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T-Medicine

#### Interpretation – Marijuana isn’t a Medicine

Mosley 20, Mark. "Medical Marijuana Is a Dangerous Lie." Emergency Medicine News 42.8 (2020): 2-3. (Dr. Mark Mosley is an emergency medicine physician in Wichita, Kansas and is affiliated with Wesley Healthcare Center. He received his medical degree from University of Oklahoma College of Medicine and has been in practice for more than 20 years.)//Elmer

**Marijuana is not a medical drug.** It is a **slang term for** a **plant of the Cannabis family that contains more than 60 different cannabinoid substances and more than 80 biologically active compounds**. Using the term marijuana in place of THC would be like using willow tree in place of acetylsalicylic acid, the active ingredient in aspirin.

#### FDA and CDC definitions prove.

CDC ’18 (CDC; Centers for Disease Control and Prevention; 3-7-2018; “**Is marijuana medicine**?”; CDC; <https://www.cdc.gov/marijuana/faqs/is-marijuana-medicine.html>; Accessed: 9-4-2021; AU)

The marijuana plant has chemicals that may help symptoms for some health problems. More and more states are making it legal to use the plant as medicine for certain conditions. But there isn’t **enough research** to show that the whole plant works to treat or cure these conditions. Also, the U.S. Food and Drug Administration (FDA) **has not recognized** or **approved** the marijuana plant **as medicine**. Because marijuana is often smoked, it can damage your lungs and cardiovascular system (e.g., heart and blood vessels). These and other damaging effects on the brain and body could make marijuana more harmful than helpful as a medicine. Another problem with marijuana as a medicine is that the ingredients aren’t exactly the same from plant to plant. There’s no way to know what kind and how much of a chemical you’re getting.

#### Violation – the resolution calls for reductions on IP protections for medicines, but the aff prevents future patents for cannabis-derived products.

#### Vote neg for limits and ground. Expanding the definition of “medicine” to anything that could be used in a medical setting floods the neg with cases to prep for – everything from new methods of chemo to upgrading stethoscopes becomes topical.

#### At best – they’re extra-T since Cannabis isn’t intrinsically medicinal, it just has medicinal uses so they would reduce Recreational Marijuana patents too which isn’t topical and explodes limits.

Johnson 20 Ian Johnson 1-20-2020 "Cannabis Patents 2000 – 2019: Trends Following Legalization" <https://plantlaw.com/2020/01/20/cannabis-trends-medical-recreational/> (Registered Patent Agent, Plant & Planet Law Firm)//Elmer

These findings correspond to the overall increase in **cannabis-related patents** and demonstrate that the recreational patent sector is growing at an even greater rate than cannabis patents generally. This supports the theory that recreational markets and expansion of legal personal use of cannabis have resulted in an increase in patent activity in the industry. Again, publication totals are not necessarily the most accurate reflection of patent behavior by cannabis businesses. Therefore, it is useful to examine filing and provisional trends for recreational patents. These results are subject to the same 18-month delay problems noted above, and therefore actual and projected values are provided. Using actual filing data for 2017, there has been a 181% increase in filing activity since 2012. Using projected filing data for 2019, there has been a 257% increase in recreational filing activity since 2012. Using actual priority claims for 2017, there has been a 196% increase in provisional filing activity since 2012. Using projected priority claims for 2019, there has been a 289% increase in recreational provisional filing activity since 2012. The following charts demonstrate recreational filing trends from 2012 to 2019. Patents **that could be classified as recreational** **made up approximately 53% of all filings** between 2000 and 2011. However, **following legalization** the percent of patents and applications considered recreational has **increased to** approximately **77% of filings in 2018**. The chart below demonstrates the growth of the recreational sector’s share of cannabis patent activity.

Spirit >

### 1NC - OFF

Legalization CP

#### CP Text: The member nations of the World Trade Organization should legalize marijuana.

**Federal criminalization of marijuana destroys cross-agency collaboration at all levels of government, weakens the rule of law, and wrecks effective federalist governance.**

**Malone 18** [Matthew A. Malone, Professor of Law, Lehigh University, Winter, 2018, “ARTICLE: FEDERAL MARIJUANA POLICY: HOMAGE TO FEDERALISM IN FORM; POTEMKIN FEDERALISM IN SUBSTANCE,” 63 Wayne L. Rev. 215, 245-266, lexis]

The Controlled Substances Act, in form, pays fealty to federalism but, in substance, it does violence to its underlying principles in two respects. First, despite the fact that the Controlled Substances Act allowed states the space in which to pursue their own policy preferences, its treatment of marijuana as a Schedule I substance imposes difficult practical obstacles for alternate state treatment of the substance Whatever. policy choices are made at the state level, **marijuana is an illegal substance under federal law**--a fact whose consequences cause the Controlled Substances Act to occupy the field in many practical respects. The Controlled Substances Act pays lip service to state authority. Second, **tolerance for violation of federal law**, whether by state or federal authorities, **is a sign of open disrespect for federal law.** Cultural norms have a significant influence on the level of voluntary compliance with the law. The existence of effective deterrents to non-compliance and the reputational harm attendant to such non-compliance are **critical**--and often reinforcing--**components of an effective legal scheme that is predicated**, in large part, **on voluntary compliance**. Reputational harm [\*262] is, in turn, dependent upon cultural norms and transparency. Because the U.S. tax system depends, to a great extent, on voluntary compliance by taxpayers, it offers an example of the effects of a cultural norm of compliance predicated, for the most part, on deterrence. Levels of voluntary tax compliance are high in the United States and one would expect that this fact has contributed to a strong cultural norm of compliance, thereby heightening the reputational harm of non-compliance. In fact, anecdotal evidence suggests that, absent deterrence, levels of voluntary compliance would be quite low. For the most part, the third-party reporting requirements with respect to wages, interest, dividends, and many other forms of income ensures an extremely high detection rate for noncompliance. Certain segments of the taxpayer population whose noncompliance is not easily detected are notorious for noncompliance--small businesses, for example. Such taxpayers have non-compliance rates of approximately fifty percent. [\*263] Historically, income generated from foreign financial accounts has not been subject to third party reporting, and non-reporting of such income was endemic. The I.R.S. estimated a gross tax gap of approximately $ 450 billion in 2006, the vast majority of which was attributable to underreported income. Income not subject to third party reporting was misreported at a fifty-six percent rate in that year. The I.R.S. issued an update to its 2006 report that estimated the annual tax gap at approximately $ 458 billion during the years 2008 to 2010 and a sixty-three percent rate of misreporting by taxpayers not subject to third party income reporting. The prevalence of strong cultural norm of tax compliance faces several obstacles. The fact that tax information is confidential inhibits the effects of reputational harm. High profile criminal prosecution or media attention to the tactics of publicly-traded corporations does focus attention on reputational harm, but such cases are rare and, in any event, may not cause reputational harm. In the face of consumer protests over its tax tactics in the United Kingdom, Starbucks recently decided to move its European headquarters there. However, Starbucks' response [\*264] was aberrational. Apple, in contrast, perceived little reputational harm stemming from its aggressive tax strategies. The **current legal state of affairs with respect to marijuana serves to diminish respect for federal law in general**. The fact that many states have made policy choices inapposite to long-standing federal policy is neither unusual nor troublesome. What is problematic is the federal government's response to states' disparate policies. Throughout the nation's history, state responses to federal law with which they disagree often have been confrontational. State attempts to nullify federal law can be traced as far back as the late eighteenth century and over the course of our history have implicated, inter alia, the Alien and Sedition Acts of 1798, taxation of the bank of the United States, embargoes during the war of 1812, tariffs during the early part of the nineteenth century, and the Fugitive Slave Act. In modern times, states have attempted to thwart school desegregation and federal gun control legislation. However, in such cases the federal government vigorously defended its prerogatives, either in court or with threats of force. **It is arguable that state law legalization of marijuana is tantamount to nullification**. Although state legalization does not purport to invalidate federal law, such laws do explicitly sanction actions that the federal government does not. In and of itself, this is not troubling and, in fact, is an example of federalism at work. The federal government's response, however, is troubling. **Instead of defending federal law**--**or quietly acquiescing to state policy**--the federal government has chosen to openly disregard its own law as evidenced by the Department of Justice memorandums to the U.S. Attorneys. Moreover, Congress itself has passed legislation that bars [\*265] the Department of Justice from using funds to enforce the Controlled Substances Act against activities that are sanctioned under state law. The notion that a federal law enforcement authority categorically announces it will not enforce a law under particular circumstances and Congress defunding any such efforts, is disquieting--particularly in this instance. The exercise of prosecutorial discretion is commonplace and may be motivated by a number of factors such as resource constraints, laws whose effects in a particular case are unintended or the result of poor legislative language, or societal shifts that command public support for such discretion. The latter reason provides all the more justification in the face of a dysfunctional legislature that is incapable of reacting in a timely fashion to societal changes. It appears that federal enforcement policy with respect to marijuana is a reaction to significant changes in social norms with respect to marijuana usage, as reflected by the number of states that have legalized marijuana to some extent. Non-enforcement of laws under such circumstances may be desirable if the societal benefits exceed the cost of lack of action. There is a cost of non-enforcement. Such actions cannot help but erode citizens' respect for federal law. In effect, the federal government itself is signaling that federal law is not necessarily binding. However, the benefits derived by current federal policy towards marijuana are minimal because it is, at best, a half-measure. To be sure, state actors can take comfort in a reduced fear of criminal prosecution. This comfort, however, does not extend to the assurance that contracts will be enforceable, to the ability to bank like other businesses, to the imposition of the same tax burden as taxpayers in general, or to the availability of bankruptcy protection. The collateral effects of the Controlled Substances Act diminish, if not overwhelm, the discretion exercised by the Department of Justice and the defunding of any efforts by the department not in keeping with such discretion. [\*266] So what has federal policy accomplished? It has disregarded federal law, yet it has maintained a host of infirmities on state sanctioned marijuana businesses. Moreover, federal policy is inviting state judges, sometimes at the urging of state legislatures, **to ignore federal law in their determination of public** policy. Federal officials should exercise great caution in this respect because **if a state judge can ignore federal law due to the actions of federal officials in the marijuana context, they can do so in other contexts.** Moreover, I would imagine that **once state judges have crossed this Rubicon it becomes more likely that they do so again**. V. CONCLUSION Current federal policy regarding marijuana ostensibly pays homage to state policy preferences. However, the **continued status of marijuana as a Schedule I narcotic** significantly **impairs the ability of state policy preferences to come to full fruition**. If, as I and many believe, state preferences with respect to marijuana should be respected, then **the appropriate response is to amend federal law**, not ignore it, **and defund federal law enforcement efforts**. The refusal to take legislative action and, instead, to resort to politically more expedient means that openly diminish the force of federal law can have dangerous, and broader, implications. The tax system evidences the difficulties caused by the failure to entrench a norm of compliance not driven by deterrence, and policy makers should be careful in believing that the tax system is somehow sui generis. The controversy over the enforcement of federal immigration laws and the open defiance of such laws by some state and local authorities should give Congress and the Executive branch pause before taking any actions that encourage the belief that the law, in the right circumstances, is appropriately ignored. Sometimes Congress gets lucky and avoids having to make politically-charged choices. The Supreme Court bailed out Congress on the matter of same-sex marriage. It is unlikely that the Court will do the same here.

#### Plan spills over to all federalism disputes

Rauch 13 [Jonathan, guest scholar in Governance Studies at Brookings, “”Washington Versus Washington (and Colorado): Why the States Should Lead on Marijuana Policy”, <http://www.brookings.edu/~/media/Research/Files/Papers/2013/3/26%20marijuana%20legalization%20localism%20rauch/Washington%20Versus%20Washington%20and%20Colorado_Rauch_v17.pdf>]

In short, there is no alternative to the exercise of political judgment. Mature people will have to make conscious choices about how to manage social change and conflict with a minimum of unnecessary pain and disruption. The stakes transcend drug policy proper: marijuana legalization, far from standing alone, is an installment in a series. In the past several years, state-federal conflict has become a running theme of the national debate, on multiple hot-button issues and in multiple permutations: • On immigration, the federal government demanded that the states follow federal policy. Arizona claimed a right to independently enforce federal law, even if its enforcement priorities differed from those of the federal government. It also asserted a right to supplement federal policies with its own more stringent ones. The federal government objected, and the Supreme Court delivered a mixed ruling which mostly favored the federal government. • On Obamacare (the 2010 Affordable Care Act), states demanded the right not to follow federal policy. They challenged the law’s expansion of Medicaid and its mandate to buy health insurance. The Supreme Court again delivered a mixed ruling, this time leaning toward the states. • On gay marriage, states demanded that the federal government follow state policy. In suing to overturn the U.S. Defense of Marriage Act, they claimed that Washington, D.C., had to follow states’ definitions of marriage rather than establish a separate definition of its own. The Supreme Court, at this writing, has yet to rule. Unlike the cases of immigration and Obamacare and the Defense of Marriage Act, marijuana involves not merely friction between state and federal policy but something closer to outright defiance. Even in a context of growing agitation in federal-state relations, this was putting a cat among the pigeons. Avoiding conflict or even chaos is not going to be easy, and the outcome will affect not only drug policy but the way in which the country handles other federal-state conflicts sure to emerge.

#### State leadership on climate is crucial to emissions reductions --- preventing federal antagonism against the states is crucial for cooperative federalism to succeed.

Thomson 11 [Vivian E., Associate Professor in the Departments of Politics and Environmental Sciences at the University of Virginia; and Vicki Arroyo, Executive Director of Georgetown's Climate Center at Georgetown Law, where she is a Visiting Professor, 2011, “ARTICLE: UPSIDE-DOWN COOPERATIVE FEDERALISM: CLIMATE CHANGE POLICYMAKING AND THE STATES,” Virginia Environmental Law Journal, 29 Va. Envtl. L.J. 1]

When it comes to fixing the broken politics of global warming, all eyes tend to focus on the global stage and on national policies. After all, climate change is a global phenomenon and emissions in one part of the world contribute to warming everywhere. But in the United States, sub-national governments are responsible for most of the progress in the climate change arena, despite the lack of an obvious rationale for them to reduce emissions whose benefits will spread well beyond their borders. Thirty-five states have stepped in to fill the void left by federal inaction, adopting plans to curb emissions even though the benefits of those reductions will be shared widely. These state-level actions are important for a variety of reasons. First, they bring real and meaningful reductions in greenhouse gas emissions. Perhaps more significantly, they have several key implications for national climate policymaking. These actions point to a rationale for national action and to policy solutions that can attract political support. Further, in the United States, state lawmakers and administrators implement and enforce national air pollution control programs. Thus, state-federal cooperation is crucial for successful program implementation. Finally, the Clean Air Act amendments have passed only when lawmakers accommodated state and regional economic and political considerations. Understanding why states have or have not acted and illuminating their policy approaches can inform the federal policymaking process. The very fact of state leadership in the climate change arena also means that the customary mode of cooperative federalism will not work. In air pollution control, the "customary" mode is a center-dominant model in which the national government establishes an overall framework that the states implement. Climate change policymaking demands a new, "upside-down" cooperative federalism model.

#### X/app 1AC warming

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Debt Ceiling DA

#### Debt ceiling bill’s going to pass now, but business interests are key to force GOP to cave --- debt ceiling is key to prevent drastic economic collapse, aid to Americans, and further legislation

Barron-Lopez and Cadelago 9-9 [Lauara Barron-Lopez and Christopher Cadelago are White House Correspondents for Politico. “Biden wants to force Republicans to vote on the debt ceiling, sensing they’ll cave.” September 9, 2021. https://www.politico.com/news/2021/09/09/biden-mcconnell-debt-limit-threats-510922]

President Joe Biden is treating the latest Republican threats over the debt limit like a bluff. And the entire party, from congressional Democratic leadership to the top brass at the Treasury Department, is calling them on it. Multiple Democratic sources on the Hill and with knowledge of the White House’s thinking said the administration wants to include a suspension of the debt limit — a legal cap on how much the U.S. can borrow — in a continuing resolution to fund the government. Such a bill, which Congress is expected to consider as early as this month, would require 60 votes to pass in the Senate, meaning at least 10 Republicans would need to vote to advance the measure. To challenge those Republicans, Biden is also calling on Congress to include funding for hurricane relief in the bill, and Democratic leadership has continued to shoot down questions about possible alternative legislative vehicles in recent conversations with members and close allies. Including a debt limit increase in Democrats’ pending party-line reconciliation package, for example, is one option. But the White House and Democratic leaders are not entertaining it at present. “They're right at the moment to say, 'We're working on Plan A,'” said a lobbyist with knowledge of the party’s strategy. “The minute you start to signal that that doesn't work then you're signaling weakness.” The posture from the president on down is setting up a game of chicken with incredibly high stakes — if a vote to suspend or increase the debt limit fails, the U.S. economy will likely crater. Treasury officials have said lawmakers will have until an unspecified date next month before the department runs out of ways to prevent a default. The debt limit is the foundation of the “full faith and credit” of the country’s currency and bonds. If it isn’t raised or suspended, the U.S. defaults on its bond investors, its credit rating could tank and, in turn, the government could be forced to scale back on Medicare benefits, Social Security checks and other programs. The belief in the White House is that a mix of pressure — from business leaders expressing urgency to fears of a full blown financial crisis — will be most acute on Republicans as the deadline nears. After voting for years to suspend or increase the debt limit with Democrats — a routine step required by law — GOP lawmakers in recent history have used the threat of default to score political points when a Democratic president is in charge. Learning from his former boss, President Barack Obama — who vowed not to negotiate over the debt ceiling after doing it once — Biden is essentially daring Republicans to vote down a debt limit suspension or increase. Since Republicans led by Senate Minority Leader Mitch McConnell announced publicly that his party members wouldn’t support an increase in the debt limit, the Biden administration has not had any additional talks with him on the issue. McConnell’s office pointed to the senator’s past comments on the debt ceiling but did not address whether the two sides had talked. A White House official said the administration is largely deferring to congressional leaders on the procedural aspects of how to pursue a debt limit increase or suspension. Whether Democrats are pursuing a long- or short-term increase remains unclear. In public and private conversations and briefings with Hill aides, the White House has two main positions: Don’t negotiate with Republicans over what should be a routine vote and clearly message that the debt limit addresses past, not future, spending, seeking to avoid confusion and rebuff GOP attacks over a complex topic. “The debt limit is a function of bills that Congress has already passed, already wrapped up,” said Brian Deese, director of the White House National Economic Council. “Even if Congress took no future action ever, did nothing else in the future, Congress would have to raise or suspend the debt limit because it’s a reflection of actions already taken.” The showdown comes as Biden faces a grueling month that will determine the fate of his signature economic items: the bipartisan infrastructure bill and social spending package. On top of that, government funding runs out Sept. 30, the coronavirus pandemic continues to rage and parts of the country are struggling to rebuild after devastating hurricanes and wildfires. “With everything from Covid to Afghanistan to the weather incidents, the idea that we would self inflict another blow to our country right now and even putting in potential jeopardy the full faith and credit of the United States would be crazy,” said Sen. Mark Warner (D-Va.). Warner said it’s imperative that Democrats clearly articulate why a default is so cataclysmic and that Republicans are also responsible for the debt limit. “Do you really want to vote for shutting down the government, not giving aid to people who are the third of Americans who've had weather affect [them] and mess with the full faith and credit of the United States all in one vote?” Warner said of Republicans. “I hope not.” Warner added that a decade ago, there was near unanimity about the dangerous consequences of not raising the debt limit. “But that was before there was an age of the level of misinformation and disinformation,” he said. “This was not a tool that was used against President Trump so on a fairness argument, we’re making the case. Whether that wins the day at a time when things are so unusual, time will tell.” To stave off a crisis, the administration is also having conversations with business leaders and community bankers and expects them to apply pressure to Republicans with warnings that a default would be catastrophic for the economy, the White House official said. Others who have spent years working on the issue said the fiscal cliff standoff between Obama and Republicans in 2011 — and the resulting lessons both parties have taken since — is informing Biden’s strategy as president. Seth Hanlon, a former special assistant to Obama at the National Economic Council, said the lesson from that episode is that the debt limit is plainly non-negotiable. Republicans took away a different lesson altogether. At the time, they refused to vote to raise the debt limit unless they got corresponding budget cuts. Obama negotiated with congressional GOP leaders on a deal and, after talks scuttled, Biden himself picked up the baton and hammered out an agreement with McConnell. McConnell later said he came away believing that the debt limit, which underlies the financial well-being of the country, was “a hostage that's worth ransoming." That standoff between Democrats and Republicans resulted in the nation’s credit rating being downgraded for the first time in history, something Treasury officials have pointed to in recent days as evidence that even negotiations over the debt limit have damaging consequences. “There were a number of times after 2011 where there was a lot of Republican hue and cry over the debt limit when Obama was president, but ultimately, Mitch McConnell found the cover for himself and his members and joined in raising it,” said Hanlon, now a senior fellow at the Center for American Progress. So far, McConnell has put the onus squarely on Biden and Democrats to raise the debt limit, saying last month that “they have the House, the Senate and the presidency. It’s their obligation to govern … and the essence of governing is to raise the debt ceiling to cover the debt.” In recent remarks on the subject, McConnell stressed that “the debt ceiling needs to be raised,” but said the emphasis is “who should do it. And under these uniquely unprecedented circumstances,” he added, “it’s their obligation to do it.” But Hanlon said he’s confident that pressure from Republican allies in the conservative ranks of big business will ultimately force them to capitulate. “They’re attuned to financial markets and they know the disastrous consequences that will result,” he said of the GOP brinkmanship on Capitol Hill. “As extreme as the Republican Party has become, I don't think McConnell is ultimately willing to push the U.S. over the cliff.”

#### Big Pharma backlashes --- deep money ties to GOP in Congress means they pull the strings

Hutteman 20 [Emmarie Huetteman, Correspondent, came to KHN from The New York Times, where she covered Congress with a focus on the House of Representatives and, most recently, the investigations into Russian meddling in the 2016 election. “Senators who led pharma-friendly patent reform also prime targets for pharma friendly cash.” Mar. 24, 2020. https://khn.org/news/senators-who-led-pharma-friendly-patent-reform-also-prime-targets-for-pharma-cash/]

As the new gatekeeper for laws and oversight of the nation’s patent system, the North Carolina Republican signaled he was determined to make it easier for American businesses to benefit from it — a welcome message to the drugmakers who already leverage patents to block competitors and keep prices high. Less than three weeks after introducing a bill that would make it harder for generic drugmakers to compete with patent-holding drugmakers, Tillis opened the subcommittee’s first meeting on Feb. 26, 2019, with his own vow. “From the United States Patent and Trademark Office to the State Department’s Office of Intellectual Property Enforcement, no department or bureau is too big or too small for this subcommittee to take interest,” he said. “And we will.” In the months that followed, tens of thousands of dollars flowed from pharmaceutical companies toward his campaign, as well as to the campaigns of other subcommittee members — including some who promised to stop drugmakers from playing money-making games with the patent system, like Sen. John Cornyn (R-Texas). Tillis received more than $156,000 from political action committees tied to drug manufacturers in 2019, more than any other member of Congress, a new analysis of [KHN’s Pharma Cash to Congress database](https://khn.org/news/campaign/) shows. Sen. Chris Coons (D-Del.), the top Democrat on the subcommittee who worked side by side with Tillis, received more than $124,000 in drugmaker contributions last year, making him the No. 3 recipient in Congress. No. 2 was Sen. Mitch McConnell (R-Ky.), who took in about $139,000. As the Senate majority leader, he controls what legislation gets voted on by the Senate. Neither Tillis nor Coons sits on the Senate committees that introduced legislation last year to lower drug prices through methods like capping price increases to the rate of inflation. Of the four senators who drafted those bills, none received more than $76,000 from drug manufacturers in 2019. Tillis and Coons spent much of last year working on significant legislation that would expand the range of items eligible to be patented — a change that some experts say would make it easier for companies developing medical tests and treatments to own things that aren’t traditionally inventions, like genetic code. They have not yet officially introduced a bill. As obscure as patents might seem in an era of public outrage over drug prices, the fact that drugmakers gave most to the lawmakers working to change the patent system belies how important securing the exclusive right to market a drug, and keep competitors at bay, is to their bottom line. “Pharma will fight to the death to preserve patent rights,” said Robin Feldman, a professor at the UC Hastings College of the Law in San Francisco who is an expert in intellectual property rights and drug pricing. “Strong patent rights are central to the games drug companies play to extend their monopolies and keep prices high.” Campaign contributions, closely tracked by the Federal Election Commission, are among the few windows into how much money flows from the political groups of drugmakers and other companies to the lawmakers and their campaigns. Private companies generally give money to members of Congress to encourage them to listen to the companies, typically through lobbyists, whose activities are difficult to track. They may also communicate through [so-called dark money groups](https://www.opensecrets.org/darkmoney/dark-money-basics.php), which are not required to report who gives them money. Over the past 10 years, the pharmaceutical industry [has spent about $233 million per year on lobbying](https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2762509), according to a new study published in JAMA Internal Medicine. That is more than any other industry, including the oil and gas industry. Why Patents Matter Developing and testing a new drug, and gaining approval from the Food and Drug Administration, can take years and cost hundreds of millions of dollars. Drugmakers are generally granted a six- or seven-year exclusivity period to recoup their investments. But drugmakers have found ways to extend that period of exclusivity, sometimes accumulating hundreds of patents on the same drug and blocking competition for decades. One method is to patent many inventions beyond a drug’s active ingredient, such as patenting the injection device that administers the drug. Keeping that arrangement intact, or expanding what can be patented, is where lawmakers come in. Lawmakers Dig In Tillis’ home state of North Carolina is also home to three major research universities and, not coincidentally, multiple drugmakers’ headquarters, factories and other facilities. From his swearing-in in 2015 to the end of 2018, Tillis received about $160,000 from drugmakers based there or beyond. He almost matched that four-year total in 2019 alone, in the midst of a difficult reelection campaign to be decided this fall. He has [raised nearly $10 million for his campaign](http://www.opensecrets.org/members-of-congress/summary?cid=N00035492), with lobbyists among his biggest contributors, according to OpenSecrets. Daniel Keylin, a spokesperson for Tillis, said Tillis and Coons, the subcommittee’s top Democrat, are working to overhaul the country’s “antiquated intellectual property laws.” Keylin said the bipartisan effort protects the development and access to affordable, lifesaving medication for patients,” adding: “No contribution has any impact on how [Tillis] votes or legislates.” Tillis signaled his openness to the drug industry early on. The day before being named chairman, he reintroduced a bill that would limit the options generic drugmakers have to challenge allegedly invalid patents, effectively helping brand-name drugmakers protect their monopolies. Former Sen. Orrin Hatch (R-Utah), whose warm relationship with the drug industry [was well-known](https://www.statnews.com/2018/01/02/senator-hatch-pharma-retirement/), had introduced the legislation, the Hatch-Waxman Integrity Act, just days before his retirement in 2018. At his subcommittee’s first hearing, Tillis said the members would rely on testimony from private businesses to guide them. He promised to hold hearings on patent eligibility standards and “reforms to the Patent Trial and Appeal Board.” In practice, the Hatch-Waxman Integrity Act would require generics makers challenging another drugmaker’s patent to either take their claim to the Patent Trial and Appeal Board, which acts as a sort of cheaper, faster quality check to catch bad patents, or file a lawsuit. [A study released last year](https://www.ncbi.nlm.nih.gov/pubmed/30141133) found that, since Congress created the Patent Trial and Appeal Board in 2011, it has narrowed or overturned about 51% of the drugmaker patents that generics makers have challenged. Feldman said the drug industry “went berserk” over the number of patents the board changed and has been eager to limit use of the board as much as possible. Patent reviewers are often stretched thin and sometimes make mistakes, said Aaron Kesselheim, a Harvard Medical School professor who is an expert in intellectual property rights and drug development. Limiting the ways to challenge patents, as Tillis’ bill would, does not strengthen the patent system, he said. “You want overlapping oversight for a system that is as important and fundamental as this system is,” he said. As promised, Tillis and Coons also spent much of the year working on so-called Section 101 reform regarding what is eligible to be patented — “a very major change” that “would overturn more than a century of Supreme Court law,” Feldman said. Sean Coit, Coons’ spokesperson, said lowering drug prices is one of the senator’s top priorities and pointed to [Coon’s support for legislation the pharmaceutical industry opposes](https://www.coons.senate.gov/news/press-releases/sen-coons-cosponsors-legislation-to-bring-down-prescription-drug-costs). “One of the reasons Senator Coons is leading efforts in Congress to fix our broken patent system is so that life-saving medicines can actually be developed and produced at affordable prices for every American,” Coit wrote in an email, adding that “his work on Section 101 reform has brought together advocates from across the spectrum, including academics and health experts.” In August, when much of Capitol Hill had emptied for summer recess, Tillis and Coons [held closed-door meetings to preview their legislation to stakeholders](https://www.tillis.senate.gov/2019/8/tillis-coons-to-hold-new-huddles-on-patent-eligibility-proposal), including the Pharmaceutical Research and Manufacturers of America, or PhRMA, the brand-name drug industry’s lobbying group. “We regularly engage with members of Congress in both parties to advance practical policy solutions that will lower medicine costs for patients,” said Holly Campbell, a PhRMA spokesperson. Neither proposal has received a public hearing. In the 30 days before Tillis and Coons were named leaders of the revived subcommittee, drug manufacturers gave them $21,000 from their political action committees. In the 30 days following that first hearing, Tillis and Coons received $60,000. Among their donors were PhRMA; the Biotechnology Innovation Organization, the biotech lobbying group; and five of the seven drugmakers whose executives — as Tillis laid out a pharma-friendly agenda for his new subcommittee — were getting chewed out by senators in a different hearing room over patent abuse. Cornyn Goes After Patent Abuse Richard Gonzalez, chief executive of AbbVie Inc., the company known for its top-selling drug, Humira, had spent the morning sitting stone-faced before the Senate Finance Committee as, one after another, senators excoriated him and six other executives of brand-name drug manufacturers over how they price their products. Cornyn [brought up AbbVie’s more than 130 patents on Humira](https://www.c-span.org/video/?c4782349/user-clip-sen-john-cornyn-calls-senate-judiciary-committee-referral). Hadn’t the company blocked its competition? Cornyn asked Gonzalez, who carefully explained how AbbVie’s lawsuit against a generics competitor and subsequent licensing deal was not what he would describe as anti-competitive behavior. “I realize it may not be popular,” Gonzalez said. “But I think it is a reasonable balance.” A minute later, Cornyn turned to Sen. Chuck Grassley (R-Iowa), who, like Cornyn, was also a member of the revived intellectual property subcommittee. This is worth looking into with “our Judiciary Committee authorities as well,” Cornyn said, effectively threatening legislation on patent abuse. The next day, Mylan, one of the largest producers of generic drugs, gave Cornyn $5,000, FEC records show. The company had not donated to Cornyn in years. By midsummer, every drug company that sent an executive to that hearing had given money to Cornyn, including AbbVie. Cornyn, who faces perhaps the most difficult reelection fight of his career this fall, ranks No. 6 among members of Congress in drugmaker PAC contributions last year, KHN’s analysis shows. He received about $104,000. Cornyn has received about $708,500 from drugmakers since 2007, KHN’s database shows. According to OpenSecrets, he has [raised more than $17 million for this year’s reelection campaign](https://www.opensecrets.org/members-of-congress/summary?cid=N00024852). Cornyn’s office declined to comment. On May 9, Cornyn and Sen. Richard Blumenthal (D-Conn.) introduced the Affordable Prescriptions for Patients Act, which proposed to define two tactics used by drug companies to make it easier for the Federal Trade Commission to prosecute them: “product-hopping,” when drugmakers withdraw older versions of their drugs from the market to push patients toward newer, more expensive ones, and “patent-thicketing,” when drugmakers amass a series of patents to drag out their exclusivity and slow rival generics makers, who must challenge those patents to enter the market once the initial exclusivity ends. PhRMA opposed the bill. The next day, it gave Cornyn $1,000. Cornyn and Blumenthal’s bill would have been “very tough on the techniques that pharmaceutical companies use to extend patent protections and to keep prices high,” Feldman said. “The pharmaceutical industry lobbied tooth and nail against it,” she said. “And when the bill finally came out of committee, the strongest provisions — the patent-thicketing provisions — had been stripped.” In the months after the bill cleared committee and waited to be taken up by the Senate, Cornyn blamed Senate Democrats for blocking the bill while trying to secure votes on legislation with more direct controls on drug prices. The Senate has not voted on the bill.

#### Weed legislation crowds out the agenda

Jaeger, 19 [Kyle, Marijuana Moment's Los Angeles-based associate editor, 4-4-19, “Lawmakers Roll Out ‘Landmark’ Bill To Protect Legal Marijuana States From Federal Interference”, <https://www.marijuanamoment.net/lawmakers-roll-out-landmark-bill-to-protect-legal-marijuana-states-from-federal-interference/>, BP]

The legislation would amend the Controlled Substances Act to protect people complying with state legal cannabis laws from federal intervention, and the sponsors are hoping that the bipartisan and bicameral nature of the bill will advance it through the 116th Congress. President Trump voiced support for a previous version of the legislation last year. “I’ve been working on this for four decades. I could not be more excited,” Blumenauer told Marijuana Moment in a phone interview. While other legislation under consideration such as bills to secure banking access for cannabis businesses or study the benefits of marijuana for veterans are “incremental steps that are going to make a huge difference,” the STATES Act is “a landmark,” he said. The congressman said it will take some time before the bill gets a full House vote, however. Rep. Jim McGovern (D-MA) recently suggested that the legislation would advance within “weeks,” but Blumenauer said it will “be a battle to get floor time” and he stressed the importance of ensuring that legislators get the chance to voice their concerns and get the answers they need before putting it before the full chamber. “We want to raise the comfort level that people have. We want to do it right,” he said. “There’s no reason that we have to make people feel like they’re crowded or rushed.”

**Economic crisis escalates to nuke war**

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The next economic crisis is closer than you think. But what you should really worry about is what comes after: in the **current social, political, and technological landscape**, a prolonged economic crisis, combined with rising income inequality, could well **escalate** into a **major global military conflict**. The 20**08**-09 global financial crisis **almost** bankrupted governments and caused systemic collapse. Policymakers managed to pull the global economy back from the brink, using massive monetary stimulus, including quantitative easing and near-zero (or even negative) interest rates. But monetary stimulus is like an adrenaline shot to jump-start an arrested heart; it can revive the patient, but it does nothing to cure the disease. Treating a sick economy requires structural reforms, which can cover everything from financial and labor markets to tax systems, fertility patterns, and education policies. Policymakers have utterly failed to pursue such reforms, despite promising to do so. Instead, they have remained preoccupied with politics. From Italy to Germany, forming and sustaining governments now seems to take more time than actual governing. And Greece, for example, has relied on money from international creditors to keep its head (barely) above water, rather than genuinely reforming its pension system or improving its business environment. The lack of structural reform has meant that the unprecedented excess liquidity that central banks injected into their economies was not allocated to its most efficient uses. Instead, it raised global asset prices to levels even higher than those prevailing before 2008. In the United States, housing prices are now 8% higher than they were at the peak of the property bubble in 2006, according to the property website Zillow. The price-to-earnings (CAPE) ratio, which measures whether stock-market prices are within a reasonable range, is now higher than it was both in 2008 and at the start of the Great Depression in 1929. As monetary tightening reveals the vulnerabilities in the real economy, the collapse of asset-price bubbles will trigger another economic crisis – one that could be even more severe than the last, because we have built up a tolerance to our strongest macroeconomic medications. A decade of regular adrenaline shots, in the form of ultra-low interest rates and unconventional monetary policies, has severely depleted their power to stabilize and stimulate the economy. If history is any guide, the consequences of this mistake could extend **far beyond** the economy. According to Harvard’s Benjamin Friedman, prolonged periods of economic distress have been characterized also by public antipathy toward minority groups or foreign countries – attitudes that can help to fuel **unrest**, **terrorism**, or even **war**. For example, during the Great Depression, US President Herbert Hoover signed the 1930 **Smoot-Hawley** Tariff Act, intended to protect American workers and farmers from foreign competition. In the subsequent five years, global trade shrank by two-thirds. Within a decade, **World War II** had begun. To be sure, WWII, like World War I, was caused by a multitude of factors; there is no standard path to war. But there is reason to believe that high levels of inequality can play a significant role in stoking conflict. According to research by the economist Thomas Piketty, a spike in income inequality is often followed by a great crisis. Income inequality then declines for a while, before rising again, until a new peak – and a new disaster. Though causality has yet to be proven, given the limited number of data points, this correlation should not be taken lightly, especially with wealth and income inequality at historically high levels. This is **all the more worrying** in view of the **numerous other factors** stoking social unrest and diplomatic tension, including **technological disruption**, a **record-breaking migration crisis**, **anxiety over globalization**, **political polarization**, and **rising nationalism**. All are symptoms of failed policies that could turn out to be **trigger points** for a future crisis. Voters have good reason to be frustrated, but the emotionally appealing populists to whom they are increasingly giving their support are offering ill-advised solutions that will only make matters worse. For example, despite the world’s unprecedented interconnectedness, **multilateralism is increasingly being eschewed**, as countries – most notably, Donald Trump’s US – pursue unilateral, isolationist policies. Meanwhile, **proxy wars** are **raging** in Syria and Yemen. Against this background, we must take seriously the possibility that the next economic crisis could lead to a **large-scale military confrontation**. By the logic of the political scientist Samuel Huntington , considering such a scenario could help us avoid it, because it would force us to take action. In this case, the key will be for policymakers to pursue the structural reforms that they have long promised, while replacing finger-pointing and antagonism with a sensible and respectful global dialogue. The alternative may well be **global conflagration**.

### 1NC – OFF

#### The member nations of the World Trade Organization should apply an extraction fee on private sector greenhouse gas emissions. In the United States specifically the tax should start at $43/ton CO2e.

#### The CP solves climate change --- the electricity sector is key.

Kaufman, Obeiter, & Krause 16 (Noah Kaufman, economist for the US Climate Initiative in the Global Climate Program, Michael Obeiter, Senior Associate in World Research Institute’s Global Climate Initiative, and Eleanor Krause, Researcher and Analyst for World Research Institute’s Carbon Pricing program, “Putting a Price on Carbon: Reducing Emissions,” January 2016, <https://www.wri.org/sites/default/files/Putting_a_Price_on_Carbon_Emissions.pdf>)

Electricity Sector 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. Very Short-run Response to a Carbon Price in the Electricity Sector 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 (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. Long-run Effects of Carbon Pricing in the Electricity Sector 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). Forecasts of Emissions Reductions in the Electricity Sector 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.Very Long-run Effects of Carbon Pricing in the Electricity Sector For the United States to meet its goal of over 80 percent emissions reductions by 2050, a transformation of the electricity sector is essential. This will occur only through the development and scaling of new technologies. Most studies of carbon pricing focus on the effects described above because they are relatively predictable. We can measure how consumer demand changes with electricity prices and how low-carbon supply options become more competitive when a carbon price is implemented. But CO2 stays in the atmosphere for hundreds of years and, while the climate is changing today, the worst damages from climate change are decades or centuries away. For that reason, the most important effects of carbon pricing occur over a long-term time scale. A major benefit of carbon pricing policies is that they encourage technological change, so the menu of cost-effective low-carbon alternatives available to producers and consumers will expand over time. The process that drives technological change is complex and not entirely understood. It includes the invention of new technologies, improvements to existing technologies, and the adoption and diffusion of technologies throughout the economy (Jaffe et al. 2003). We refer to inducing technological change as a “very long-run” effect because it can take decades for new technologies to mature, but the advancements can occur quickly as well (particularly improvements and cost reductions for existing technologies). Private businesses fund over 60 percent and perform over 70 percent of total R&D in the United States, with industry responsible for even larger portions of applied research and product development (Newell 2015). A carbon price increases incentives for private businesses to invest in low-carbon technologies because it affects the expected return on investments.