fuels have been the chief energy source of a cycle of progress in which economic growth, technological innovation, human capital formation, and freer trade coevolve and mutually reinforce each other. The result has been a phenomenal increase in both the sheer quantity of human life (population) and human welfare as measured by life expectancy and per capita income. Electrification, the automobile, mechanized agriculture, air-conditioning and refrigeration, the Internet, health technologies, and many other innovations made important contributions to the quality of human life. None of those technologies would have been as highly developed or deployed at scale in a world without abundant, affordable energy.

Climate change mitigation policies pose serious risks to U.S. prosperity, competitiveness, and living standards. Carbon dioxide (CO_2) is the inescapable byproduct of carbon energy use. Commercial technologies do not exist for removing CO_2 emissions from vehicles, power plants, and factories. Consequently, mitigation policies would make carbon energy scarcer and more costly—and the more aggressive the policies, the larger the economic impacts.

The humanitarian concerns raised by anti-carbon policies are significant. Even without national controls on CO_2 emissions, household energy burdens increased over the past decade, especially for the poorest households. On average, U.S. households earning less than $50,000 a year spend more on energy than on food, medicine, clothing, insurance, or health care. Energy costs already impose real burdens on low-income households, including reduced expenditures for food, medicine, and education, reduced savings, and late credit card payments.

Keeping U.S. energy affordable is an important economic, moral, and humanitarian objective. Policy makers are physicians of the body politic. Those heeding the time-honored healer's maxim, "First, do no harm," will reject policies to tax and regulate away America's access to affordable energy.

CO_2 and the Clean Air Act

Since the late 1980s, scores of bills have been introduced in Congress to require the U.S. Environmental Protection Agency (EPA) to regulate greenhouse gases (GHGs), principally carbon dioxide from fossil-fuel combustion. None has been enacted to date. Yet in *Massachusetts v. EPA* (2007), the Supreme Court ruled that the 1970 Clean Air Act (CAA), enacted years before Congress's first climate change hearing, gives the U.S. Environmental Protection Agency (EPA) "unambiguous" authority to regulate GHGs. The EPA has interpreted that decision as a license to steamroll over congressional opposition to its climate policies.

Congress should:

- Amend the Clean Air Act to clarify that it never delegated to the EPA the authority to enact climate policies through the Act.

In *Massachusetts v. EPA*, the U.S. Supreme Court ruled that the EPA must regulate greenhouse gas emissions from new motor vehicles under Section 202 of the Clean Air Act, if the agency were to determine that such emissions endanger the public health or welfare. The Court reasoned that GHGs fit the Act's "capacious definition" of an air pollutant, and that including them in the agency's jurisdiction would not lead to "extreme measures."

However, neither the EPA nor the petitioners informed the Court what would happen once the agency established GHG emission standards for new motor vehicles. Under the agen-

cy's longstanding interpretation, regulating any air pollutant under any part of the CAA automatically triggers regulation of "major" stationary sources under the Act's preconstruction and operating permit programs. The Court had unwittingly set the stage for an era of extreme measures.

As a result, tens of thousands of previously unregulated "stationary sources"—such as hospitals, schools, office buildings, big-box stores, restaurants, and large single-family homes—would have to undertake complex analyses to determine their "best available control technology" options for curbing CO_2 emissions. An estimated 6.1 million "sources" would have to fill out CAA compliance forms and pay emission tonnage fees just to operate lawfully. Agency workloads would expand far beyond administrative capabilities, sabotaging environmental enforcement and economic development alike.

Major changes in public policy must be based on clear legislative mandates, or else self-government becomes a sham manipulated by nonelected judges and bureaucrats. Congress should curb the Environmental Protection Agency's overreach.

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EPA Carbon Pollution Standards Rule

The U.S. Environmental Protection Agency's (EPA) carbon pollution standards (CPS) rule would make energy more expensive by effectively banning investment in new coal generation—a policy Congress never approved.

Congress should:

- Overturn the carbon pollution standards rule.

Under the CPS rule, if utilities want to build coal power plants they can, but doing so will bankrupt them.

The rule sets a new source performance standard of 1,100 pounds of carbon dioxide per megawatt hour for new coal power plants. Since even state-of-the-art coal power plants emit 1,800 pounds of CO_2 per megawatt hour, the rule is a de facto ban on investment in new coal generation—a policy Congress has never come close to approving.

The EPA claims new coal plants can meet the standard by installing carbon capture and storage (CCS) technology. However, under Section 111(a) of the Clean Air Act, a performance standard must reflect the "best system of emission reduction" that is "adequately demonstrated," taking "cost" into account. CCS has not been adequately demonstrated to be cost-effective. No commercial, utility-scale CCS power plant is currently operating, and the handful under construction would be unaffordable absent generous subsidies. CCS nearly doubles the cost of new coal power plants, which already cost more than new natural gas combined-cycle (NGCC) units.

A Competitive Enterprise Institute analysis comparing current CCS technology to past technologies for reducing sulfur dioxide emissions from power plants reveals that CCS is even less adequately demonstrated today than dry scrubbers were in 1979, when the EPA and courts deemed the technology not commercially viable.

The EPA claims CCS is commercially viable because coal plants can sell the captured CO_2 to oil companies for use in enhanced oil recovery (EOR). But the agency can identify only 12 states with significant EOR operations (79 FR 1474). Coal power plants not located in relative proximity to oil fields would not have a market for their captured CO_2.

The EPA cites three CCS projects, at varying stages of development, to make the case that the technology is "adequately

demonstrated." However, the 2005 Energy Policy Act prohibits the agency from basing an "adequately demonstrated" determination on CCS projects that received subsidies under the Act. All three of the projects that the EPA cites have received such subsidies.

The utility-scale CCS plant nearest to completion is the Kemper Project in Mississippi. The facility's cost has increased from an initial estimate of $2.2 billion to $6.1 billion—88 percent to 107 percent more costly than advanced pulverized coal plants and 496 percent more costly than advanced NGCC plants, according to the U.S. Energy Information Administration's power plant capital and operating cost estimates.

The CPS rule is unlawful, if proposed in legislation it would be dead on arrival, and it is the gateway rule to the much-greater mischief of the Clean Power Plan. Congress should overturn it.

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Clean Power Plan

The U.S. Environmental Protection Agency's Clean Power Plan (CPP) would substantially increase electricity prices, raise alarming reliability concerns, and undermine federalism. Although potentially the most expensive Clean Air Act regulation ever, it will have no discernible impact on global temperatures or sea-level rise.

Congress should:

- Overturn or defund the EPA's Clean Power Plan.

The Clean Power Plan represents an EPA power grab over state electricity policies through an implausible interpretation of a minor provision in the Clean Air Act for a purpose Congress never intended.

The CPP establishes existing source performance standards (ESPS) for power-sector carbon dioxide emissions for each state. Calibrated in pounds of CO_2 per megawatt hour, the standards translate into mandatory statewide CO_2 reduction targets.

Some states without renewable energy quotas, emission caps, or demand-reduction mandates will have to adopt them; others with such requirements will have to tighten them. Grid operators will have to replace "economic dispatch" with "low-carbon dispatch," giving priority to generating units with low emissions rather than those with low cost. Once approved by the EPA, state compliance plans will be binding through 2030, regardless of how states' policy preferences may change in the interim.

The EPA claims the CPP will cost $7.3 billion to $8.8 billion in 2030. But the Virginia State Corporation Council estimates that Dominion Power (which serves customers in North Carolina, West Virginia, and Ohio, in addition to Virginia) will have to spend $5.5 billion to $6 billion to meet the state's 2020 CO_2

reduction target. If correct, Dominion alone will have to spend two-thirds of the EPA's estimated nationwide compliance cost. NERA Economic Consulting estimates that the CPP will:

1. Cost state power sectors between $41 billion and $73 billion in 2030—560 percent to 820 percent more than the EPA's estimate;
2. Cause double-digit electricity rate hikes in 43 states;
3. Force the premature retirement of 45,000 megawatts of coal generation capacity (equivalent to the New England states' combined electric output); and
4. Have disproportionate impacts on low- and middle-income households, which already struggle with high energy costs.

The expense is all the more exorbitant considering the rule's minuscule climate benefits. Based on EPA climate modeling, the CPP will reduce global warming by less than 0.02 degree Celsius in 2100, and reduce sea-level rise by 1/100 of an inch.

Moreover, through the CPP, the EPA is exceeding its authority to pursue goals Congress never authorized.

The EPA's authority to promulgate ESPS comes from Section 111(d) of the Clean Air Act. However, power plants, which have been regulated under CAA Section 112 since December 2011, are exempt from ESPS regulation, because regulation of a source category under CAA Section 112 preempts regulation under Section 111(d). The CPP establishes ESPS for state *power sectors*. To meet their CPP targets, states must regulate not only the designated facilities in question—fossil-fuel power plants—but also factors affecting demand for such sources, including retail electricity consumption, generation fuel mix, and generation dispatch policy. That regulatory overreach has no basis in the statute, the federal code, or regulatory practice.

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Social Cost of Carbon

The social cost of carbon (SCC), the damage supposedly caused by an incremental ton of carbon dioxide emitted in a given year, is an unknown quantity. By fiddling with speculative model inputs, SCC analysts can make renewable energy look like a bargain at any price and carbon fuels look unaffordable no matter how cheap. Even if modelers made all the right guesses, SCC analysis would still be one-sided and misleading, because it ignores the social costs of carbon mitigation.

Congress should:

- Overturn or defund any rule using social cost of carbon estimates for regulatory justification.
- Defund SCC modeling programs.

The social cost of carbon is an unknown quantity that is not discernible in either economic or meteorological data. SCC estimates are generated by computer programs called integrated assessment models (IAMs), which combine speculative climatology, made-up damage functions, and below-market discount rates to allow SCC analysts to get almost any result they seek. The higher the SCC estimate, the more plausible the claim that the benefits of CO_2-re-

duction policies justify the costs. In 2013, the administration increased its 2010 SCC estimates by almost 60 percent.

However, recent developments in climate science—including validation of the warming pause, the growing divergence between models and observations, and numerous studies indicating that the climate models of the United Nations Intergovernmental Panel on Climate Change are skewed toward greater warming—indicate climate change is better than feared, not worse than predicted. For example, there has been no trend since 1990 in U.S. hurricane-related damages once losses are adjusted for changes in population and wealth, and no trend globally since 1970 in the frequency and strength of land-falling hurricanes.

Agencies use SCC estimates not to develop rules but to promote them. For example, the EPA claims its Clean Power Plan will deliver $31 billion in climate benefits by 2030, even though by the agency's own scientific assumptions, the CPP will avert only 0.02 degree Celsius of warming by 2100, and even less by 2030.

The Office of Management and Budget's Circular A-4 instructs agencies to use discount rates of 7 percent—the average before-tax rate of return to private capital in the U.S. economy—and 3 percent—the average rate of return on long-term government bonds—in regulatory impact analysis. Lower discount rates may be used for intergenerational effects, such as climate change, but that is optional. The 7 percent discount rate, however, is mandatory for all cost-benefit assessments. The administration's SCC technical support documents use discount rates of between 2.5 percent and 5 percent. That lower-than-recommended range increases SCC estimates by increasing the present value of future hypothesized climate damages. It also hides the full opportunity cost associated with capital investment in climate mitigation.

Modelers can make renewable energy look like a bargain at any price, and carbon energy look unaffordable no matter how cheap, by cherry-picking discount rates and speculative assumptions such as how much warming results from a given increase in CO_2 concentration, how warming will affect ice-sheet dynamics, and how adaptive technology will develop.

Two assessment models used by the administration—known as Dynamic Integrated Climate-Economy (DICE) and Policy Analysis of the Greenhouse Effect (PAGE)—omit or severely underestimate the benefits of CO_2 fertilization on food production. A recent analysis using the Food and Agriculture Organization's commodity data and empirical CO_2 fertilization data estimates that rising CO_2 concentrations boosted global crop production by $3.2 trillion during 1961–2011 and will increase output by another $9.8 trillion between now and 2050. Omitting realistic CO_2 fertilization benefits injects a substantial pro-regulatory bias into SCC analysis.

Heritage Foundation analysts David Kreutzer and Kevin Dayaratna ran two of the administration's three IAMs using a 7 percent discount rate. SCC estimates decreased by 80 percent in the DICE model and declined to zero or became negative (social benefits exceeded costs) in another IAM used by the administration, known as the Climate Framework for Uncertainty, Negotiation and Distribution (FUND) model.

Even if all IAM inputs were correct, SCC estimation would still be one-sided and misleading, because it disregards the social costs of carbon mitigation policies.

The social benefits of carbon energy are substantial. For example, as climate economist Indur Goklany explains, capabilities supported by carbon energy—including mechanized agriculture, fertilizers, refrigeration, plastic packaging, and motorized transport of food from surplus to deficit regions—are among the chief reasons deaths and death rates from drought have declined by 99.97 percent and 99.99 percent, respectively, since the 1920s. A meal that sustains a human life has a social value far exceeding the market price of the food.

Since CO_2 cannot yet be decoupled at a reasonable cost from carbon energy, CO_2 reduction policies have social costs, including higher energy costs and reduced access to affordable energy for people in developing countries. Carbon energy supports every technology critical to human flourishing in the modern world. Without it, the Earth would sustain fewer people, and the average person would be poorer, sicker, and shorter lived.

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Carbon Taxes

A carbon tax is a market-rigging policy, not a free-market one. A carbon tax would not be revenue neutral and would not displace greenhouse gas regulations. Even if the tax were revenue neutral, it would make the tax system less efficient, as politics, not the social cost of carbon, which is unknowable, would determine carbon tax rates. Moreover, even the most aggressive feasible carbon tax would have negligible climate impacts, while imposing significant costs on the economy.

Congress should:

- Reject all carbon tax legislation.

A carbon tax seeks to tilt the market against carbon-based fuels. It has the same general functions as renewable energy quotas, fracking bans, or Solyndra loan guarantees: the power to pick energy market winners and losers. According to former Energy Secretary Steven Chu, carbon-pricing schemes "drive investment decisions towards clean energy." Or as President Obama put it, pricing carbon would "finally make renewable energy the profitable kind of energy in America."

Carbon taxes are costly symbolism. A carbon tax phasing out all coal generation by 2038 would reduce employment by 600,000 jobs in 2023, reduce a typical household's annual income by $1,200, and reduce the cumulative gross domestic product by $2.3 trillion, according to a 2013 Heritage Foundation analysis.

A carbon tax would not be revenue neutral. Washington's big spenders have no interest in "tax reform" that does not also "enhance" revenues. Any carbon tax made in Washington would increase current tax burdens, not offset them. The fact that British Columbia enacted a revenue-neutral carbon tax proves nothing. British Columbia's government is running strong annual surpluses. When a government is flush with cash, it is easy to be revenue neutral with new taxes. With Washington running annual deficits of nearly half a trillion

dollars, U.S. politicians are more likely to see a carbon tax as a new cash cow to milk.

Even a revenue-neutral carbon tax would make the tax system less efficient. As Institute for Energy Research economist Robert Murphy points out, the smaller the base on which a tax of a given size is levied, the more it adversely affects employment and distorts investment. The base of a carbon tax—a set of particular commodities or industries—is narrower than the base for retail sales, income, and labor taxes.

A carbon tax would not displace greenhouse gas regulations. Any grand bargain in which carbon taxes are meant to displace regulations is bound to give us carbon taxes *in addition to* greenhouse gas regulations. Cap-and-trade and carbon taxes are both carbon-pricing schemes, which supposedly make them more efficient than command-and-control regulation. However, if climate campaigners were serious about efficiency, the failed Waxman-Markey cap-and-trade bill of 2009 would have repealed existing regulations. Instead, the bill contained hundreds of pages of regulations on appliances, buildings, fuels, power plants, and electric generation fuel mix—in addition to its cap-and-trade scheme.

Politics, not the unknowable social cost of carbon, would determine carbon tax rates. As explained in the preceding section, the social cost of carbon is an unknown quantity that is not discernible in either economic or meteorological data. SCC estimates are generated by computer programs called integrated assessment models, which combine speculative climatology, made-up damage functions, and below-market discount rates, allowing SCC analysts to get almost any result they seek. The higher the SCC estimate, the more plausible the claim that the benefits of CO_2-reduction policies justify the costs. Such a pseudoscientific approach can be used only to rationalize political preferences, not to inform them. In debates over carbon tax rates, revenue-hungry agencies and politicians would patronize SCC modelers whose computers crank out the biggest, scariest numbers.

Even the most aggressive feasible carbon tax would have negligible climate impacts, as Cato Institute scientists Patrick Michaels and Chip Knappenberger show. Using the EPA's climate model emulator—appropriately called MAGICC, for Model for the Assessment of Greenhouse Gas Induced Climate Change—Michaels and Knappenberger calculate that the total U.S. contribution to global warming in the 21st century will be about 0.2 degree Celsius. That means that even an impossibly draconian carbon tax shutting down all U.S. carbon energy consumption tomorrow would have no discernible climate impact for several decades. The climate impact of any politically feasible carbon tax would be even more minuscule.

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CLEAN AIR NAAQS

The Clean Air Act's regulatory regime for ozone pollution abatement is fundamentally broken. Because ozone is a "non-threshold" pollutant, there is no "scientific" standard at which there is zero impact. Rather, it has a continuum of effect. And although differences in health impact along that continuum are slight, the differences in compliance costs are profound. Thus, setting the standard for ozone is a quintessential policy-making determination, for which the U.S. Environmental Protection Agency (EPA) should weigh both the costs and benefits in rendering a decision.

However, thanks to a series of federal court rulings, responsibility for setting ozone standards has been given to an insular group of advisers, the seven-member Clean Air Science Advisory Committee (CASAC). CASAC's recommended ozone standard, which is due to be finalized in 2015, could cost the economy trillions of dollars. Yet, CASAC is in no way accountable to U.S. voters. To fix the Clean Air Act's program for ozone pollution mitigation, Congress must restore policy-making discretion to the EPA and task CASAC with its proper statutory role of advising the EPA on the public health dangers of ozone—and of ozone policy.

Congress should:

- Require CASAC to fulfill its responsibility pursuant to 42 U.S.C. §7409(d)(2)(C)(iv) to "advise the administrator of adverse public health, welfare, social, economic, or energy effects which may result from various strategies for attainment and maintenance of such national ambient air quality standards."
- Amend 42 U.S.C. §7607(d)(3) so that courts of judicial review afford deference to the EPA's reasonable explanation for adopting a national ambient air quality standard that differs from CASAC's advice.

Under the Clean Air Act, the Environmental Protection Agency must establish a national standard for ambient air concentrations of ground-level ozone at a level "requisite to protect public health." That national ozone standard must be reviewed and, if necessary, revised every five years. In 1977, Congress established the Clean Air Science Advisory Committee—a seven-member board nominated annually, primarily from the ranks of epidemiologists and public health officials—and tasked it with advising the EPA on the costs and social effects of its recommended ozone standard.

However, CASAC has never fulfilled its statutory duty to do so. That failure is troubling in light of the fact that ozone is a "non-threshold" pollutant—that is, there is no threshold at which ambient air concentrations of ozone cease to have an effect on human health. Therefore, there is no obvious line at which to draw zero impact. Rather, it is a continuum. And as explained by Susan Dudley, director of George Washington University's Regulatory Studies Center, "Once you recognize that science alone cannot determine definitively what the standard should be, then you are faced with policy decisions, and policy decisions involve tradeoffs."

That policy choice should be made by the EPA, which represents a branch of government that is accountable to voters through presidential elections. However, the D.C. Circuit Court of Appeals, which is the exclusive court of review for national ozone standards, has interpreted the Clean Air Act such that, in practice, the EPA cannot deviate from CASAC's advice on where to set the standard. As such, the EPA is effectively bound by CASAC in establishing an ozone standard.

The D.C. Circuit's empowerment of CASAC is hugely problematic. CASAC's recommended range of standards would place 80 percent to 96 percent of eligible counties in "nonattainment" status, which is a de facto deindustrialization mandate. According to a recent industry study, the ozone rule could impose costs of up to $1 trillion annually, making it the most expensive regulation ever. CASAC, an unelected body of technocrats, has no business rendering decisions of such gravity for the American people.

Experts: Marlo Lewis, William Yeatman, Myron Ebell, Chris Horner

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RENEWABLE FUEL STANDARD

The Renewable Fuel Standard (RFS), which requires refiners to blend and sell ever-increasing quantities of biofuel over a 15-year period (2007–2022), is a textbook study in the law of unintended consequences. It adds billions of dollars to the cost of food, prompts more greenhouse gas emissions than the petroleum consumption it is supposed to displace, contributes agricultural runoff, and imposes a hidden tax on motorists and billions in costs on poultry, hog, beef, and dairy farmers. Moreover, it has done little to reduce American dependence on foreign oil.

Congress should:

- Freeze the Renewable Fuel Standard at 15.1 billion gallons, as proposed by the U.S. Environmental Protection Agency (EPA) in November 2013.
- Develop and pass a plan to phase out the RFS.

By inflating corn and other commodity prices, the Renewable Fuel Standard adds billions of dollars to the cost of food.

The RFS is also bad for the environment. It shrinks species habitat by spurring farmers to shift 23 million acres of grassland, shrubland, and wetlands from food to fuel crops during 2008–2011, according to analysis by the Environmental Working Group. By artificially increasing demand for corn, the RFS contributes significantly to agricultural runoff and the 5,000-square-mile Gulf of Mexico "dead zone," where fertilizer-fueled algae blooms sink, decompose, and deplete oxygen in bottom waters, killing fish, crustaceans, and other marine animals.

The RFS may also be counterproductive as a greenhouse gas mitigation strategy. Shifting agricultural land from food crops to fuel crops releases carbon locked in soils, leading to more greenhouse gas emissions than the petroleum consumption it displaces.

The RFS also imposes a hidden tax on motorists, because ethanol has one-third less energy than an equal volume of gasoline. The RFS increased consumer spending on motor fuel by $14.5 billion (10 cents per gallon) in 2011, according to economist Thomas Elam.

The RFS has done little to reduce American dependence on foreign oil, which has come about largely because of increased fossil-fuel production here at home (and oil imports are a false security threat anyway). Instead, the RFS contributed to global instability, by adding to grain price spikes that triggered food riots in Africa and the Middle East in 2008 and 2011, according to the New England Complex Systems Institute.

Although the RFS does benefit corn farmers, it imposes billions in costs on poultry, hog, beef, and dairy farmers, who use corn as animal feed. The RFS contributed to widespread livestock-sector bankruptcies and job losses during the 2012 drought.

The RFS's 15-year production quota schedule is supposed to ensure regulatory predictability. Instead, the growing mismatch between statutory RFS blending targets and the amount of ethanol the market can actually absorb (a constraint known as the "blend wall") ensures that the EPA determines each year's target on the basis of political calculations and interest-group lobbying.

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