# Assessing the Risks and Opportunities of Climate-Related Regulation and Litigation for the U.S. Power Sector


**October 2018**

Kyle Danish
Gabriel Tabak
Robin Rotman

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## Executive Summary

This White Paper analyzes risk and opportunities facing the electric power sector in the next 10 years from climate change-related regulation and litigation.

In the near-term, the landscape for federal climate policy in the United States is uncertain. The Trump Administration is taking steps to unwind climate policies developed under the Obama Administration, including the Clean Power Plan.

However, this White Paper concludes that, in the next ten years, the U.S. power sector faces significant risks of climate-related regulation and litigation. The White Paper identifies and analyzes risks in three areas: federal regulations, state and local policies, and litigation. The paper also finds that climate-related regulation offers a major opportunity for the power sector in the form of policies that promote greater electrification of other sectors, which could boost currently stagnating demand for power generation.

To be clear, the paper does not reach conclusions about whether particular regulatory pathways or lawsuit theories are legally valid or invalid. Rather, the White Paper is a risk analysis; it identifies and evaluates a range of ways that climate change regulatory requirements or lawsuits could develop. In addition, to simplify the analysis, the White Paper focuses on existing law; the paper does not attempt to predict whether Congress will enact new Federal climate legislation.

An important finding of this White Paper is that there is significant cumulative potential for new climate-related policies and litigation in the next 10 years. Even if the probability of any particular policy or litigation outcome may be relatively low, the number and variety of pathways is great enough to result in substantial aggregate risk. Further, the pathways interact with one another; foreclosure of one pathway tends to make other pathways more likely. For example, rolling back Federal climate regulations makes it more likely that there will be more robust policy-making efforts in the states and more resources thrown behind litigation in the courts.

Below is a summary of the White Paper's conclusions and key findings.

## Federal Regulatory Pathways

The Trump Administration's Environmental Protection Agency (EPA) has proposed to repeal the policy that imposes the most significant federal climate-policy obligations on the power sector: the Clean Power Plan. The Trump EPA also is soliciting public comment on whether and how to replace the Clean Power Plan. One option it is exploring is replacing the Clean Power Plan with a more lenient rule under Section 111 of the Clean Air Act: the Affordable Clean Energy Rule.

However, these near-term actions by the Trump Administration will not eliminate the long-term prospect for stringent carbon dioxide ($CO_2$) limits for the power sector under the Clean Air Act.

First, it is possible that the Judicial Branch will reject the Trump Administration's efforts to repeal the Clean Power Plan. More significantly, even if the Trump Administration's ultimate rulemaking is affirmed by the judiciary, the power sector cannot count on the actions of the Trump Administration to close the door to regulation by a future administration that is more motivated to address climate change. Such an administration, even without action by Congress, would continue to have multiple pathways available for regulation—whether under Section 111 or other provisions of the Clean Air Act.

Furthermore, there is a possibility that $CO_2$ limits established by a future administration will be substantially more stringent than the Clean Power Plan. Even though power sector $CO_2$ emissions have declined considerably in recent years (27% since 2005), a subsequent administration could conclude that much more needs to be done to put the power sector on a path to "deep decarbonization."

## State and Local Policy Pathways

In addition to prospects for policies at the federal level, the power sector faces potential requirements and pressures from state and local climate policies. In the near-term, states and cities may be motivated by a perceived need to fill a gap in federal climate policies. The last two years have seen a surge of state and local policy commitments.

There are already a number of different types of state and local regulatory policies that affect entities in the power sector, including cap-and-trade programs, unit-specific emission performance standards, renewable portfolio standards, and energy efficiency standards. In the next 10 years, it is possible that jurisdictions could make these policies more stringent, and jurisdictions that have not yet adopted such policies could adopt them.

## Climate Litigation Pathways

Entities in the power sector also face the prospect of climate change-related litigation. Of most direct import is litigation claiming that companies that produce or combust fossil fuels should be held liable for causing harms from climate change. Today, such tort-style lawsuits face high jurisdictional and evidentiary hurdles. However, plaintiffs' lawyers are working to crack the code for such litigation, and can be expected to continue coming forward with new theories and strategies.

Other types of lawsuits also present a risk for the sector, including lawsuits to identify a constitutional or trust-based duty for the government to impose climate policies. If successful, these lawsuits could establish a backstop obligation for governmental policies that could apply even if Congress enacted a law precluding GHG regulation.

Although there are high obstacles to obtaining decisive verdicts in these cases, climate-related litigation could nonetheless drain resources from the power sector and impose reputational harm.

## Opportunities from Electrification Policies

The prospects of new or expanded Federal and state climate policies create not only risks for the U.S. power sector, but also a significant potential opportunity: increased electricity demand. This increased demand would come from policies promoting electrification of other sectors of the economy. Some long-term climate mitigation models contemplate nearly doubling the amount of electricity generation in order to satisfy the electrification priorities of other sectors.

The rate at which federal and state policymakers adopt electrification measures will be a function, at least in part, of the rate of decarbonization of the power sector. Power sector entities that decarbonize their portfolios can help smooth the pathway for policy-makers to adopt broad-based electrification. In addition, power sector entities that reduce their emissions profile will find it easier to meet the growing demand from electrification; they will not have to invest as much in emission controls or allowances to increase their generation. In these ways, risk management and opportunity management could be two sides of the same coin.

## Conclusions

This White Paper concludes that power sector entities will be subject to significant risks of new climate-related regulation and litigation over the next ten years. To be sure, future carbon constraints are not certain. However, the White Paper identifies many possible regulatory pathways. Future regulatory mandates on the power sector could be significantly more stringent than the climate policies that have been considered to date. Moreover, plaintiffs' lawyers will continue to test creative litigation theories and new cases against emitters. Collectively, these factors establish significant cumulative risk to the power sector over the next 10 years.

Accordingly, the White Paper concludes that the long-term risks to the power sector from climate regulation or litigation are significant and that entities in the sector should take reasonable steps to integrate the potential for such outcomes into their resource planning and management. Failure to manage the possibility of new policies or litigation could expose power sector entities to adverse economic impacts, such as stranded assets and lost profits.

However, climate policy could also have a silver lining for the power sector in the form of increased electrification of the transportation sector and other sectors of the economy, creating substantial new market opportunities. Efforts by power sector entities to decarbonize their portfolios could make it easier for those entities to reap the benefits from such policies. Accordingly, power sector entities should plan and manage with an eye to both the risks of and potential opportunities arising from future climate policies.

## Summary of Key Findings

- If the Trump EPA repeals the Clean Power Plan, it is possible that its repeal will not survive judicial review, which would leave the rule in effect. The Trump EPA is most likely to prevail if it follows through on efforts to replace the Clean Power Plan however, even this approach is vulnerable. The potential for judicial reversal is highest if the Trump EPA attempts to repeal the Clean Power Plan on the basis of the Section 112 Exclusion or on the basis of a repeal of the 2009 Endangerment Finding (neither of which is the basis for EPA's current proposals).
- Even if the Trump EPA's rulemaking action to repeal the Clean Power Plan survives judicial review, there is a significant possibility that a future EPA will be able to promulgate a new, even more stringent Section 111(d) rule limiting $CO_2$ emissions from power plants.
- Regardless of how the Trump EPA's actions on the CPP fare in court, it is also possible that a future EPA could use other authorities under other sections of the Clean Air Act to promulgate GHG regulations affecting power plants. Legal scholars, and EPA itself, have identified a range of potential regulatory pathways available under the Clean Air Act.
- Although the power sector has reduced its $CO_2$ emissions substantially in recent years, the sector faces the possibility of future $CO_2$ limits that are substantially more stringent than the Clean Power Plan—particularly if a future administration is motivated to make up lost ground on the road to "deep decarbonization."
- Many states and localities have pledged to implement climate and clean energy policies in response to the Trump Administration's policies. Numerous jurisdictions already have such policies, ranging from cap-and-trade regulations to renewable portfolio standards to "customer choice" policies. State and local governments could potentially increase the stringency of existing policies or implement new policies that require decarbonization.
- Power sector entities face risks from climate-related litigation. The most significant risk is from tort-style lawsuits seeking to hold energy companies liable for climate-related damages. The sector also could be affected by lawsuits aimed at establishing a constitutional or other underlying duty for governments to implement policies to regulate GHGs. While climate-related litigation currently faces high hurdles, climate-related litigation could drain resources and impose reputational/brand harm.
- The possibility of expanded federal and state climate policies creates a potential market opportunity for power sector entities in the form of increased electrification of the economy. "Deep decarbonization" studies contemplate doubling consumption of electricity in the United States by mid-century. Because of the potential for electrification, risk mitigation and opportunity management could be two sides of the same coin for the power sector. Power sector entities that decarbonize their portfolios can both reduce their exposure to regulation and smooth the pathway to increased revenues from broad-based electrification.

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# Introduction

The landscape of climate change policies in the United States has shifted dramatically at the federal level, where there are vigorous efforts by the Trump Administration to roll back the Clean Power Plan[1] and other climate policies put in place during the Obama Administration. At the same time, a number of states and cities are moving forward with their own policies. New types of climate-related litigation are appearing in the courts. These developments are creating policy and legal uncertainty for the U.S. electric power sector, which has to make long-term plans about investments and resources.

This White Paper provides an independent legal analysis of this shifting landscape.[2] It examines legal risks to the power sector from climate regulations or climate-related litigation in the next 10 years.

This White Paper concludes that, notwithstanding current uncertainties, these risks remain significant. There are multiple plausible avenues for future climate-related regulation and litigation. Power sector entities would be well-advised to plan and manage with an eye to their exposure to potential regulation and litigation.[3] Some leading power companies are recognizing this imperative.[4]

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[1] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) [hereinafter, Clean Power Plan].

[2] This White Paper was commissioned as an independent legal analysis by the Environmental Defense Fund. The authors appreciate the valuable input of Sam Kalen, Centennial Distinguished Professor of Law, University of Wyoming School of Law. The authors also benefited from input provided through a workshop organized by the Center for Strategic and International Studies. The White Paper does not necessarily represent the views of the Environmental Defense Fund, any other clients of Van Ness Feldman, or the Center for Strategic and International Studies. All errors and omissions are the authors' own.

[3] This White Paper focuses on risk from climate-related policies and litigation. The paper does not analyze risks to the power sector from climate change itself. Other papers have examined this latter issue. *See, e.g.*, Poulomi Ganguli, Devashish Kumar & Auroop R. Gangul, *US Power Production at Risk from Water Stress in a Changing Climate*, 7:11983 SCI. REPS. 1 (2017), *available at* https://www.nature.com/articles/s41598-017-12133-9.pdf; U.S. Dep't of Energy, U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather, DOE/PI-0013 (July 2013), *available at* https://energy.gov/sites/prod/files/2013/07/f2/20130710-Energy-Sector-Vulnerabilities-Report.pdf.

[4] *See, e.g.,* Dominion Energy, Virginia Electric and Power Company's Report of Its Integrated Resource Plan, Transmittal Letter at 1, Va. State Corp. Comm'n & N.C. Utils. Comm'n, Case No. PUR-2018-00065 and Docket No. E-100-157 (filed May 18, 2018), *available at* https://www.dominionenergy.com/library/domcom/media/about-us/making-energy/2018-irp.pdf (stating that the company's Integrated Resources Plan "reflects the Company's belief that regulation of power station [$CO_2$] emissions is virtually assured in the future, either through new federal initiatives or through measures adopted at the state level."); Am. Elec. Power, *American Electric Power: Strategic Vision for a Clean Energy Future 2018* at 6 (Feb. 2018), *available at* http://aep.com/investors/docs/AEP2018CleanEnergyFutureReport.pdf:

For the power sector, identifying and managing long-term policy risks and opportunities is vital. The sector is highly capital-intensive. Power sector entities make significant investments in long-lived capital equipment. For these reasons, investors and utility regulators expect power entities to develop and disclose long-term plans that take into account risks resulting from future public policies and litigation. Climate-related policies and litigation are of particular significance for the power sector because the sector's financial exposure to carbon constraints is substantial.[5]

To be sure, climate-related policies and litigation are not the only risk facing the U.S. power sector. Rapid changes in technology, municipalization, erosion of demand by distributed resources, and cyber-attacks are just a few of the other risks that power sector entities must assess and manage. Nonetheless, even if climate-related policies and litigation are not the only risks facing the sector, they are significant risks, and they interact with some of the other risks.

Entities in the power sector need to evaluate their exposure to future climate policies and litigation against a backdrop of other factors that are driving increased investment in low- or zero-emitting generation resources. The sector is in the midst of a historic shift, which already has lowered power sector carbon dioxide emissions by 27% since 2005.[6] There have been multiple drivers behind this shift, including: lower prices for natural gas;[7]

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> We believe that regardless of the outcome of the Clean Power Plan, there is likely to be some form of carbon regulations in the future. Over the course of the past decade, AEP has taken steps to prepare for this eventual outcome in a number of ways, including factoring carbon into our resource and investment planning processes and our business strategy. Today, we are taking a longer-term view of carbon by setting new goals for carbon dioxide emission reductions for the future based upon resource plans that account for economics, customer preferences, reliability and regulations. The [EPA] action to repeal the Clean Power Plan creates uncertainty for near-term regulatory action on climate change. Regardless, AEP's stakeholders are asking us about our plans for sustainable electricity, including a reduction in $CO_2$ emissions. We believe this is a fair question.

[5] *See, e.g.*, Anthony Paul, Blair Beasley & Karen Palmer, *Taxing Electricity Sector Carbon Emissions at Social Cost*, RES. FOR THE FUTURE (2013), *available at* http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-23-REV.pdf (modeling impacts to the power sector from a carbon tax based on the "social cost of carbon", including increasing electricity prices, diminishing consumption, and shifting generation investments).

[6] U.S. Energy Info. Admin., *Monthly Energy Review* at 187, Table 12.6 (May 2018), *available at* https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf.

[7] *See, e.g.,* U.S. Energy Info. Admin., *Natural Gas Prices in 2016 were the Lowest in Nearly 20 Years* (Jan. 13, 2017), https://www.eia.gov/todayinenergy/detail.php?id=29552#; Jude Clemente, *Why U.S. Natural Gas Prices Will Remain Low*, FORBES (Sept. 24, 2017), https://www.forbes.com/sites/judeclemente/2017/09/24/why-u-s-natural-gas-prices-will-remain-low/#4649a5243783; Chris Mooney, *How Super Low Natural Gas Prices are Reshaping How We Get Our Power*, WASH. POST (Oct. 28, 2015), https://www.washingtonpost.com/news/energy-environment/wp/2015/10/28/how-super-low-natural-gas-prices-are-reshaping-how-we-get-our-power/?utm_term=.5e7684c907c6; Joshua Linn & Kristen McCormack, *The Roles of Energy Markets and Environmental Regulation in Reducing Coal-Fired Plant Profits and Electricity Sector Emissions*, RES. FOR THE FUTURE (2017), *available at* http://www.rff.org/files/document/file/RFF%20Rpt-NOx%20Costs.pdf.

decreasing costs of renewable generation technologies;[8] current and expected future regulations focused on non-greenhouse gas pollutants such as ozone, fine particulate matter, and mercury;[9] shareholder pressure;[10] flattening overall demand for electricity;[11] and increased consumer demand for clean energy, particularly from larger corporate purchasers of electricity.[12] An analysis of these non-legal factors is outside the scope of this paper, but they provide independent reasons for power sector entities to adopt decarbonization strategies. Moreover, these other factors, coupled with the increasing volume of scientific evidence of harms from climate change, will inform future decisions by policymakers. They are likely to be a source of demand for more stringent future mandates.

To be clear, this White Paper does not reach conclusions about whether particular policy pathways or lawsuit theories are legally valid or invalid. The paper does not predict, for example, the outcomes of future litigation over the use of particular authorities under the Clean Air Act[13] to establish $CO_2$ limits on power plants. Rather, the White Paper includes a legal risk analysis examining existing laws.[14]

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[8] *See, e.g.,* Lazard, Lazard's Levelized Cost of Energy Analysis – Version 11.0 at 11 (Nov. 2, 2017), *available at* https://www.lazard.com/media/450337/lazard-levelized-cost-of-energy-version-110.pdf; Nat'l Renewable Energy Lab., *U.S. Solar Photovoltaic System Cost Benchmark: Q1 2017* at viii (Aug. 2017), *available at* https://www.nrel.gov/docs/fy17osti/68925.pdf ("[T]he reductions in installed cost, along with improvements in operation, system design, and technology have resulted in significant reduction in the cost of electricity"); Robert Fares, *The Price of Solar is Declining to Unprecedented Lows*, SCI. AM. (Aug. 27, 2016), https://blogs.scientificamerican.com/plugged-in/the-price-of-solar-is-declining-to-unprecedented-lows/.

[9] *See, e.g.,* Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, 81 Fed. Reg. 74,504 (Oct. 26, 2016); National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,292 (Oct. 26, 2015); National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304 (Feb. 16, 2012). There is a risk that these rules could become more stringent over time.

[10] Fin. Stability Bd., *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures* at 5 (June 2017), *available at* https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf; Hiroko Tabuchi, *Tell Investors of Climate Risks, Energy Sector Is Urged*, N.Y. TIMES (Dec. 14, 2016), https://www.nytimes.com/2016/12/14/business/energy-environment/global-panel-urges-companies-to-disclose-climate-change-risks.html.

[11] Mark Chediak, *U.S. Power Demand Flatlined Years Ago, and It's Hurting Utilities*, BLOOMBERG (Apr. 25, 2017), https://www.bloomberg.com/news/articles/2017-04-25/u-s-power-demand-flatlined-years-ago-and-it-s-hurting-utilities.

[12] *See, e.g.,* Grace Donnelly, *Google Just Bought Enough Wind Power to Offset 100% of Its Energy Use*, FORTUNE (Dec. 1, 2017), http://fortune.com/2017/12/01/google-clean-energy/; Deloitte, *Serious Business: Corporate Procurement Rivals Policy in Driving Growth of Renewable Energy* (2017), *available at* https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-er-corporate-procurement-renewable-energy-report.pdf; Julia Pyper, *The Latest Trends in Corporate Renewable Energy Procurement*, GREENTECH MEDIA (June 30, 2017), https://www.greentechmedia.com/articles/read/the-latest-trends-in-corporate-renewable-energy-procurement#gs.QAKIECQ.

[13] 42 U.S.C. §§ 7401 et seq. [hereinafter, CAA].

[14] The question of whether Congress or individual state legislatures will enact or preempt climate-related laws is a political analysis that is beyond the scope of this White Paper.

The paper considers legal arguments put forth in a number of sources. In some instances, the paper identifies legal arguments in scholarly literature. In other instances, a key agency has itself invoked the possibility of implementing the pathway. In still other cases, the pathway already has been implemented in some form and validated by the courts. For the last category, the paper focuses on the possibility that the type of regulation or litigation could expand in scope or impact. The White Paper also identifies arguments against the legal validity of the specified regulatory or litigation pathway.

The White Paper does not attempt to quantify risks. In particular, the paper does not estimate the specific probability that an identified pathway will be implemented, nor does it estimate the financial consequences to the power sector that would result from such implementation.

Even without such quantification, however, it is possible to draw some clear conclusions. First, if there is a President in the next ten years that wants to regulate power plant GHG emissions, that President could have multiple avenues from which to choose. This paper identifies a number of workable Federal regulatory pathways. Even if the current administration effectively puts climate policies on pause, power companies cannot count on indefinite relief from stringent regulation or litigation.

Indeed, even if the probability of implementation of certain individual policy-related or litigation pathways is relatively low, the number and variety of pathways is great enough to result in substantial aggregate risk. In addition, the pathways interact with one another; foreclosure of one pathway tends to make other pathways more likely. For example, rolling back federal climate regulations makes it more likely that there will be more robust policy-making efforts in the states and more resources behind litigation in the courts.

### Disclosure Issues

There is growing world-wide interest among shareholders and others in the financial community about the climate-related risks facing companies. One objective of this White Paper is to contribute to this public discussion by providing a comprehensive legal analysis of sources of policy and litigation risks and opportunities facing the U.S. power sector, including investor-owned utilities. The analysis in the White Paper could help investors ask better questions and companies provide better answers about the impacts of various scenarios for future climate policies.

One dimension of the public discussion on corporate climate risks focuses on the particular legal obligations related to disclosure of forward-looking information. Under U.S. securities laws, a company's failure to properly disclose "material" information could expose the company to penalties and shareholder lawsuits. Many shareholders are bringing proxy actions demanding more disclosure on these grounds. A legal analysis of disclosure, materiality, and proxy actions is outside the scope of the White Paper. We do not analyze each of the policy and litigation pathways identified in the White Paper against a materiality standard, nor do we opine on legal requirements or best practices for disclosure. However, the White Paper does conclude that the risks and opportunities from climate-related policy and litigation are significant enough that investor-owned utilities should engage in a robust assessment and discussion of these risks and opportunities with their shareholders and other stakeholders.

Furthermore, growing scientific evidence of the harmful impacts of climate change means that future mandates on the power sector could be substantially more stringent than the climate policies that have been considered to date. And because the financial sensitivity of the power sector to climate regulation and litigation is significant, it is reasonable to conclude that the impacts of such carbon constraints will be significant.

The White Paper identifies multiple pathways for potential future regulatory policies or court decisions. With some exceptions, however, the White Paper does not analyze all of the different ways that a particular policy or court order could be structured. As a result, the White Paper does not address the further risk that any particular policy or court order could be implemented in a suboptimal way, e.g., by setting an unreasonably precipitous emissions target, by unnecessarily constraining compliance flexibility, or by imposing unduly harsh penalties or fines. In addition, the White Paper does not evaluate risks presented by subpar or arbitrary administration of a particular policy or order.

For these reasons, the White Paper concludes that the long-term potential that the power sector will face costly climate-related regulation or litigation is significant and that entities in the sector should take steps to factor this potential into their planning and management. Power sector entities that fail to manage these risks could incur adverse economic impacts, such as stranded assets and reduced profits; entities in deregulated markets could lose ground to competitors. Furthermore, if such power sector entities are investor-owned utilities, it is conceivable that they could be subject to obligations to disclose these risks to shareholders.[15]

Finally, while future climate policies entail risk for the power sector, they also offer an opportunity: increased electrification of the U.S. economy. Future climate policies are likely to promote increased electrification of the transportation, buildings, and industrial sectors as a strategy for moving those sectors away from direct combustion of fossil fuels. The upside potential from such policies for the power sector is sizable. Some long-term climate mitigation models contemplate nearly doubling the amount of electricity generation in order to satisfy the electrification priorities of other sectors. The rate at which electrification policies are adopted will be a function of many factors, but one likely factor will be the rate at which the power sector reduces its carbon intensity. Accordingly, power sector entities should manage not only the risks but also the potential opportunities arising from future climate policies.

This White Paper analyzes risks and opportunities in four sections.

***Section I analyzes federal regulatory pathways***. Section I examines the possibility that the Trump Administration's current efforts to repeal the Clean Power Plan will not survive

[15] Financial Stability Board Final Report, *supra* note 10, at 5.

judicial review, thereby leaving the Clean Power Plan in place. Section I also analyzes the possibility that, even if the Trump Administration's efforts are successful, their actions will not foreclose the possibility that a future administration will impose more stringent regulations—whether under the same provision of the Clean Air Act or under other provisions. Finally, Section I explains why future regulations could be substantially more stringent than the Clean Power Plan.

***Section II analyzes state and local policy pathways***. Section II reviews the variety of climate or clean energy-related policies already adopted by many states and cities. It examines the possibility that these jurisdictions will make these policies more stringent, or that other jurisdictions will adopt the same kinds of policies.

***Section III analyzes litigation pathways.*** Section III examines the potential evolution of two categories of litigation: (1) tort-style lawsuits against energy companies to hold them liable for damages from climate change; and (2) lawsuits against federal and state governments to establish a constitutional or other duty to enact policies to limit greenhouse gas emissions.

***Section IV analyzes opportunities from climate policy.*** Section IV examines the potential opportunities to the power sector from policies to electrify other sectors of the economy.

**Disclosure Issues**

This White Paper identifies analyzes risks and opportunities from climate-related policy and litigation; but the White Paper does not opine on best practices for managing those risks and opportunities. An assessment of how power sector entities ought to manage their exposure to potential future GHG regulations is outside the scope of the paper. Nonetheless, for the benefit of the reader, the body of the paper includes text boxes that provide short summaries of how some different entities have responded to the issues. The featured entities are relatively diverse; they are from different parts of the country, and are subject to different types of rate regulation. We emphasize that the summaries are intended to be only descriptive. They do not reflect our judgment about what constitute "best practices" for risk and opportunity management.

# I. Federal Regulatory Pathways

The starting point for this White Paper's evaluation of federal policy is an evaluation of authorities available under existing federal law.

To be sure, in the next 10 years, it is possible that Congress will enact a new law that limits GHG emissions from the power sector, possibly through an economy-wide program. The probability of this kind of outcome is difficult to assess. It entails a political analysis beyond the scope of this paper.

Even without an in-depth political analysis, however, it is reasonable to assume that there will be a presidential administration in the next ten years interested in implementing climate change mitigation policies—whether due to public opinion, scientific findings, imperatives of diplomacy, or other motivations. It is also reasonable to assume that, absent action by Congress, such an administration will look to legal authorities available under existing laws.

**Action by Congress**

The analysis in this White Paper is subject to an important simplifying assumption: it does not include an analysis of potential actions by Congress. To be clear, this does not mean that we have concluded that the possibility of Congressional action is remote or that the impact of such action would be slight. Indeed, it is conceivable that Congress could enact a far-reaching climate law in the next 10 years—such as a carbon tax, a cap-and-trade program, or a clean energy standard—that would have significant impacts on the power sector. However, as lawyers, we are best suited to analyzing potential policies or judicial decisions under existing law. Analyzing future Congressional actions to create new laws entails a level of speculation and political analysis that is beyond the scope of the legal analysis in this white paper. For this reason, this legal analysis focuses on possible outcomes under existing law.

Accordingly, this White Paper's evaluation of federal policy pathways is an assessment of existing legal authorities. The paper focuses in particular on authorities potentially available under the federal Clean Air Act, which has been the primary authority for federal regulation of air pollutants since its enactment in 1970.

Whether the Clean Air Act will provide a near term avenue for climate policy is currently in dispute. In particular, as explained in Section I.A. below, the Trump Administration has proposed to repeal the Clean Power Plan, which was promulgated under Section 111 of the Clean Air Act, and replace it with a new rule based on heat-rate improvements at coal-fired power plants.[16] The Trump Administration is also revisiting the Carbon Pollution

[16] Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (Oct. 16, 2017) [hereinafter, CPP Repeal Proposed Rule]; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program, 83 Fed. Reg. 44,746 (Aug. 31, 2018) [hereinafter, Proposed Affordable Clean Energy Rule].

Standards Rule,[17] a Section 111 regulation affecting $CO_2$ emissions from new or modified power plants.[18]

However, for three reasons, near-term actions by the Trump Administration will not eliminate the long-term risk that the power sector will be subject to stringent $CO_2$ limits under the Clean Air Act. First, as explained in Section I.B., it is not a given that the Trump Administration will be successful in unwinding the existing Section 111 regulations limiting $CO_2$ emissions from power plants. Second, as explained in Section I.C., even if the Trump Administration does unwind those regulations, the approach the Trump Administration adopts could leave in place residual regulatory authority under section 111 that a future administration could use. Third, as explained in Section I.D., even if the Trump Administration unwinds the Clean Power Plan in such a way as to weaken or eliminate Section 111 as a basis for regulating power plant $CO_2$ emissions, a future administration might avail itself of other authorities under the Clean Air Act to establish such limits. Furthermore, as explained in Section I.E., if a future EPA establishes new $CO_2$ limits on the power sector, there is a possibility that it will adopt even more stringent limits than those reflected in the Clean Power Plan.

### A. Background on the Section 111 Power Plant Regulations

During the Obama Administration, EPA promulgated two regulations under Section 111 of the Clean Air Act to establish $CO_2$ limits for the power sector: the Carbon Pollution Standards Rule and the Clean Power Plan.

Section 111 directs EPA to identify categories of emission sources that "cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[19] For new and (certain) modified sources in an identified category, EPA is required to establish "standards of performance." Section 111 defines such a standard as reflecting the "degree of emission limitation achievable through the application of the best system of emission reduction . . . [that the EPA] determines has been adequately demonstrated."[20] This is often described as an emission limit based on what EPA determines to be the "best system of emission reduction" or "BSER."

Section 111(d) provides that—under certain circumstances—if EPA has established a standard of performance for new and modified sources in a category, EPA must also approve standards of performance for *existing* sources in that category.[21] Section 111(d)

[17] Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,510 (Oct. 23, 2015) [hereinafter, Carbon Pollution Standards Rule].
[18] Review of the Clean Power Plan, 82 Fed. Reg. 16,329 (Apr. 4, 2017).
[19] CAA § 111(b)(1)(A).
[20] *Id.* § 111(a)(1).
[21] *Id.* § 111(d).

establishes a federal-state process for determining and implementing such standards. In this process, EPA establishes an "emission guideline" for the states. The states use these guidelines to develop plans establishing enforceable requirements for the affected facilities. The states submit these plans for approval by EPA.[22]

In 2015, the Obama Administration EPA finalized the Carbon Pollution Standards Rule, which established Section 111(b) $CO_2$ standards for new, modified, and reconstructed fossil fuel-fired power plants. In the same year, the Obama Administration EPA finalized the Clean Power Plan, which established Section 111(d) $CO_2$ standards for existing fossil fuel-fired power plants. Of the two, the latter would have broader reach and impact on the power sector, and therefore is the focus of the discussion that follows.

In the Clean Power Plan, the Obama EPA established the standards of performance for existing plants by determining that the "best system of emission reduction" for such plants consisted of a combination of emission reduction measures that could be adopted by modifying existing fossil-fired plants (sometimes referred to as "inside-the-fence" measures) and also measures that would promote shifting of generation from higher-emitting to lower- or zero-emitting generation resources (sometimes referred to as "outside-the-fence" measures). The inside-the-fence measures assumed in the Clean Power Plan consist primarily of measures that would upgrade the efficiency of coal-fired power plants; these account for a relatively small amount of the expected emission reductions. This portion of the methodology is referred to as "Block 1."[23] Outside-the-fence measures consist of measures that would shift generation from coal-fired plants to gas-fired plants ("Block 2") and from fossil-fired plants to renewable generation resources ("Block 3"). These generation-shifting measures account for a far greater quantity of emission reductions.[24]

[22] *See generally* 40 C.F.R. Part 60, Subpart B.
[23] Clean Power Plan, *supra* note 1, at 64,709.
[24] *Id.*

On the basis of these determinations, the Clean Power Plan establishes two types of national uniform emission rate (lbs $CO_2$/MWh) limits; one for largely coal-fired steam power plants and another for largely natural gas-fired combined cycle power plants.[25] From these limits, the Clean Power Plan derives state-specific goals based on the distribution of affected plants in each state.[26] One set of goals applies as an interim goal, which phases in over the period from 2022-2029. Starting in 2030, each state is subject to a more stringent emission goal. The rule affords states different options for enforcing the goals. One option is for a state to apply the emission rate limits directly on affected power plants. Alternatively, states may apply sector-wide limits on total emissions or emission rates from power plants within their borders. States adopting these approaches may also engage in intra- or interstate emissions trading.[27]

### American Electric Power

American Electric Power (AEP) is an investor-owned utility that owns 26,000 MW of power generation across 11 states. AEP has said that efforts to repeal the Clean Power Plan create "uncertainty for near-term climate change regulatory action;" but, regardless of the outcome of repeal efforts, "there is likely to be some form of carbon regulations in the future."

AEP has been setting emissions reduction targets since 2003. In 2017, the company set an intermediate goal of reducing its $CO_2$ emissions by 60% from 2000 levels by 2020 and a long-term goal of achieving emissions reductions of 80% below 2000 levels by 2050. AEP's announced steps for reaching its emissions goals include: upgrading transmission infrastructure; implementing energy efficiency and demand response programs; retiring coal-fired units once they reach the end of their useful lives (next 10-20 years); and adding upwards of 8,000 MW of renewables by 2030.

AEP has expressed support for electrifying other sectors of the economy, including transportation, as a means to reduce GHG emissions and conventional pollutants. AEP expects adoption rates of electric vehicles to be "lower and slower [than other parts of the United States] because of the socio-economic makeup of [its] service territory."

For more information, see:
American Electric Power, Strategic Vision for a Clean Energy Future (2018), *available at* http://aep.com/investors/docs/AEP2018CleanEnergyFutureReport.pdf
American Electric Power, EEI ESG/Sustainability Pilot, *available at* https://www.aepsustainability.com/about/docs/AEPEEIESGSustainabilityPilot-1-2-18.pdf.

Several states, power companies, and industry associations petitioned for review of the Clean Power Plan in the D.C. Circuit. These petitioners also requested that the D.C. Circuit stay the enforcement of the Clean Power Plan pending the outcome of the litigation. When the D.C. Circuit denied this motion,[28] the petitioners asked for a stay from the Supreme Court, which granted that relief in February 2016.[29]

The D.C. Circuit heard oral argument on the merits of the petitions in September 2016. After the 2016 election—and before the D.C. Circuit had issued a decision—the Trump Administration EPA asked the court to hold the litigation in abeyance on the grounds that it

[25] *Id.* at 64,667.
[26] *Id.*
[27] *Id.*
[28] Order, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Jan. 21, 2016) (per curiam).
[29] *West Virginia v. EPA*, 136 S. Ct. 1000 (2016).

intends to repeal or replace the Clean Power Plan. In April 2017, the D.C. Circuit granted this abeyance motion on a temporary basis, but also required the Trump EPA to file periodic reports on its actions related to the rule.[30] The D.C. Circuit has since provided short-term renewals of the abeyance after receiving progress reports from the EPA.[31]

On October 16, the Trump Administration EPA proposed a rule to repeal the Clean Power Plan.[32] The EPA has also issued a proposed replacement for the Clean Power Plan: the Affordable Clean Energy Rule.[33] At this point, it is not known what final actions the EPA will promulgate with respect to the Clean Power Plan.

### B. The Judiciary Could Reject the Trump EPA's Efforts to Repeal the Clean Power Plan

One prospect facing the power sector is that the Judicial Branch will reject the Trump EPA's efforts to repeal and replace the Clean Power Plan.

In order to evaluate this risk, it is important to understand: (1) the administrative process for repealing or replacing an existing regulation, and (2) the standard of judicial review that a court will apply to a challenge to such an agency action.

Under principles of administrative law, an agency is permitted to repeal or replace an existing regulation, provided it meets certain requirements.[34] It must do so through a notice-and-comment rulemaking. Further, it must demonstrate that the outcome of the rulemaking is permissible under the relevant statute and is the product of reasoned decision-making, based on the established record.[35] The process of completing a notice-and-comment rulemaking typically takes a year or more. Judicial review of the rulemaking can last a similar amount of time.

Federal courts typically review legal challenges to agency interpretations of authorizing statutes using the *Chevron* doctrine.[36] The *Chevron* doctrine outlines a two-step process for judicial review. First, the court determines whether Congress has spoken directly and plainly to the issue in question. If so, the analysis ends at this "Step One," and the agency must follow the unambiguous intention of the Legislative Branch.[37] If the relevant statutory language is silent or ambiguous with respect to the issue, the question is whether

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[30] Order, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 28, 2017) (per curiam) (en banc).
[31] *See, e.g.,* Order, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Nov. 9, 2017) (per curiam) (en banc).
[32] CPP Repeal Proposed Rule, *supra* note 16.
[33] Proposed Affordable Clean Energy Rule, *supra* note 16.
[34] *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29 (1983); *see also Clean Air Council v. Pruitt*, 862 F.3d 1, 8 (D.C. Cir. 2017) ("Agencies obviously have broad discretion to reconsider a regulation at any time.").
[35] *Fed. Commc'ns Comm'n v. Fox Television Stations*, 556 U.S. 502, 515-16 (2009).
[36] *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984).
[37] *Id.* at 843.

the agency's interpretation is based on a permissible construction of the statute. Under such circumstances, the court will determine only whether the agency's interpretation is "reasonable."[38] This *Chevron* "Step Two" analysis is considered a deferential standard of judicial review.

Though the Trump Administration has not finalized what action it will take on the Clean Power Plan, it is possible to identify three potential scenarios for repeal or replacement. Each could be subject to robust legal challenges. What follows is an analysis of three potential scenarios for action by the Trump EPA to repeal or replace the Clean Power Plan, and the risks of judicial reversal under each scenario.

***Scenario 1: Replacing the Clean Power Plan With Section 111(d) Standards Based on Inside-the-Fence Measures.*** The first scenario is reflected in the Trump Administration's two rulemaking actions to date, i.e., the CPP Repeal Proposed Rule[39] and the Proposed Affordable Clean Energy Rule.[40] In the first action, the Trump EPA has proposed to repeal the Clean Power Plan on the grounds that the methodology used for determining the emission standards exceeds EPA's authority under Section 111 of the Clean Air Act. Specifically, the agency proposes to find that the EPA's authority to determine the "best system of emission reduction" is limited to consideration of measures that can be applied to or at an individual stationary source by the source's owner or operator.[41] The agency argues this interpretation precludes EPA's consideration of "outside-the-fence," or generation-shifting, elements of the BSER calculation, i.e., Blocks 2 and 3.[42]

Notably, this proposed interpretation does not entail a determination that EPA is forbidden from regulating $CO_2$ emissions from existing power plants under Section 111(d) of the Clean Air Act, but rather that the particular approach used in the Clean Power Plan is legally invalid.

In the second rulemaking action, the Trump EPA is proposing a new Section 111(d) rule that incorporates an emission guideline calculated on the basis of "inside-the-fence" systems of emission reductions at coal-fired power plants.[43] The proposed "best system of emission reduction" consists of a set of potential heat rate improvement measures; such measures can reduce emission rates.

The Trump EPA could support this repeal-and-replace approach by invoking arguments made by petitioners that challenged the Obama EPA's more expansive interpretation of the

[38] *Id.*
[39] *See generally,* CPP Repeal Proposed Rule, *supra* note 16.
[40] *See generally,* Proposed Affordable Clean Energy Rule, *supra* note 16.
[41] CPP Repeal Proposed Rule, *supra* note 16, at 48,039.
[42] *Id.* at 48,043.
[43] *See generally,* Proposed Affordable Clean Energy Rule, *supra* note 16.

BSER language. In this scenario, however, it would be the EPA itself (not the court) that would be making the more limited interpretation. This is relevant because there is a case to be made that the term "best system of emission reduction" is ambiguous, and therefore Congress delegated to the EPA the authority to interpret it. Accordingly, the judiciary would review the Trump EPA's interpretation under the more deferential *Chevron* Step Two standard. Of the three repeal/replace scenarios in this section of the White Paper, this scenario would put the Trump EPA on the strongest legal footing.

### Portland General Electric

Portland General Electric (PGE) is an investor-owned utility that owns 3,800 MW of power generation in Oregon. In the climate policy arena, PGE has pledged to achieve reductions consistent with the Paris Climate Agreement as a member of the #WeAreStillIn Coalition. In Oregon, it advocates for establishing an economy-wide cap on GHG emissions.

PGE has announced plans to reduce its GHG emissions by more than 80% below 1990 levels by 2050. To achieve its GHG reduction goals, PGE has stated that it is investing in renewables and energy storage, modernizing its electric grid, coordinating with other western states to ensure low-cost clean energy is dispatched in the wholesale market, and investing in flexible load technologies.

According to PGE, "switching vehicles from running on fossil fuels to electricity is an essential step toward a clean energy future." While 40% of Oregon's emissions come from the transportation sector, PGE has determined that electrifying vehicles with low-carbon energy could reduce related GHG emissions by 95%.

For more information, see:
PGE, The Path to a Decarbonized Energy Economy (2018)

Even so, there would remain a possibility of judicial reversal under this scenario. The arguments and outcomes could depend on how EPA makes its case for a change. One possibility is that the EPA asserts that it must change course because the Clean Power Plan is unlawful. Another possibility is that EPA only asserts that it has the discretion to change its interpretation of what is the "best system of emission reduction." If the Trump EPA adopts the first path, petitioners challenging the rule would likely invoke the legal arguments that supported the validity of the Clean Power Plan back in 2016.[44] If the Trump EPA adopts the second legal rationale, then petitioners would likely argue that an emission guideline based on heat rate improvements alone does not reflect reasoned decision-making and does not satisfy the statutory criteria of the "best" system of emission reduction. For example, petitioners likely would argue that a determination that "inside-the-fence" measures are the "best system of emission reduction" unreasonably ignores the "systems" used in practice in the power sector to reduce $CO_2$ emissions, which include generation shifting and credit trading.[45] The petitioners also would likely argue that an inside-the-fence approach based on heat rate improvements would yield much lower emission reductions, and could potentially lead to increased overall emissions if the heat rate improvements cause the regulated plants to increase their overall generation.

[44] *See* Respondent EPA's Final Brief at 25-40, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 22, 2016).
[45] The petitioners might point to documents showing that affected power companies already planned to comply with the Clean Power Plan using such strategies, which could fortify an argument that such strategies are the systems of emission reduction that sector already considered their "best" options.

The petitioners would use these and other arguments to make the case that heat rate improvements alone are not reasonably considered the "best" system of emission reduction, and that the Trump EPA has not met its burden to justify moving away from the determinations underlying the Clean Power Plan.

Alternatively, the petitioners might argue that a generation-shifting approach is consistent with the new interpretation in so far as shifting generation from higher-emitting to low- or zero-emitting resources equates to a reduction in utilization at or by the higher-emitting resources. In other words, they might argue that reduced utilization is an "inside-the-fence" measure. Petitioners might further assert that, given the reductions achievable through reduced utilization, it constitutes the "best" possible inside-the-fence system of emission reductions.[46]

Another potential issue of concern for power sector entities is how the Proposed Affordable Clean Energy Rule addresses state compliance plans. Specifically, EPA has proposed that states should be precluded from relying on market-based approaches that involve trading or averaging among different plants. The agency's primary rationale is that such approaches effectively involve generation-shifting and therefore would be inconsistent with EPA's proposed finding that generation-shifting cannot serve as the foundation for a standard of performance.[47] Some challengers may argue that the approach inappropriately constrains the Clean Air Act's broad grant of compliance discretion to states; others will likely argue that there needs to be symmetry between what is allowed for compliance and what is considered as possible systems of emission reduction. If a court were to determine that EPA is constrained under Section 111(d) to systems of emission reduction that effectively involve the addition of technology at the plant, this would quite plausibly lead future Administrations down the pathway of requiring co-firing with natural gas or carbon capture-and-sequestration as the "best system of emission reduction." potentially with compliance constrained to the addition of technology at the plant. Such systems of emission reduction could result in significant compliance costs.

Accordingly, although this pathway would get the benefit of a deferential standard of review, it would not be invulnerable and could lead to significantly more rigorous and inflexible Section 111(d) standards in the future. There would continue to be a possibility that the Trump EPA would not prevail in litigation or that, even if it prevailed, a resulting

[46] *See, e.g.*, Comments of Professors Daniel A. Farber and Karen Engel re: Request for Comment on Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (October 16, 2017), EPA–HQ–OAR–2017–0355 (Jan. 15, 2018), *available at* https://www.law.berkeley.edu/wp-content/uploads/2018/01/CPP-Rulemaking-Comment-Farber-Engel.pdf.
[47] Proposed Affordable Clean Energy Rule, *supra* note 16, at 44,768.

replacement rule would leave some power sector entities with narrowed flexibility for compliance going forward.

***Scenario 2: Section 112 Exclusion.*** Although the Trump EPA has proposed a replacement rule, opponents of the Clean Power Plan have advocated for other strategies from time to time and might continue to press such alternatives on the agency. One of these alternative repeal strategies would involve the Trump EPA finalizing an alternative interpretation of the Clean Air Act—sometimes referred to as the "Section 112 Exclusion"—which would preclude any regulation of power sector $CO_2$ emissions under Section 111(d).

The Trump EPA's omission of the Section 112 Exclusion in its proposed rulemaking actions might reflect a calculation on its part that the Section 112 Exclusion interpretation does not have the same legal viability as a repeal-and-replace approach.

The Section 112 Exclusion is based on a complicated interaction between Sections 111 and Section 112 of the Clean Air Act. The latter provision prescribes EPA's authority to regulate sources of hazardous air pollutants. As part of amendments to the Clean Air Act in 1990, the Senate and the House passed different changes to Section 111(d). These changes were both enacted but never reconciled, leaving a drafting error in the statute. Each amendment cross-references Section 112, but they read differently. The Senate amendment provides that EPA may regulate existing sources of air pollutants under Section 111(d), provided that the *pollutants* are not regulated under Section 112 (as hazardous air pollutants) or Section 108 (as "criteria" air pollutants). $CO_2$ fits into the category of pollutants not regulated under Section 108 or Section 112. By contrast, some petitioners challenging the Clean Power Plan have argued that the House amendment prohibits EPA from regulating sources of air pollutants under Section 111(d) if the relevant *sources* are subject to regulation under Section 112. This reading of the House Amendment would preclude EPA from regulating $CO_2$ emissions from existing power plants under Section 111(d) because other pollutants from power plants are regulated under Section 112 by reason of the 2012 Mercury and Air Toxics Standards (MATS) Rule.[48]

Over time, the EPA has interpreted the 1990 drafting error in different ways, arriving at different interpretations of the House amendment and different approaches for reconciling that amendment with the Senate amendment. However, the agency has always concluded that the statute allowed for regulation of pollutants under Section 111(d) even if other pollutants from the same sources are regulated under Section 112.[49] In promulgating the

[48] *See generally* Robert R. Nordhaus & Avi Zevin, *Historical Perspectives on § 111(d) of the Clean Air Act*, 44 ENVTL. L. REP. 11,095 (2014).
[49] *Id.*; Brief of the Institute for Policy Integrity at New York University School of Law as Amicus Curiae in Support of Respondent at 5-22, *West Virginia v. EPA*, No. 14-1146 (D.C. Cir. Jan. 30, 2015).

Clean Power Plan, the Obama EPA concluded that EPA retains authority to regulate $CO_2$ emissions from existing power plants under Section 111(d).[50]

In this scenario, the Trump EPA would reverse the Obama EPA's interpretation and adopt the interpretation that Section 112 regulation of toxic emissions from existing power plants precludes regulation of $CO_2$ from those sources. In doing so, it could take up any of the various legal arguments that petitioners challenging the Clean Power Plan used to attack the Obama EPA's interpretation. [51]

However, the inverse also holds. Those who would challenge the Trump EPA's interpretation could utilize arguments that the Obama EPA raised against the Section 112 Exclusion.

The outcome of legal challenges under this scenario could depend on the framework for judicial review adopted by the reviewing courts. One possibility is that the court first determines that Congress intended to delegate interpretive power to the agency. In that case, the court would evaluate the Trump Administration's interpretation under the relatively deferential *Chevron* Step Two standard of review. Under this standard of review, the Trump EPA's interpretation need not be the best or the only possible interpretation; it need only be reasonable.

Even under this deferential standard of review, the Trump EPA would encounter credible counter-arguments that its interpretation was not permissible. Petitioners likely would draw from the arguments the Obama EPA used in the 2016 litigation to assert the unreasonableness of the Section 112 Exclusion interpretation. For example, the Obama EPA raised questions about whether the House amendment even can be read to effect the exclusion claimed by the petitioners. The Obama EPA further argued that, even if such a reading was possible it would be unreasonable because it would practically nullify Section 111(d) by putting nearly every major category of emission sources outside the reach of EPA's Section 111(d) authority.[52] The Obama EPA asserted that such a gap in the coverage of pollutants would be inconsistent with the Clean Air Act's overall scheme.[53] The Obama EPA also made the argument that the Section 112 Exclusion interpretation would result in an anomalous situation in which it would be possible for a category of sources to be regulated under both Section 111(d) and Section 112 but only if the Section 111(d) regulation was promulgated first—implying that EPA's authority to regulate pollutants

[50] Respondent EPA's Final Brief, *supra* note 44, at 78-87.
[51] Petitioners' Opening Brief at 61-74, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 22, 2016).
[52] Respondent EPA's Final Brief, *supra* note 44, at 83.
[53] *Id.* at 84.

from a major category of sources would be contingent on nothing more than the sequencing of regulations.[54]

Finally, petitioners likely would invoke the Supreme Court's decision in *American Electric Power Co., Inc. v. Connecticut*.[55] To be sure, the decision came before finalization of the MATS Rule, and the Court's decision includes only a brief and somewhat unclear discussion of the interplay between Sections 111(d) and 112.[56] However, the Court's 8-0 decision strongly endorsed a general view that the EPA could utilize its Section 111(d) authorities to regulate power plant GHG emissions.[57] The availability of regulation under Section 111 formed the basis of the Court's holding that the Clean Air Act displaced any ability to pursue a climate-related tort action under federal common law against a group of power companies. This decision could raise obstacles to a subsequent finding by the Court that the promulgation of the MATS Rule was sufficient to close the Section 111(d) door.

Accordingly, even under a *Chevron* Step Two review, challengers to the Trump EPA's adoption of the Section 112 Exclusion would have credible legal arguments.

Another possibility is that the court first would determine that the provision was *not* delegated by Congress to the EPA to interpret. Here, the court would determine that the *Chevron* two-step process does not apply at all—or, put another way, that it must apply what has been called a *Chevron* "Step Zero" analysis.[58] Some recent caselaw has suggested that, in situations in which there is conflicting legislative language that could be read in more than one way, the agency's interpretation should *not* be evaluated under a deferential standard; in effect, Congress did not delegate any interpretive authority to the agency in such situations.[59] Were the reviewing courts to adopt this standard of review, it is not possible to predict the outcome of the court's deliberations with certainty, but in any event the Trump EPA would not get the benefit of the deferential *Chevron* Step Two standard of review, and all of the interpretive arguments deployed by the Obama EPA to support its

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[54] During the D.C. Circuit's September 2016 oral argument on the Clean Power Plan, the *en banc* panel appeared to receive some of the petitioners' Section 112 Exclusion arguments with skepticism. At one point, Judge Brett Kavanaugh, a George W. Bush appointee and Trump nominee for the Supreme Court, referred to arguments about the primacy of the House provision as a "hall of mirrors." Coral Davenport, *Appeals Court Hears Challenge to Obama's Climate Change Rules*, N.Y. TIMES (Sept. 28, 2016), https://www.nytimes.com/2016/09/28/us/politics/appeals-court-hears-challenge-to-obamas-climate-change-rules.html.

[55] 564 U.S. 410 (2011) (*AEP*).

[56] *Id.* at 424 n.7.

[57] *Id.* at 424 ("We hold that the Clean Air Act and the EPA actions it authorizes displace any federal common law right to seek abatement of carbon-dioxide emissions from fossil-fuel fired power plants. *Massachusetts* made plain that emissions of carbon dioxide qualify as air pollution subject to regulation under the Act. . . . And we think it equally plain that the Act 'speaks directly' to emissions of carbon dioxide from the defendants' plants.") (citation omitted).

[58] Cass R. Sunstein, Chevron *Step Zero*, 92 VA. L. REV. 187 (2006).

[59] *See generally* Nordhaus & Zevin, *supra* note 48, at 11,103-04.

interpretation of 111(d) would be available to the court. Under this Step Zero scenario, therefore, the prospect of reversal for the Trump EPA would be higher than under a scenario in which the court applies the deferential Step Two standard of review.

Therefore, if the Trump EPA were to adopt the Section 112 Exclusion strategy for repealing the CPP, it would face significant risks of judicial reversal.

***Scenario 3: Reversal of the Endangerment Finding.*** A third alternative scenario would be for the Trump EPA to make a determination that power plant $CO_2$ emissions do not "endanger . . . public health or welfare" in the meaning of Section 111(b). This determination likely would involve the Trump EPA revisiting the Obama EPA's 2009 "endangerment" finding with respect to GHG emissions.[60] This pathway would uproot not only the basis for the Clean Power Plan, but potentially uproot the basis for GHG regulation under other provisions of the Clean Air Act.

To date, the Trump EPA has not proposed repealing the 2009 Endangerment Finding, whether as a basis for repealing the CPP or any other Obama-era GHG regulations.

The Trump EPA would encounter very steep hurdles in implementing this approach. The D.C. Circuit rejected challenges to the sufficiency of 2009 Endangerment Finding in a 2012 decision.[61] Therefore, revisiting the Endangerment Finding likely would require the Trump EPA to identify new scientific data countering the 2009 finding. To be sure, courts tend to defer to the technical and scientific expertise of regulatory agencies. Nevertheless, the science supporting the dangers resulting from anthropogenic sources of GHG emissions is, if anything, more voluminous and robust now than it was in 2009. Indeed, in November 2017, the Trump Administration itself published a report that underscores the link between growing anthropogenic GHG emissions and harmful climate change.[62] Further, the power sector still contributes a sizable fraction of total U.S. GHG emissions, and is by far the largest stationary source category of emissions.[63]

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[60] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) [hereinafter, 2009 Endangerment Finding].

[61] *Coal. for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102 (D.C. Cir. 2012), *aff'd in part, rev'd in part sub nom. Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427 (2014), *on remand*, 606 Fed. App'x 6 (D.C. Cir. 2015), *cert. denied sub nom. Energy-Intensive Mfrs. Working Grp. on Greenhouse Gas Regulation v. EPA*, 136 S. Ct. 900 (2016).

[62] Donald J. Wuebbles et al., *Climate Science Special Report: Fourth National Climate Assessment, Vol. I*, U.S. GLOBAL CHANGE RESEARCH PROGRAM (2017), *available at* https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf.

[63] The sector accounted for 29% of U.S. GHG emissions in 2015. *See* Envtl. Prot. Agency, Sources of Greenhouse Gas Emissions, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions (last visited June 14, 2018).

Accordingly, even though reversing the Endangerment Finding could have a decisive impact on authorities to regulate GHG emissions under the Clean Air Act, it would be very unlikely to survive legal scrutiny, even under a deferential standard of review.

### Key Findings

If the Trump EPA repeals the Clean Power Plan, there is a significant risk that its repeal will not survive judicial review, which would leave the rule in effect. This risk is lowest if the Trump EPA follows through on a repeal-and-replace approach; however, even this approach is vulnerable. The risk is highest if the Trump EPA attempts to repeal the Clean Power Plan on the basis of the Section 112 Exclusion or on the basis of a repeal of the 2009 Endangerment Finding.

### C. A Future Administration Could Adopt a Different Section 111 Approach than the Trump EPA.

Even if the Trump EPA repealed the Clean Power Plan, or replaced it with a more lenient standard, and even if its rulemaking actions survived judicial review, there is a risk that the Trump EPA would not fully close the door to promulgation of a stringent Section 111(d) rule by a successor EPA.

Below is an analysis of this risk under each of the three scenarios outlined above.

***Scenario 1: Repealing the Clean Power Plan and Replacing It with Section 111(d) Standards Based on Inside-the-Fence Measures.*** Under this scenario, as discussed above, the Trump EPA would finalize something like its Proposed Affordable Clean Energy Rule, which establishes standards of performance for coal-fired power plants based on a particular set of inside-the-fence measures: heat rate improvements. This scenario leaves open two pathways for action by a future administration.

First, a future administration might retain the view that only inside-the-fence measures may be considered in determining the "best system of emission reduction" but revisit the particular measures considered by the Trump EPA. For example, a future EPA could determine that the "best system of emission reduction" includes the potential for existing coal-fired power plants to co-fire with natural gas, implement carbon capture and sequestration, or implement other, more ambitious and potentially costly inside-the-fence measures.

This approach could present significant risk for the power sector if the future administration retained the Trump EPA's view that state compliance plans cannot provide

for emissions trading or averaging. In effect, the power sector would be faced with a very costly command-and-control program.

Alternatively, a future administration might revisit the "inside-the-fence" interpretation, and come forward with a new interpretation that accommodates "outside-the-fence" measures. As discussed above, if the reviewing court had applied a *Chevron* Step Two analysis to the Trump EPA's interpretation, and held that the Trump EPA's interpretation was a reasonable interpretation but not the *only* reasonable interpretation, then this pathway could remain open to a future EPA.

It is worth noting that a future EPA seeking to modify the Trump EPA's rule would have to contend with certain arguments that Section 111(d) only authorizes EPA to promulgate one set of standards for a category of sources and precludes later revisions to that standard.[64] These "one-and-done" arguments point to the fact that other provisions in the Clean Air Act explicitly direct EPA to review, and as necessary revise, promulgated standards in set intervals. The absence of such a review-and-revise requirement in Section 111(d), so the argument goes, means that Congress intended a "one-and-done" approach for Section 111(d).[65] However, a future EPA would have arguments against this interpretation. The future EPA might argue that it is not reasonable to interpret Congressional silence about revision of Section 111(d) standards as a Congressional prohibition against such revisions. For example, the Obama EPA argued that the one-and-done interpretation would be unreasonable because it would mean that Congress intended to allow existing sources to operate in perpetuity without any consideration of the need for updated controls, merely because EPA once established standards for them; this approach would seem to be inconsistent with a mandate for determining the "best" system of emission reduction. Furthermore, absent an explicit prohibition on revisions, there would not be a basis for assuming Congress meant to contradict the basic administrative law principle that agencies may update their rules in light of new conditions.[66] The Obama EPA also argued that such an interpretation would be inconsistent with the overall purposes of

[64] There is some question whether these arguments only constrain the ability of an agency to modify a Section 111(d) rule, not the ability to repeal such a rule.

[65] Comments of the Utility Air Regulatory Group on EPA's Proposed "Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills" at 2-4, Docket ID No. EPA-HQ-OAR-2014-0451 (Oct. 26, 2015) (asserting that Congress intended to preclude revision of section 111(d) emission guidelines because the provision is silent on revisions while section 111(b) explicitly mandates that EPA review and, if appropriate, revise standards for new and modified sources).

[66] *See Am. Trucking Ass'ns, Inc. v. Atchison, Topeka & Santa Fe Ry. Co.*, 387 U.S. 397, 416 (1967) ("[T]his kind of flexibility and adaptability to changing needs and patterns of transportation is an essential part of the office of a regulatory agency. Regulatory agencies do not establish rules of conduct to last forever; they are supposed, within the limits of the law and of fair and prudent administration, to adapt their rules and practices to the Nation's needs in a volatile, changing economy. They are neither required nor supposed to regulate the present and the future within the inflexible limits of yesterday.").

the Clean Air Act to protect and enhance air quality.[67] Finally, a future EPA likely would point to the Trump EPA's action of replacing the Clean Power Plan with the Affordable Clean Energy Rule—without any court mandate to do so—as itself an example of an agency-implemented revision.

***Scenario 2: Section 112 Exclusion.*** The outcome under this scenario could depend on the standard of review adopted by the judicial branch. If the reviewing court concluded that the issue was not delegated to the EPA to determine, but rather solely for the court to interpret under a *Chevron* Step Zero standard of review, then a decision affirming the Section 112 Exclusion interpretation could close the door on any regulation of $CO_2$ emissions of existing coal-fired power plants under Section 111(d) so long as such plants remain subject to regulation under Section 112. In effect, the court's decision would conclude there is only one permissible interpretation of this issue, and the interpretation forecloses Section 111(d) regulation of coal-fired power plants because of the Section 112 MATS Rule. Even under this scenario, a future EPA might adopt a sequencing strategy, *i.e.*, repeal the MATS Rule, promulgate $CO_2$ limits under Section 111(d), and then promulgate a new toxics rule under Section 112—thus, underscoring the legal challenge of reliance on the Section 112 Exclusion.

On the other hand, if the reviewing court were to conclude that the issue calls for interpretation by the EPA, then the more deferential standard of review would apply. In this latter case, a future EPA might abandon the Trump EPA's interpretation and proffer an alternative interpretation under which regulatory authority would become available again. In this scenario, there is a possibility that a reviewing court could determine that the successor EPA's alternative interpretation of under Section 111(d) is also permissible, thereby clearing the path for new regulation of fossil-fired plants under that provision.

***Scenario 3: Reversal of the Endangerment Finding.*** As discussed above, the Trump EPA would have to clear a high bar to defend reversing the 2009 Endangerment Finding. Nonetheless, even if it prevailed, it would be possible for a future administration to re-examine the state of science—which, as noted above, is increasingly robust—and make a new endangerment finding.

For these reasons, even if the Trump EPA repeals or replaces the Clean Power Plan, and its rulemaking action is upheld by reviewing courts, a future EPA might still have the authority to impose a more stringent Section 111(d) regulation on existing power plants.

[67] Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, 81 Fed. Reg. 59,276, 59,277-78 (Aug. 29, 2016).

### Key Findings

Even if the Trump EPA's rulemaking action to repeal the Clean Power Plan survives judicial review, there is a significant risk that a future EPA will be able to promulgate a new, stringent Section 111(d) rule limiting $CO_2$ emissions from power plants.

## D. A Future EPA Could Impose GHG Regulations Under Another Section of the Clean Air Act.

Regardless of how the Trump EPA's actions with respect to the Clean Power Plan fare in the courts, a future EPA might take steps to regulate existing power plants under another provision of the Clean Air Act. In other words, assuming that in the next 10 years, a President who is motivated to address climate change takes office, that President is likely to find pathways for GHG regulation still available.

This prospect would remain for two reasons. First, as explained above, it is very unlikely that the Trump EPA could successfully reverse the 2009 Endangerment Finding, or foreclose a similar finding in the future. The Endangerment Finding establishes a predicate for Clean Air Act regulation of major sources of GHG emissions; and, as discussed below, there are arguments that it even establishes a mandate for such regulation.[68] Therefore, EPA might have a statutory duty to regulate under another pathway under any of the scenarios for the Clean Power Plan described above.

And other potential Clean Air Act pathways exist. Indeed, a future EPA might opt for one of these other pathways even in a scenario in which the Trump EPA finalized a Section 111(d) standard. The future EPA might reverse that rule and pursue more stringent regulation under one or more of these alternative pathways.[69]

To be sure, there are legal arguments against the availability of these other pathways. And there is a case to be made that these alternative pathways may not yield optimal climate

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[68] *See, e.g.,* Order, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Aug. 8, 2017) (Tatel, Millet concurrence) ("[The 2009 Endangerment Finding] triggered an affirmative statutory obligation to regulate greenhouse gases") (citing *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007)).

[69] If a future EPA sought to regulate power plant $CO_2$ emissions pursuant to a Clean Air Act provision other than Section 111(d), it might first need to eliminate the Trump EPA's Clean Power Plan replacement rule. For reasons outlined above in the discussion of the "Section 112 Exclusion," if EPA determined that $CO_2$ was a criteria pollutant under Section 108 or a toxic pollutant under Section 112, it likely would be barred from *also* regulating power plant $CO_2$ emissions under Section 111(d). Therefore, before regulating power plant $CO_2$ emissions under another Clean Air Act pathway, EPA probably would have to undo any existing Section 111(d) regulation. *But see* Kassie Siegel et al., *Strong Law, Timid Implementation – How the EPA Can Apply the Full Force of the Clean Air Act to Address the Climate Crisis*, 30 UCLA J. OF ENVTL L. & POL'Y, 185, 215 (2012) (arguing that the Clean Air Act does not clearly require the cancellation of a Section 111(d) regulation that was promulgated *before* the designation of the relevant pollutant as a criteria pollutant under Section 108).

policies. However, the other pathways are plausible, and therefore meet the risk criterion of this White Paper.

### *1. Sections 108-110: National Ambient Air Quality Standards*

In the event that rulemaking actions by the Trump EPA foreclose or narrow the agency's Section 111 authority to regulate power plant $CO_2$ emissions, a future EPA could seek to limit such emissions by promulgating National Ambient Air Quality Standards (NAAQS) for GHGs under Sections 108 through Section 110 of the Clean Air Act. In their traditional form, NAAQS specify the maximum permissible level of an air pollutant in the ambient air. Implementation is on a state-by-state basis.

As explained below, it is possible that NGOs or states would petition EPA to regulate under Sections 108-110 and a court would hold that such regulation is mandatory. Indeed, one such petition was filed in 2009.[70] Alternatively, a future EPA might pursue such regulation on its own volition.

The EPA has contemplated the NAAQS pathway before. Under the George H.W. Bush Administration, the EPA issued an Advance Notice of Proposed Rulemaking (ANPR) that discussed and solicited public comment on different pathways under the Clean Air Act for regulation of GHGs—albeit without reaching conclusions about the legal validity of any of those pathways.[71] The ANPR identified NAAQS-based regulation as one of the potential pathways for regulations.[72] In addition, a number of legal scholars have asserted that NAAQS provide a legally viable mechanism for regulation of GHGs.[73]

Section 108 mandates that EPA identify as "criteria" air pollutants any air pollutant:

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[70] Center for Biological Diversity and 350.org, *Petition to Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act* (Dec. 2, 2009), *available at* http://www.biologicaldiversity.org/programs/climate_law_institute/global_warming_litigation/clean_air_act/pdfs/Petition_GHG_pollution_cap_12-2-2009.pdf.

[71] Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354 (July 30, 2008) [hereinafter, 2008 GHG ANPR].

[72] *Id.* at 44,477-86.

[73] *See, e.g.*, Inimai M. Chettiar et al., *The Road Ahead: EPA's Options and Obligations for Regulating Greenhouse Gases*, NYU INST. FOR POL'Y INTEGRITY (2009); Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ L. REV. 799 (2008); Ari R. Lieberman, *Turning Lemons into Lemonade: Utilizing the NAAQS Provisions of the Clean Air Act to Comprehensively Address Climate Change*, 21 BUFF. ENVTL. L. J. 1 (2013); Patricia Ross McCubbin, *EPA's Endangerment Finding for Greenhouse Gases and the Potential Duty to Adopt National Ambient Quality Standards to Address Global Climate Change*, 33 S. ILL. U. L. J. 437 (2009); Timothy J. Mullins & M. Rhead Enion, *(If) Things Fall Apart: Searching for Optimal Regulatory Solutions to Combating Climate Change under Title I of the Existing CAA If Congressional Action Fails*, 40 ENVTL. L. REP. 10864 (2010); Rich Raiders, *How EPA Could Implement a Greenhouse Gas NAAQS*, 22 FORDHAM ENVTL. L. REV. 233 (2011); Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does Chevron Set the EPA Free?*, 29 STAN. ENVTL. L. J. 283 (2010); Nathan Richardson et al., *Greenhouse Gas Regulation under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ENVTL L. REP. 10098 (2011); Siegel, *supra* note 69.

> (1) "emissions of which, in [the EPA's] judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare"; (2) "the presence of which in the ambient air results from numerous or diverse mobile or stationary sources"; and (3) "for which [the Administrator] plans to issue air quality criteria under this section."[74]

There is a strong argument that the 2009 Endangerment Finding satisfies the first of these tests. With respect to the second test, there is no question that at least $CO_2$ is emitted by numerous sources, including not only power plants but also vehicles and factories.

There is more uncertainty around the third test. Some caselaw suggests that if the first two tests are satisfied, EPA is *required* to establish a NAAQS for the pollutant.[75] The 2009 petition to EPA made this argument.[76] On the other hand, others have asserted that the relevant caselaw is no longer controlling and that listing a pollutant remains at the discretion of the agency.[77] To date, the original 2009 petitioner has not pressed its petition, so the question has not come before a court. Accordingly, there still remains a risk that a court could find that the law requires EPA to list $CO_2$ as a "criteria" pollutant and then promulgate a $CO_2$ NAAQS.

In any event, even without a mandate, it is conceivable that a future EPA could decide on its own to list $CO_2$ as a criteria pollutant (possibly with other GHGs), particularly if the Trump EPA takes actions that foreclose or narrow the agency's authority to regulate power plants or other major sources of $CO_2$ under Section 111.

In the past, EPA has established both "primary" and "secondary" NAAQS for criteria pollutants. The Clean Air Act requires a "primary" NAAQS to be set at a level that is requisite to protect the public health, "allowing an adequate margin of safety."[78] The agency also sometimes establishes a different "secondary" NAAQS to "protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air."[79] "Public welfare" is defined to include effects on water, crops, weather, and economic values.[80] The agency is not permitted to take compliance costs into account in setting a NAAQS.[81]

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[74] CAA § 108(a)(1).
[75] *Natural Res. Def. Council, Inc. v. Train*, 545 F.2d 320, 328 (2d Cir. 1976).
[76] Center for Biological Diversity and 350.org, *supra* note 70, at 15.
[77] *See, e.g.,* Nathan Richardson, *Greenhouse Gas Regulation under the Clean Air Act: Does* Chevron v. NRDC *Set the EPA Free?*, 29 STAN. ENVTL. L.J. 283 (2010).
[78] CAA § 109(b).
[79] *Id.* § 109(b)(2).
[80] *Id.* § 302(h).
[81] *Whitman v. Am. Trucking Ass'ns., Inc.*, 531 U.S. 457 (2001).

If EPA established a $CO_2$ NAAQS, Section 110 of the Clean Air Act would require the agency to designate areas throughout the country as "attainment," "nonattainment," or "unclassifiable" with respect to the standards.[82] Each state would then be required to adopt and submit to EPA a plan for meeting the NAAQS in each of its designated areas. Each state also has a "Good Neighbor" obligation to ensure that its emissions do not complicate attainment by other states.[83]

Though states are afforded flexibility in developing these "State Implementation Plans" (SIPs), the plans must comply with multiple statutory requirements aimed at ensuring that major sources of the relevant pollutant are subject to control requirements.

"Nonattainment" areas are subject to particularly stringent, source-specific requirements.[84] Because fossil-fired power plants account for 35% of U.S. $CO_2$ emissions (and 29% of GHG emissions), such facilities would almost certainly be a primary focus of SIPs.[85] Nonetheless, some legal scholars have asserted that, relative to Section 111, a NAAQS-based pathway for $CO_2$ regulation might offer more compliance flexibility. They assert that, unlike the sector-specific focus of Section 111, Section 110 could more easily accommodate a national, multi-sector cap-and-trade program.[86] Section 110 explicitly authorizes SIPs to include "economic incentives such as fees, marketable permits, and auctions of emissions rights."[87]

### Duke Energy

Duke Energy is an investor-owned utility that owns 49,000 MW of power generation, which serves customers across six states. In 2017, the company set a goal to reduce its $CO_2$ emissions 40% from 2005 levels by 2030. The company has reduced its emissions by 31% since 2005. To meets its carbon goals, Duke Energy announced plans in 2018 to retire nine coal-fired generating units (2000+ MW of capacity) by 2024 and invest $11 billion in new natural-gas fired, wind, and solar capacity through 2026.

While future climate policies could create additional compliance costs for Duke Energy, the utility has stated that "they also have the potential to create business opportunities." According to Duke Energy, "the utility industry is well positioned to facilitate emissions reductions from the transportation sector." Currently, the utility is building out electric vehicle infrastructure in its service territory.

For more information, see:
Duke Energy, 2017 Climate Report to Shareholders (2017), *available at* https://www.duke-energy.com/_/media/pdfs/our-company/shareholder-climate-report.pdf
Duke Energy EEI ESG/Sustainability Reporting (Aug. 2018), *available at* https://www.duke-energy.com/_/media/pdfs/our-company/duke-energy-eei-esg-sustainability-reporting-pilot.pdf

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[82] CAA § 107(d).
[83] *Id.* § 110(a)(2)(D). Note that the Section 111(d), the source of the authority of the Clean Power Plan, directs EPA to establish a procedure "similar to that provided by [Section 110]" under which states develop plans and submit them to EPA for approval.
[84] *Id.* §§ 171-79B.
[85] EIA, Frequently Asked Questions, https://www.eia.gov/tools/faqs/faq.php?id=77&t=11 (last visited June 29, 2018).
[86] *See, e.g.,* Christina Reichert et al., *Revisiting the NAAQS Program for Regulating Greenhouse Gas Emissions under the Clean Air Act* at 19, DUKE U. NICHOLAS INST. FOR ENVTL. POL'Y SOLUTIONS, Working Paper NI WP 17-01 (Jan. 2017), *available at* https://nicholasinstitute.duke.edu/sites/default/files/publications/ni_wp_17-01.pdf.
[87] 42 U.S.C. § 110(a)(2)(A).

Were a future EPA to opt for the NAAQS pathway, it would need to address significant legal and policy design issues, including the level at which to set primary and secondary NAAQS and how to handle permitting of smaller facilities. Nevertheless, it is far from clear that these design issues are so significant that a reviewing court would find that promulgating a $CO_2$ NAAQS exceeds EPA's authority—particularly since the NAAQS program is the primary mechanism for regulating pollutants under the Clean Air Act, and the Supreme Court has already held that $CO_2$ is a "pollutant" in the meaning of the statute.[88] Indeed, as explained above, it is even possible that a court will hold that EPA is required to promulgate such a NAAQS based on the 2009 Endangerment Finding. Therefore, there is a credible risk that power plants could become subject to NAAQS-based regulation of their $CO_2$ emissions.

### *2. Section 115*

Section 115 of the Clean Air Act, which addresses "International Air Pollution," provides another potential pathway for regulation of power plant $CO_2$ emissions. As with the NAAQS pathway, the Bush EPA identified Section 115 as a potential mechanism for GHG regulation in its 2008 GHG ANPR, even though it did not reach definitive conclusions about its legal validity.[89] A significant number of environmental law scholars have argued that Section 115 is a legal, and even optimal, pathway for GHG regulation.[90] In 2013, the Institute for Policy Integrity petitioned EPA to regulate GHGs under Section 115; the agency has never responded to this petition.[91]

Section 115 authorizes EPA to require states to revise their Section 110 SIPs to address the adverse impacts of their emissions of pollutants on other countries. EPA may invoke this authority only if it makes two findings. The first is a variant of the "endangerment" finding familiar from other sections of the Clean Air Act. Specifically, EPA must have reason to believe based on reports from any "duly constituted international agency" that "any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may be reasonably be anticipated to endanger public health or welfare in a foreign country."[92]

The second trigger for EPA's Section 115 authority is a "reciprocity" determination. EPA may only apply its Section 115 authority with respect to a foreign country if EPA

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[88] *See Massachusetts v. EPA*, 549 U.S. 497.
[89] 2008 GHG ANPR, *supra* note 71, at 44,482.
[90] Michael Burger et al., *Legal Pathways to Reducing Greenhouse Gas Emissions Under Section 115 of the Clean Air Act*, 28 GEORGETOWN ENVTL L. R. 359 (2016), *available at* http://columbiaclimatelaw.com/files/2016/09/Burger-et-al-2016-06-Legal-Pathways-to-Reducing-GHGs-Under-CAA-Section-115.pdf.
[91] Institute for Policy Integrity, *Petition for Rulemakings and Call for Information Under Section 115, Title VI, Section 111, and Title II of the Clean Air Act to Regulate Greenhouse Gas Emissions* (Feb. 19, 2013), *available at* http://policyintegrity.org/documents/Policy%20Integrity%20Omnibus%20GHG%20Petition%20under%20CAA.pdf.
[92] CAA § 115(a). Alternatively, the Secretary of State may request an endangerment finding from EPA.

determines that the other country has "given the United States essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by this action."[93]

Legal scholars advocating the use of Section 115 authority assert that the findings of the Intergovernmental Panel on Climate Change, among other international bodies, satisfy the first condition. They further argue that the United Nations Framework Convention on Climate Change, as supplemented by the 2016 Paris Climate Agreement, satisfies the second condition.[94] In particular, they emphasize that this web of agreements includes both an "enhanced transparency framework" allowing countries to comment on each other's actions (a form of "procedural" reciprocity) and significant mitigation pledges by nearly 190 countries (a form of "substantive" reciprocity).[95] Thus, they assert that EPA may use its Section 115 authority.

If EPA were to regulate under Section 115, it would likely establish limits on $CO_2$ or GHG emissions on a state-by-state basis.[96] Then, states would submit SIPs (or revised SIPs) with measures to achieve the limits. Section 115 does not provide any detail on what states may or may not do; however the reference to the SIP revision provisions of Section 110 arguably provides states with the same comprehensive and flexible authority to regulate air pollution as they have for criteria pollutants. This would include authorities to develop traditional command-and-control emission limits, as well as "economic incentives such as fees, marketable permits, and auctions of emissions rights."[97]

One of the most contested and uncertain legal issues regarding EPA's authority under Section 115 is whether it may only be used to regulate "criteria" pollutants. The question arises because Section 115 refers to revision of a Section 110 plan, and, as discussed above, Section 110 plans typically address criteria pollutants.[98] Because GHGs have not been

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[93] *Id.* § 115(c).

[94] Burger et al. also make the case the condition could be satisfied by a lesser number of countries that have made domestic reduction commitments; they note, for example, that the combined GHG emissions of the European Union, Canada, and Mexico in 2011 nearly equaled the level of U.S. emissions. Burger et al., *supra* note 90, at 377.

[95] *Id.* at 378-92.

[96] Under the structure of Section 115, the endangerment "finding" is a determination that a state's SIP is inadequate and the remedy is a directive to the state to revise its SIP to prevent or eliminate the endangerment. CAA § 115(b). Note that, under this structure, the limits would be on emissions (not concentrations as under the NAAQS provisions) and the limits would apply on a state-by-state basis (rather than to particular sectors as under Section 111).

[97] *Id.* § 110(a)(2)(A).

[98] *See id.* § 110(a)(1) (requiring the submission of a SIP "after the promulgation of a [NAAQS] (or any revision thereof) . . . any air pollutant, . . . which provides for implementation, maintenance, and enforcement of such primary standard in each air quality control region (or portion thereof) within such State"); *but see id.* § 110(k)(5) (permitting EPA to require plan revisions upon a finding that a SIP is inadequate to "otherwise comply with any requirement of this chapter"); *id.* § 110(a)(2)(D)(ii) (requiring SIPs to "insur[e] compliance with the applicable requirements of" section 115.)

listed as criteria pollutants under Section 108, the resolution of this question is critical in determining EPA's authority to use this section for GHGs. In two separate actions in 2008, EPA interpreted Section 115 to apply only to criteria pollutants because of the cross-reference to Section 110 SIPs, which typically address criteria pollutants and attainment of NAAQS.[99] However, others dispute this interpretation. They point out that there is no explicit provision in Section 115 limiting its application to criteria pollutants; indeed, the plain language refers to "any air pollutant."[100] In any event, Section 110 plans now address GHGs because GHGs are regulated as part of the Prevention of Significant Deterioration program.[101]

Nevertheless, because of this uncertainty, a future EPA might first list GHGs as criteria air pollutants, establish one or more NAAQS for GHGs, and then use Section 115 to require states to develop GHG SIPs that take into account the extent to which emissions from sources in their state contribute to international air pollution.

EPA would need to make other complicated determinations to move forward with Section 115 regulations. For example, the agency would have to determine what level of emissions would be sufficient to prevent or eliminate the international endangerment caused by individual states. Section 115 does not include an explicit procedure to guide such determinations, including whether and how costs and technical feasibility factor into this assessment.

#### *3. Other Pathways for Clean Air Act Regulation*

In addition to Sections 108-110 and Section 115, there are other potential pathways for regulating GHGs under the Clean Air Act. These other pathways present higher legal hurdles for implementation by EPA, and therefore are less likely to be deployed by a future administration.

##### a) Section 112

As discussed above, Section 112 of the Clean Air Act outlines EPA's authorities to regulate sources of hazardous air pollutants. Traditionally, EPA has utilized its Section 112 authority only to address highly toxic pollutants, including pollutants that present dangers

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[99] Letter from Brian McLean, Dir., Office of Atmospheric Programs, U.S. Environmental Protection Agency, to Albert Koehl, Staff Attorney, Ecojustice Canada (Feb. 29, 2008) (rejecting a petition requesting that EPA use Section 115 to regulate GHGs); 2008 GHG ANPR, *supra* note 71, at 44,483 ("Section 115 could not be used to require states to incorporate into their SIPs measures unrelated to attainment or maintenance of a NAAQS").
[100] *See generally* Hannah Chang, *Cap-and-Trade Under the Clean Air Act?: Rethinking Section 115*, 40 ENVTL. L. REP. 10894 (2010); Roger Martella & Matthew Paulson, *Regulation of Greenhouse Gases Under Section 115 of the Clean Air Act at 5*, DAILY ENV'T REP. (BNA) No. 43 (Mar. 9, 2009); Burger et al., *supra* note 90, at 393-97.
[101] Burger et al., *supra* note 90, at 394 (citing Action to Ensure Authority to Issue Permits Under the Prevention of Significant Deterioration Program to Sources of Greenhouse Gas Emissions: Finding of Substantial Inadequacy and SIP Call, 75 Fed. Reg. 77,698 (Dec. 13, 2010)).

to human health from inhalation. Nonetheless, some legal scholars[102] – and EPA's 2008 GHG ANPR[103] – have identified Section 112 as a potential pathway for GHG regulation.

If applied to GHGs, Section 112 could yield a regulatory program with very onerous administrative and compliance burdens. Given the legal and implementation obstacles, the probability of Section 112 regulation of GHGs is low, but if such regulation were adopted the impacts on fossil-fired power plants would be very substantial. Therefore, Section 112 regulation meets the risk criteria of this White Paper.

Some legal scholars have argued that GHGs can meet the statutory criteria for being a hazardous air pollutant. Congress added Section 112 to the Clean Air Act in 1990 and established an initial list of 183 hazardous air pollutants.[104] Congress directed EPA to periodically review and revise this list by adding pollutants that present a threat of: (1) adverse human health effects, including through inhalation or "other routes of exposure"; or (2) "adverse environmental effects" including through "ambient concentrations."[105] Though EPA traditionally has applied its Section 112 authority to toxic pollutants, there is an argument that the plain language of this definition – particularly the second prong – is broad enough to encompass GHGs.

If a future EPA were to list GHGs as hazardous air pollutants, the agency would be required to establish stringent limits for a broad range of facilities. Specifically, EPA would be required to promulgate National Emission Standards for Hazardous Air Pollutants (NESHAPs) for GHGs for "major sources."[106] The statute directs EPA to establish a NESHAP based on reductions achievable through application of the "Maximum Achievable Control Technology" (MACT).[107] MACT is a very strict, technology-based standard; it is supposed to correspond to the performance of the lowest-emitting 12% of sources in the relevant source category.[108] Furthermore, existing sources subject to a NESHAP must achieve compliance with the MACT on an expedited timetable; compliance is generally required within three years of the date that the NESHAP takes effect, with limited authority for

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[102] Daniel Brian, *Regulating Carbon Dioxide Under the Clean Air Act As A Hazardous Air Pollutant*, 33 COLUM. J. ENVTL. L. 369, 370 (2008); Mark Bond, *Can and Should Greenhouse Gases be Regulated as Hazardous Air Pollutants Under Clean Air Act Sect. 112?*, COLUM. L. SCH. SABIN CTR. FOR CLIMATE CHANGE L. (2015) (student paper), *available at* https://web.law.columbia.edu/sites/default/files/microsites/climate-change/bond_-_ghgs_regulated_as_haps.pdf.

[103] 2008 GHG ANPR, *supra* note 71, at 44,493-95.

[104] CAA § 112(b)(1).

[105] *Id.* § 112(b)(2). Section 112(a)(7) defines "adverse environmental effect" as "any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas."

[106] *Id.* § 112(d)(1).

[107] *Id.* § 112(d)(2).

[108] *Id.* § 112(d)(3).

extensions.[109] In addition, Section 112 arguably does not allow for compliance flexibility, such as through emissions trading.

If a future EPA were to list GHGs as hazardous air pollutants, it would be required to regulate not just power plants, but many other facilities. As discussed above, EPA would be required to regulate all "major sources"; Section 112 defines a "major source" as any facility in a group of categories that emits more than 10 tons per year of any hazardous air pollutant, or 25 tons per year of a combination of hazardous air pollutants.[110] For conventional toxic pollutants, those thresholds likely distinguish significant emitters. For $CO_2$, on the other hand, the thresholds would sweep in countless numbers of relatively small facilities across multiple industries. Without some kind of modifications, a GHG NESHAPS program could be impossible to administer.

In this way, the NESHAP pathway resembles the situation that the Obama EPA confronted in its rules addressing GHGs under the Clean Air Act's Prevention of Significant Deterioration permitting program. The Supreme Court rejected the Obama EPA's attempt to modify its obligations (referred to as the "Tailoring Rule") but ultimately interpreted the relevant provisions in a way that avoided impossible results.[111] There is a question about whether a similar accommodation would be available under Section 112 or whether other interpretations are possible that would mitigate what would otherwise be a grossly unworkable outcome for both regulators and regulated entities.[112]

Given the legal questions surrounding whether GHGs could be listed as "hazardous air pollutants" and the implications of imposing NESHAPS on countless small facilities, the likelihood of a future EPA employing Section 112 to regulate power plant $CO_2$ emissions is very low. On the other hand, because of the stringency and inflexibility of the MACT standard, if EPA were to pursue such a pathway, the consequences for power plants could be very substantial. Accordingly, implementation of the Section 112 pathway is an example of the kind of low-probability/high-consequence approach that amounts to a noteworthy risk.[113]

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[109] *Id.* § 112(i)(3)(A) (requiring compliance within three years of the effective date of a standard subject to certain enumerated exceptions); *id.* § 112(i)(3)(B) (authorizing issuance of a permit that grants a one-year compliance extension if "necessary for the installation of controls"); *id.* § 112(i)(4) (authorizing the President to exempt a source from compliance for up to two years for "national security" reasons).
[110] *Id.* § 112(a)(1).
[111] *See Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427.
[112] Bond, *supra* note 102, at 11-14.
[113] Martella & Paulson, *supra* note 100, at 5 ("[I] t is not beyond the realm of possibility that regulators will give Section 112 further consideration.").

### b) Section 615

Another alternative pathway would be for EPA to regulate power plants and other sources of GHG emissions under Title VI of the Clean Air Act, and specifically under Section 615. The Bush EPA discussed Section 615 as a possible GHG regulatory option in its 2008 GHG ANPR without reaching a conclusion about its legal validity.[114] The Institute for Policy Integrity's 2013 petition for rulemaking to EPA invoked not only Section 115 but also Section 615. However, as discussed below, a recent court decision held that EPA cannot use its Title VI authorities to regulate substances for their impacts on climate change, thereby making the use of Section 615 a more remote risk than the risk associated with other regulatory pathways.

As with other provisions in the Clean Air Act, the authority to use Section 615 rests on an "endangerment" finding. However, the finding required under Section 615 turns on effects on the stratosphere. Section 615 states:

> If, in the Administrator's judgment, any substance, practice, process, or activity *may reasonably be anticipated to affect the stratosphere*, especially ozone in the stratosphere, *and such effect may reasonably be anticipated to endanger public health or welfare*, the Administrator *shall* promptly promulgate regulations respecting the control of such substance, practice, process, or activity, and shall submit notice of the proposal and promulgation of such regulation to the Congress.[115]

Congress added Section 615 to the Clean Air Act after the United States becoming a party to a series of treaties to control substances that deplete stratospheric ozone. Accordingly, there is a question as to whether the agency's scope of authority under Section 615 is limited to regulation of ozone-depleting substances (ODS), or whether it extends more broadly to regulation of GHGs if the agency finds that GHGs interact in some way with the stratosphere.

A recent decision of the D.C. Circuit addressed this issue; it held that EPA's Title VI authority is confined to controlling ozone-depleting substances and does not extend to GHGs.[116] The decision addressed the validity of a 2015 regulation promulgated by the Obama EPA under Section 612, which prescribes EPA's authority to require manufacturers to replace ozone-depleting substances with safe substitutes.[117] Previously, EPA had

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[114] 2008 GHG ANPR, *supra* note 71, at 44,519.
[115] CAA § 615 (emphasis added).
[116] *Mexichem Fluor, Inc. v. EPA*, 866 F.3d 451 (D.C. Cir. 2017), *reh'g en banc denied*, No. 15-1328 (D.C. Cir. Jan. 26, 2018), *cert. denied sub nom. Honeywell Int'l Inc. v. Mexichem Fluor Inc.*, No. 17-1703, 2018 WL 3127416 (U.S. Oct. 9, 2018).
[117] Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program, 80 Fed. Reg. 42,870 (July 20, 2015).

identified hydrofluorocarbons (HFCs) as a safe replacement for ODS. Subsequently, in the 2009 Endangerment Finding, EPA identified HFCs as potent GHGs.[118] On this basis, the Obama EPA promulgated the 2015 rule requiring HFC manufacturers to replace HFCs with other, more climate-friendly substances.

In a 2-1 decision, the court held that the rule exceeded EPA's authority under Section 612. The majority opinion emphasizes that Section 612 does not permit EPA to "order the replacement of substances that are not ozone depleting but that contribute to climate change."[119]

In light of the decision of the D.C. Circuit, the likelihood that a future EPA Section 615 to regulate power plant carbon dioxide emissions is more remote than other pathways discussed above.

### Key Findings

Even if the Trump EPA were to finalize rulemakings actions that raised hurdles to future EPA action under Section 111(d), there is a risk that a future EPA could use other authorities under other sections of the Clean Air Act to promulgate GHG regulations affecting power plants. Legal scholars, and EPA itself, have identified a range of potential regulatory pathways available under the Clean Air Act.

## E. Future Federal Climate Regulations Affecting the Power Sector Could be Stringent

As explained above, there are multiple potential pathways that a future EPA could use to regulate power plant $CO_2$ emissions. The precise form and numerical stringency of such possible future regulation is unknown. However, assuming a future President is motivated to adopt climate change policies, there are reasons to believe that that President will opt for stringent controls on the U.S. power sector, regardless of the particular policy pathway. In particular, there is a significant possibility that any future GHG regulation of the power sector could exceed the ambition of even the second, more stringent phase of the Clean Power Plan.

The policy preferences of a future administration will be formed in the face of increasing scientific evidence that human activities are changing the climate and that climate change will have dramatic impacts. These scientific findings could drive policymakers in the

[118] 2009 Endangerment Finding, *supra* note 60.
[119] *Mexichem Fluor, Inc. v. EPA*, 866 F.3d at 460.

direction of stringent limits on the power sector. In addition, a future administration may conclude that it needs to make up for lost ground under the Trump Administration, resulting in a kind of "pendulum" risk for the power sector.[120]

One could expect very stringent power plant regulations if a future administration adopted—whether as a matter of policy or as an international legal commitment—the objective of reducing U.S. GHG emissions to 80% below 2005 levels by 2050. The Obama Administration used this benchmark when it published a "Mid-Century Strategy for Deep Decarbonization" in November 2016.[121] Though the Mid-Century Strategy document modeled multiple scenarios for reaching the 80% reduction objective, it is noteworthy that each of the scenarios contemplates the near complete de-carbonization of the power sector by 2050.[122] In other words, in these scenarios, any remaining fossil generation is coupled with CCUS. The Mid-Century Strategy states that the "vast majority of fossil fuel electricity generation without CCUS is phased out by mid-century."[123]

**DTE Energy**

DTE Energy is an investor-owned utility that owns 12,466 MW of power generation in Michigan. The company analyzed scenarios for reducing its emissions that would be consistent with policies seeking to avoid more than a two degrees C increase in global temperatures, also known as a "Two Degrees Scenario Analysis." On the basis of this analysis, DTE Energy announced plans to reduce its $CO_2$ emissions 75% below 2005 levels by 2040 and 80% below 2005 levels by 2050. In 2017, DTE Energy established its carbon reduction plan, which involves 1) retiring all of its coal-fired generating units; 2) building 4,000 MW of renewable generation and 3,500 MW of natural gas generation; and 3) investing in technology to increase energy efficiency and reduce peak demand, while modernizing grid infrastructure.

For more information, see:
DTE Energy, 2018 Environmental, Social, Governance, and Sustainability Report (2018), *available at* https://geq2a4cqgdz35lnem46az2tb-wpengine.netdna-ssl.com/wp-content/uploads/2018/04/ESG_Sustainability_Report.pdf
DTE Energy, A Force For Growth & Prosperity: 2016-2017 Corporate Citizenship Report (2017), *available at* https://geq2a4cqgdz35lnem46az2tb-wpengine.netdna-ssl.com/wp-content/uploads/2018/04/DTE_CCR_PDF_digital-4.pdf

The Mid-Century Strategy contemplates this dramatic decarbonization even though the strategy also contemplates substantial growth of overall electricity generation. By 2050, total electricity generation almost doubles in three of four scenarios modeled.[124] This growth occurs because the scenarios modeled in the Mid-Century Strategy assume not only increased economic activity, but also policies that promote increased electrification to substitute direct use of fossil fuels in the transportation, buildings, and industrial sectors.[125]

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[120] Kyle Danish & Sarah Ladislaw, *Playing the Long Game on Energy: Avoiding Pendulum Politics and Regulatory Risk*, CENTER FOR STRATEGIC & INT'L STUD. (June 7, 2017), *available at* https://www.csis.org/analysis/playing-long-game-energy-avoiding-pendulum-politics-and-regulatory-risk.
[121] The White House, Mid-Century Strategy for Deep Decarbonization (Nov. 2016), *available at* https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf.
[122] *Id.* at 48.
[123] *Id.*
[124] *Id.*
[125] *Id.*

To appreciate the near-term impact of a stringent future regulatory program on the power sector, it is useful to look at the modeling that has been done of possible economy-wide carbon taxes. For example, a study by the U.S. Energy Information Administration found that a tax starting at $25/tCO$_2$e and increasing 5% annually would decrease power sector CO$_2$ emissions by 55% between 2018 and 2030.[126]

Another study looked at the impact of a tax set at $50/tCO$_2$e starting in 2020 and increasing 2% above the rate of inflation annually.[127] The study found that the tax would cause power sector emissions to drop almost immediately and precipitously. Absent the tax, the sector's 2030 emissions would be between 1.4 and 1.8 million metric tons CO$_2$e. With the tax, the sector's 2030 emissions would be between 445 to 675 million metric tons. These decreases correspond to substantial changes in the generation profile of the sector.[128] Even so, the study also cautions that, beyond 2030, such a carbon tax might be insufficient to achieve an economy-wide 80% reduction by 2050, implying that a more aggressive tax or other complementary policies could be necessary.[129]

If a future administration was committed to using something like the 80% reduction objective as the lodestar for its climate policies, it would have to adopt very stringent CO$_2$ limits for the power sector in order to drive emissions onto that trajectory. Based on modeling of carbon taxes, policies of equivalent stringency could have immediate and dramatic impacts on the power sector.

### Key Findings

Assuming a future presidential administration is motivated to promulgate climate policies, there is a risk that the administration will impose CO$_2$ limits on the power sector that are substantially more stringent than the Clean Power Plan—in order to make up lost ground on the road to "deep decarbonization." Such limits could have immediate and dramatic impacts on the composition of the sector.

[126] U.S. Energy Information Administration, Annual Energy Outlook, Side Tables: Nuclear Power Outlook: Table 18, Energy-Related Carbon Dioxide Emissions by Sector and Source: $25 Carbon Allowance Fee (2018), *available at* https://www.eia.gov/outlooks/aeo/tables_side.php.
[127] John Larsen et al., Energy and Environmental Implications of a Carbon Tax in the United States: an Independent Report Prepared by Rhodium Group for Columbia SIPA Center on Global Energy Policy (July 2018), *available at* https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Energy_Environmental_Impacts_CarbonTax_FINAL.pdf.
[128] *Id.* at 16-18.
[129] *Id.* at 31-32.

## II. State and Local Policy Pathways

In addition to the possibility of renewed or expanded regulation at the federal level, power sector entities face the prospect of state and local climate policies. In the near-term, such policies could come from states and cities determined to fill a perceived gap in federal climate policies, which will affect power sector entities that own plants in those jurisdictions. Indeed, power sector entities in such states and cities may find that the policies advanced by committed states and cities will impose more stringent reduction obligations than any requirements the federal government may promulgate.

In November 2017, 15 governors and 455 mayors announced their participation in America's Pledge, an effort to respond to the Trump Administration's stated intention to withdraw the United States from the Paris Climate Agreement by strengthening existing climate policies or establishing new ones.[130]

To date, climate policies have been confined largely to "blue" states such as California and New York. However, a number of "purple" states have taken recent steps to adopt such policies. For example, Virginia has launched a rulemaking to link with the Regional Greenhouse Gas Initiative;[131] the Governor of Colorado issued an executive order to establish a climate action plan and meet the targets in the Paris Climate Agreement;[132] and Illinois has enacted clean energy legislation that is expected to reduce GHG emissions by 56% by 2030.[133] Indeed, expanding the category of relevant state laws to include clean energy policies calls attention to the increasingly ambitious renewable portfolio standards adopted by such "red" states as Nevada, Iowa, and Arizona.[134]

In addition, a large number of U.S. cities are participating in C40 Cities, an alliance of cities throughout the world;[135] C40 Cities has announced an initiative called Deadline 2020,

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[130] America's Pledge, *America's Pledge: Phase 1 Report, States, Cities, and Businesses in the United States Are Stepping Up on Climate Action* (Nov. 2017), *available at* https://www.bbhub.io/dotorg/sites/28/2017/11/AmericasPledgePhaseOneReportWeb.pdf. Signatories to the America's Pledge also included 1,747 businesses and 355 institutions of higher learning.

[131] Robert Zullo, *Virginia State Air Pollution Control Board approves draft rule that would regulate power plant carbon emissions*, RICHMOND TIMES-DISPATCH (Nov. 16, 2017), http://www.richmond.com/news/virginia/virginia-state-air-pollution-control-board-approves-draft-rule-that/article_0b5c9430-050f-5345-a5ad-a444d083a067.html.

[132] State of Colorado, Office of the Governor, Executive Order D 2017-015 (July 11, 2017), *available at* https://www.colorado.gov/governor/sites/default/files/executive_orders/climate_eo.pdf.

[133] Future Energy Jobs Act, SB 2814, 99th Gen. Assembly (Ill. 2016); Andrew Barbeau, *Illinois' Future Energy Jobs Bill Shows States are Taking the Lead to Build the Clean Energy Economy*, ENVTL. DEF. FUND (Dec. 7, 2016), http://blogs.edf.org/energyexchange/2016/12/07/illinois-future-energy-jobs-bill-shows-states-are-taking-the-lead-to-build-the-clean-energy-economy/.

[134] Benjamin Storrow, *New Best Friends, GOP Governors and Renewables*, E&E NEWS (June 23, 2017).

[135] C40 Cities, https://www.c40.org (last visited June 14, 2018).

which is aimed at prioritizing climate mitigation policies at the local level.[136] State and local efforts undertaken through America's Climate Pledge and Deadline 2020 could translate into new mandates requiring power sector entities to reduce their $CO_2$ emissions.

This section identifies the types of state and local climate policies that could emerge from these initiatives.

## A. State-wide and Region-wide Limits on Power Plant Emissions

One possibility for entities in the power sector is that states will expand cap-and-trade programs and other similar policies that impose direct limits on emissions of new, modified, or existing plants.

A cap-and-trade program imposes an overall limit on emitting facilities (the "cap") and distributes rights-to-emit that are equal to the cap ("allowances"). Under such a program, owners of affected facilities must hold allowances to cover all of their emissions, and can buy and sell allowances with other entities. The cost of acquiring scarce allowances creates a market-based incentive to reduce $CO_2$ emissions. Allowance costs reduce the competitiveness of power sector entities with carbon-intensive generation portfolios.

To date, states have created two cap-and-trade programs for GHG emissions and both are on track for significant expansion. One is California's cap-and-trade program, which covers multiple GHGs and multiple economic sectors.[137] In July 2017, the California legislature enacted a law that extends the state's cap-and-trade program through 2030, and requires that emissions be reduced to 40% below 1990 levels by that date; the new target represents a significant increase in stringency.[138]

### Berkshire Hathaway Energy

Berkshire Hathaway Energy is an energy utility holding company that owns 31,853 MW of power generation through multiple utilities, including MidAmerican Energy, NV Energy, and PacifiCorp.

To address its GHG emissions, Berkshire Hathaway Energy pledged in 2015 to: invest an additional $15 billion in renewable energy generation; pursue construction of an additional 552 MW of new wind generation in Iowa; retire 75% of coal-fired generating capacity in Nevada by 2020; add more than 1,000 MW of incremental solar and wind generating capacity to PacifiCorp's portfolio through long-term power purchase agreements; invest in transmission infrastructure upgrades in the West and Midwest; and support the development of markets in the West to improve electric grid efficiency and more effectively integrate renewables.

Since 2005, Berkshire Hathaway Energy has reduced the emissions intensity of its electricity supply by 27 percent, from 0.770 in $MTCO_2$/MWh to 0.562 $MTCO_2$/MWh.

For more information, see:
Berkshire Hathaway Energy, Berkshire Hathaway Energy Sustainability Report (2018), *available at* https://www.berkshirehathawayenergyco.com/assets/pdf/sustainability-list.pdf
Berkshire Hathaway Energy, Berkshire Hathaway Energy: American Business Act on Climate Change (2015), *available at* https://www.berkshirehathawayenergyco.com/assets/pdf/Berkshire%20Hathaway%20Energy%20Climate%20Pledge.pdf

[136] C40 Cities & Arup, Deadline 2020: How Cities Will Get the Job Done (June 2017), http://www.c40.org/researches/deadline-2020.
[137] Cal. Air. Res. Bd., Cap-and-Trade Program, https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm (last visited June 29, 2018).
[138] AB 398, 2017-2018 Sess. (2017), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB398.

The other sub-national cap-and-trade program is the Regional Greenhouse Gas Initiative (RGGI), which currently covers $CO_2$ emissions from fossil-fired power plants in nine Eastern states. The RGGI now appears poised both to tighten its stringency and expand its reach. In August 2017, the current member states committed to lower the program's multi-state emissions cap to achieve an additional 30% reduction by 2030 (relative to 2020 levels).[139] Then, in November 2017, voters in New Jersey and Virginia elected governors who pledged to pursue RGGI membership or linkage. After the Virginia election, the state's Air Pollution Control Board launched a rulemaking to link a state cap-and-trade program to the RGGI.[140]

Other states are considering programs that would impose overall limits on power plant $CO_2$ emissions. For example, Massachusetts' environmental agency is layering a state-specific cap-and-trade program for power plants on top of the RGGI.[141] The Oregon legislature is considering legislation that would establish a state cap-and-trade program for multiple sectors.[142]

Washington has implemented a multi-sector program called the Clean Air Rule, which is not a cap-and-trade program, but operates in a similar way. It requires entities responsible for GHG emissions to achieve reductions from an entity-specific baseline on a fixed downward trajectory of 1.7% per year.[143] Regulated entities can trade credits generated by reducing emissions below the entity-specific baselines. However, Washington may need to revisit its Clean Air Rule in light of a December 2017 court decision invalidating key portions of the rule.[144] The Washington state legislature also has considered bills that would establish a carbon tax.[145]

Currently, the percentage of total U.S. GHG emissions covered by state carbon pricing policies is low.[146] However, such policies could grow in number and coverage.

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[139] Press Release, RGGI Inc., RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030 (Aug. 23, 2017), *available at* https://www.rggi.org/docs/ProgramReview/2017/08-23-17/Announcement_Proposed_Program_Changes.pdf.
[140] *See* Zullo, *supra* note 131.
[141] 310 Mass. Code Regs. 7.74 (2017) (Reducing $CO_2$ Emissions from Electricity Generating Facilities).
[142] Kelly Andrejasich, *Ore. Lawmakers Say Cap-and-Trade is on 2019 Agenda,* SNL (Mar. 5, 2018).
[143] Wash. Dep't of Ecology, *Chapter 173-442 WAC, Clean Air Rule, Chapter 173-441 WAC, Concise Explanatory Statement* at 19 (Sept. 2016), *available at* https://fortress.wa.gov/ecy/publications/documents/1602014.pdf.
[144] *See* Debra Kahn, *Judge Overturns State's Carbon-Capping Rule*, CLIMATEWIRE (Dec. 20, 2017).
[145] Coral Davenport, *In a Gamble to Make Climate Change a Political Win, a Governor Pursues a Carbon Tax*, N.Y. TIMES (Mar. 1, 2018), https://www.nytimes.com/2018/03/01/climate/jay-inslee-carbon-tax.html.
[146] *See* John Larsen, *Note: The Footprint of US Carbon Pricing Plans,* Rhodium Group (May 23, 2018), https://rhg.com/research/the-footprint-of-us-carbon-pricing-plans/ (RGGI expansion would bring the percentage of total U.S. GHG emissions covered by carbon prices to 7%.)

### B. Unit-Specific Limits on Power Plant Emissions

In addition to cap-and-trade programs and other sectoral limits, it is also possible that states will deploy unit-specific limits on power plant emissions. These standards do not impose an overall state or regional emissions cap on multiple facilities, but instead require that power generation or delivery meets certain thresholds for emissions intensity. Emissions performance standards can take a variety of forms.

Some states have adopted policies that set a maximum limit for emissions intensity in pounds of $CO_2$ per megawatt-hour (lbs $CO_2$/MWh) for in-state power plants that are newly constructed, or significantly expanded or reconstructed.

For example, California, Oregon, and Washington all use 1,100 lbs $CO_2$/MWh as their performance standard for baseload plants; New York requires 925 lbs $CO_2$/MWh.[147]

Standards can vary for non-baseload plants, which are typically operated less frequently and need to have rapid start-up and shut-down capabilities. New York has a performance standard of 1450 lbs $CO_2$/MWh for large non-baseload plants, while Oregon requires new gas-fired plants (the most frequent non-baseload unit type) to meet a performance standard of 675 lbs $CO_2$/MWh.[148]

Several states have also implemented emissions performance standards for purchased electricity, including purchases from power plants in other states. California, Oregon, and Washington allow their utilities to enter into long-term contracts for baseload power only if the plant providing the power has an emissions rate that does not exceed 1,100 lbs of $CO_2$/MWh.[149]

Distinct from setting numerical emissions targets, states may also establish policies requiring that new fossil-fired power plants capture a certain proportion of their $CO_2$ emissions. For instance, Montana requires that any new coal-fired power plant constructed by the Northwest Energy utility (which serves approximately two-thirds of the state) capture and store at least 50% of its emissions.[150]

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[147] CAL. CODE REGS. tit. 17, § 95125; OR. ADMIN. R. 345 (2017); WASH. REV. CODE ch. 80.70 (2017); N.Y. COMP. CODES R. & REGS. tit. 6, § 251 (2017). *See also* Envtl. Prot. Agency, *Cutting Power Sector Carbon Pollution: State Policies and Programs* at 22 (Aug. 2015), *available at* https://www.epa.gov/sites/production/files/2015-08/documents/existing-state-actions-that-reduce-power-sector-co2-emissions-june-2-2014_0.pdf.

[148] N.Y. COMP. CODES R. & REGS. tit. 6, § 251; OR. ADMIN. R. 345.

[149] WASH. REV. CODE ch. 80.70.

[150] MONT. CODE ANN. § 69-8-421 (2017).

### C. Portfolio Standards

In addition to directly regulating emissions from power plants, some states have established mandates affecting the mix of energy resources that power sector entities can use to supply their consumers.

The most common type of portfolio-based mandate is a Renewable Portfolio Standard (RPS). An RPS requires utilities in the state to obtain a minimum percentage of their electricity from designated renewable resources. At present, 29 states and the District of Columbia have some form of an RPS, and another 8 states have nonbinding portfolio goals.[151] The Department of Energy estimates that over half of the total non-hydroelectric renewable energy generation growth since 2000 has been to satisfy RPS requirements.[152] Several states, such as Michigan and Illinois, have increased their RPS requirements in recent years.

Some states are establishing portfolio standards that look beyond just integration of renewables. For example, ZEC programs require utilities to purchase credits from particular nuclear power plants. Both New York[153] and Illinois[154] adopted ZEC programs in 2016. These programs require utilities to purchase ZECs in a certain proportion to their share of retail load. Both states' programs have been the subject of legal challenges; to date, courts have upheld their validity.[155]

The most ambitious state portfolio programs are "clean energy standards," which take various forms. For example, Arizona utility regulators have started a proceeding to replace their RPS with an ambitious, multi-resource alternative: a "clean peak target" plan. The "clean peak target" would require the state's utilities to ensure that the electricity they deliver to meet peak demand consists of some percentage of emissions-free generation, which could come from renewable or nuclear resources.[156]

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[151] DSIRE, *Renewable Portfolio Standard Policies* (Dec. 2017), *available at* https://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2017/03/Renewable-Portfolio-Standards.pdf.

[152] Dep't of Energy, Office of Energy Pol'y & Sys. Analysis, *Transforming the Nation's Electricity System: The Second Installment of the QER*, ch. III at 3-12 (Jan. 2017), *available at* https://energy.gov/sites/prod/files/2017/01/f34/Chapter%203%20Building%20a%20Clean%20Electricity%20Future_0.pdf.

[153] N.Y. Pub. Serv. Comm'n, Order Adopting a Clean Energy Standard, Cases 15-E-0302 and 16-E-0270 (Aug. 1, 2016), *available at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b44C5D5B8-14C3-4F32-8399-F5487D6D8FE8%7d.

[154] Future Energy Jobs Act, SB 2814, 99th Gen. Assembly (Ill. 2016).

[155] *Coal. for Competitive Elec., Dynergy Inc. v. Zibelman*, No. 17-2654-CV, 2018 WL 4622696 (2d Cir. Sept. 27, 2018); *Elec. Power Supply Ass'n v. Star*, No. 17-2433, 2018 WL 4356683 (7th Cir. Sept. 13, 2018), *reh'g denied*, No. 17-2433 (7th Cir. Oct. 9, 2018).

[156] Eric Lindeman, *Arizona Panel Advances Pioneering 'Clean Peak Target'—Nukes Included,* THE ENERGY DAILY (Feb. 12, 2018); Arizona's Energy Modernization Plan, Proposed by Arizona Corporation Commissioner Andy Tobin (Jan. 30, 2018), http://www.azcc.gov/commissioners/atobin/letters/energyplan.asp.

In August 2018, the California legislature passed legislation that would require that 100% of the state's electricity come from carbon-free sources by 2045.[157] The law embeds separate interim renewable energy targets.

### D. Generation Planning

State policymakers might also use the levers of utility regulation to impose climate change mitigation mandates on power sector entities.

Several states have begun to use the Integrated Resource Planning (IRP) process to drive decarbonization of utility portfolios. Some states have required utilities to account for the "social cost of carbon" in their IRPs. For example, in Colorado, the state's Public Service Commission determined that the Public Service Company of Colorado should use the social cost of carbon as a basis for comparing the costs associated with various generation resource planning options.[158] In May 2018, the Washington Utilities and Transportation Commission issued an order directing Puget Sound Energy, Avista, and PacifiCorp to increase the social cost of carbon benchmark they use in their IRPs to $43.06 per metric ton of $CO_2$ equivalent emissions in 2020 (in 2015 dollars), escalating to $60 per metric ton by 2040.[159] In effect, these companies will need to demonstrate that their resource plans are cost-effective and beneficial to ratepayers even with this substantial price on carbon.

[157] 100 Percent Clean Energy Act of 2018, SB 100 (Ca. 2018).
[158] *In the matter of the Application of Public Service Company of Colorado for Approval of Its 2016 Electric Resource Plan*, Decision No. C17-0316 at P 87 (Colo. Pub. Serv. Comm'n Mar. 23, 2017), *available at* http://coseia.org/wp2016/wp-content/uploads/2017/05/ERP-Decision-C17-0316_16A-0396E-1.pdf.
[159] Hal Bernton, *Washington State Regulators Tell Utilities to Tally Social Costs of Carbon Emissions*, SEATTLE TIMES (May 9, 2018), https://www.seattletimes.com/seattle-news/environment/washington-state-regulators-tell-utilities-to-tally-social-costs-of-carbon-emissions/; Press Release, Wash. Utils. & Transp. Comm'n, Energy Regulators Want Closer Look at Utilities' Coal Plant Costs (May 7, 2018), https://www.utc.wa.gov/aboutUs/Lists/News/DispForm.aspx?ID=527.

In other states, utilities are expected to ensure that their plans are consistent with the state's overall emissions goals. For instance, Virginia Electric and Power Company (owned by Dominion) indicated in its 2018 IRP that the plan "reflects the Company's belief that regulation of power station [$CO_2$] emissions is virtually assured in the future, either through new federal initiatives or through measures at the state level."[160] This IRP also attempted to account for potential costs imposed by a range of future federal and state policies.[161] In 2017, Nevada passed legislation requiring the state's Public Utilities Commission to "give preference" to measures and supply sources that (among other attributes) reduce customer exposure to fossil fuel price volatility and reduce potential costs from climate policies.[162]

In the coming years, some states might emulate the approach used by Colorado in 2010. In that year, the state enacted a comprehensive law to shift from coal-fired generation to gas-fired and renewable generation, leading to significant reductions in $CO_2$ emissions.[163] Colorado has recently taken steps to achieve further decarbonization. In 2017, the Colorado Governor issued an Executive Order calling for an additional 25% reduction in $CO_2$ emissions from the state's power sector by 2025, relative to 2012 levels.[164]

### Southern Company

Southern Company is an investor-owned utility that owns more than 46,000 MW of generating capacity across 12 states.

Southern Company has expressed support for taking steps to regulate GHG emissions and has stated "that domestic policies may emerge in the future that assist in transitioning the U.S. to a lower GHG-emitting economy."

Southern Company has announced a long-term goal of achieving low- to no-carbon operations by 2050. In the interim, the company has set a goal of reducing its $CO_2$ emissions 50% below 2007 levels by 2030. To achieve these goals, it has committed to: invest in additional nuclear, natural gas, and renewable generating capacity; research and develop cost-effective energy conversion, delivery, and use technologies; and support advanced nuclear research and development. The company has stated that "significant investment over the past decade in low- and no-carbon resources is expected to further reduce future risk related to carbon emissions."

Southern Company asserts that its $CO_2$ reduction goals are in line with the International Energy Agency's Two Degrees Celsius scenario. The company also has stated that "emissions reductions in the electricity sector can provide important motivation for further electrification of the remaining end-use sectors." Southern Company is currently exploring opportunities to decarbonize the transportation sector via its electric vehicle and hydrogen research efforts.

For more information, see:
Southern Company, Planning for a Low-Carbon Future (2018), *available at* https://www.southerncompany.com/content/dam/southern-company/pdf/corpresponsibility/Planning-for-a-low-carbon-future.pdf
Southern Company, 2018 EEI ESG/Sustainability Reporting Template (2018), *available at* https://www.southerncompany.com/content/dam/southern-company/pdf/corpresponsibility/Planning-for-a-low-carbon-future.pdf

[160] Virginia Electric and Power Company's Report of Its Integrated Resource Plan, *supra* note 4, at 2.
[161] *Id.*
[162] SB 65, 79th Sess. (Nev. 2017), *available at* https://www.leg.state.nv.us/Session/79th2017/Bills/SB/SB65_EN.pdf.
[163] Clean Air-Clean Jobs Act, HB10-1365, 64th Gen. Assembly (Colo. 2010).
[164] *See* Executive Order D 2017-015, *supra* note 132.

## E. Integration of State Climate Policies in Wholesale Electricity Markets

States are also exploring measures to integrate carbon pricing into organized state and regional electricity markets.[165] The New York ISO (NYISO) recently released a detailed report evaluating how the state's decarbonization goals could be supported by pricing carbon in the electricity market,[166] and the New York Public Service Commission (PSC) has opened a docket to investigate how to approach this issue.[167] Under the concept described in the NYISO report, the PSC would set a carbon price based on the estimated economic costs of greenhouse gas emissions (the "social cost of carbon"), which would then be directly added to generator bids used to determine electricity dispatch; monies collected via the carbon adder would be remitted to customers. The Mid-Atlantic grid operator, PJM Interconnection, has begun to review similar options.[168] Such energy market policies would be intended to favor low-emitting resources relative to high-emitting resources in the electricity dispatch decisions in the region.

## F. Energy Efficiency Standards

Power sector entities also face the prospect of new state and local policies that emphasize end-user energy efficiency. Such policies seek to reduce emissions by reducing overall demand for generation, which could impose a significant impact on the bottom line of many power sector entities.

At the state level, a key energy policy tool is an EERS. An EERS sets targets for cumulative energy savings by end-users. Twenty-nine states have EERS programs.[169]

At the local level, city governments might enhance codes that mandate reductions in energy consumption by new buildings. In a report to support the Deadline 2020 Initiative, the consulting firm McKinsey and Company identified enhanced building codes as one of two

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[165] While wholesale markets fall under federal jurisdiction, states determine whether utilities should participate in those markets, and state policies can influence market design decisions.
[166] ISO New England Inc. & N.Y. Dep't of Pub. Serv., *Pricing Carbon into NYISO's Wholesale Energy Market to Support New York's Decarbonization Goals* (Aug. 10, 2017), *available at* http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Studies/Market_Studies/Pricing_Carbon_into_NYISOs_Wholesale_Energy_Market.pdf.
[167] In the Matter of Carbon Pricing in New York Wholesale Markets, N.Y. Dep't of Pub. Serv. Matter No. 17-01821 (filed Aug. 24, 2017), http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=17-01821.
[168] PJM Interconnection, Advancing Zero Emissions Objectives through PJM's Energy Markets: A Review of Carbon-Pricing Frameworks (Aug. 23, 2017), *available at* https://pjm.com/~/media/library/reports-notices/special-reports/20170502-advancing-zero-emission-objectives-through-pjms-energy-markets.ashx.
[169] Database of State Incentives for Renewables & Efficiency, http://programs.dsireusa.org/system/program (last visited August 31, 2018).

policy areas in which cities could achieve maximum impact on climate mitigation in the electric power sector.[170]

### G. State Responses to Customer Demands for Clean Energy Supplies

State policy-makers are facing increasing pressure to modify retail service regulations to allow large corporate consumers to procure power directly from renewable or low-carbon resources. More than 100 global companies have now signed on to a 100% renewable energy commitment.[171] Nearly half of the companies in the Fortune 500 have set targets for renewable energy, GHG emissions, energy efficiency, or some combination of all of those factors.[172] Not content simply to rely on "green tariffs," these companies are starting to advocate for more comprehensive overhaul of the regulatory compact. For existing loads, this could mean changes to statutes or regulations to allow consumers to gain access to competitive suppliers. New loads may simply "shop" for sites and suppliers that can help them meet their corporate goals.

For example, in July 2017, Microsoft received approval from the Washington Utilities and Transportation Commission to directly purchase power for its headquarters campus.[173] Under this arrangement, Microsoft will be free to purchase 80% of its electricity supply from suppliers other than the local utility,

#### Sacramento Municipal Utility District

SMUD is California's second largest community-owned electric service provider. SMUD serves the 1.5 million residents of Sacramento County and small adjoining portions of Placer and Yolo Counties. SMUD has stated that it is "commit[ed] to identifying and prioritizing climate changes vulnerabilities, developing and implementing resilience strategies, and measuring and reporting on the progress and success of implemented strategies."

SMUD has set goals to reduce GHG emissions by 33% below it 1990 emission levels by 2020 and 90% by 2050. To achieve these goals, SMUD is investing in renewable generation, energy efficiency, grid resiliency and modernization, and energy education. Over 50% of SMUD's power currently comes from zero-emission resources, and SMUD states that it is currently on track to have over 33% of its power come from renewable resources by 2020.

SMUD is pursuing several vehicle and building electrification initiatives, including: incentives for consumer and business adoption, support for the necessary infrastructure in both commercial and residential buildings, robust education and outreach efforts, and the provision of electric transportation for school districts. SMUD has also taken steps to decarbonize its own fleet with a variety of hybrids and electric vehicles.

For more information, see:
2018 SMUD Sustainability Report:
https://www.smud.org/sustainability/index.htm
SMUD Residential Electric Vehicles:
https://www.smud.org/en/Going-Green/Electric-Vehicles/Residential
SMUD Business Electric Vehicles:
https://www.smud.org/en/Going-Green/Electric-Vehicles/Business

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[170] McKinsey Ctr. for Bus. & Envt. & C40 Cities, *Focused Acceleration: a Strategic Approach to Climate Action in Cities to 2030* (Nov. 2017), *available at* https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Sustainability%20and%20Resource%20Productivity/Our%20Insights/A%20strategic%20approach%20to%20climate%20action%20in%20cities%20focused%20acceleration/Focused-acceleration.ashx.

[171] RE 100, https://www.theclimategroup.org/RE100 (last visited June 29, 2018).

[172] CDP et al., *Power Forward 3.0: How the largest U.S. companies are capturing business value while addressing climate change* at 2 (Apr. 2017), *available at* https://c402277.ssl.cf1.rackcdn.com/publications/1049/files/original/Power_Forward_3.0_-_April_2017_-_Digital_Second_Final.pdf?1493325339.

[173] Press Release, Microsoft, Microsoft and Puget Sound Energy receive approval for energy purchasing agreement (July 13, 2017), https://news.microsoft.com/2017/07/13/microsoft-puget-sound-energy-receive-approval-energy-purchasing-agreement/.

although the utility will continue to provide distribution and related services to Microsoft after the new tariff comes into effect.

Cities are also playing an increasing role in pressuring state policymakers and utilities to accommodate demands for renewable energy. The McKinsey report described above recommends that cities use their leverage to put pressure on state utility regulators.[174] The report outlines various strategies for cities, including aggregating the demand of smaller consumers or investing directly in renewable resources.

### H. Public Investment Funds

There is a risk that states and large cities will seek to exert influence on the carbon intensity of the portfolios of investor-owned utilities through state and municipal investments, including through public university endowments and pension funds. A growing movement has focused on urging divestment from fossil fuel companies.[175] For example, California's state government passed legislation requiring the California Public Employees' Retirement System and the California State Teachers Retirement System—the two largest pension funds in the country—to divest from coal companies.[176] New York City's pension funds, valued at over $175 billion, announced a study in February 2017 that will assess the carbon footprint of their portfolios, with the goal of managing investments around climate risks and a lower-carbon economy.[177] To date, these policies have focused on fossil fuel producers, not investor-owned utilities, but such initiatives could extend to the power sector.

#### Key Findings

Many states and localities have pledged to implement climate and clean energy policies in response to the Trump Administration's policies. Numerous jurisdictions already have such policies, ranging from cap-and-trade regulations to renewable portfolio standards to "customer choice" policies. There is a risk that state and local governments will increase the stringency of existing policies or implement new policies that require decarbonization.

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[174] McKinsey Report, *supra* note 170, at 23.
[175] Fossil Free USA, Frequently Asked Questions, https://gofossilfree.org/usa/frequently-asked-questions/ (last visited June 14, 2018).
[176] Chris Megerian, *California pension funds to drop coal-mining companies*, L.A. TIMES (Oct. 8, 2015 1:02 PM), http://www.latimes.com/politics/la-pol-sac-california-pension-divest-coal-20150930-story.html.
[177] Press Release, N.Y. City Comptroller Scott M. Stringer, New York City Pension Funds Announce Climate Change Study and Carbon Footprint Analysis (Feb. 2, 2017), https://comptroller.nyc.gov/newsroom/press-releases/new-york-city-pension-funds-announce-climate-change-study-and-carbon-footprint-analysis/.

## III. Climate Litigation Pathways

Entities in the power sector face potential exposure to climate change-related litigation. Throughout the world, courts are adjudicating a growing number of disputes about climate change mitigation and adaptation.[178] As damages from climate change become more evident and severe, there is every reason to believe such litigation will continue to increase. In addition, if the federal government removes or weakens climate change policies, stakeholders are likely to go to the judiciary in search of other pathways for imposing $CO_2$ limits on power plants.

### A. Tort Lawsuits

Climate change-related litigation falls into a number of categories. For power sector entities, the most direct risk comes from litigation claiming that companies that produce or combust fossil fuels should be held liable for causing harms from climate change. Typically, these lawsuits are based on a "public nuisance" theory, but also have invoked other species of tort.[179]

Today, such lawsuits face very high jurisdictional and evidentiary hurdles. However, any lawsuits that clear these hurdles could have very onerous consequences for the defendants. Ultimately, such lawsuits could require power sector entities either to pay monetary damages or become subject to injunctive relief in the form of emission limits. Such limits could result in stranded assets.

Between 2009 and 2012, courts considered a first wave of climate change tort cases. The cases primarily focused on claims under federal common law.[180] The decisions turned on various threshold issues of justiciability, including whether the plaintiffs had standing and whether the dispute involved a "political question" more appropriate for consideration in one of the other two branches.

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[178] United Nations Envt. Programme & Columbia L. Sch. Sabin Ctr. for Climate Change L., *The Status of Climate Change Litigation – a Global Review* at 4 (May 2017), *available at* http://columbiaclimatelaw.com/files/2017/05/Burger-Gundlach-2017-05-UN-Envt-CC-Litigation.pdf; Columbia L. Sch. Sabin Ctr. for Climate Change L., U.S. Litigation Database, http://columbiaclimatelaw.com/resources/u-s-litigation-database/ (last visited June 14, 2018).

[179] A species of tort, the common law claim of "public nuisance" generally entails "an unreasonable interference with a right general to the common public." RESTATEMENT (SECOND) OF TORTS § 821B (1977). Widely used in the area of environmental litigation, public nuisance actions can be brought by governmental plaintiffs acting to protect rights held by the general public or by private litigants alleging an injury different in kind than an injury inflicted on the general public. *Id.* § 821C(1).

[180] *Comer v. Murphy Oil USA*, 585 F.3d 855 (5th Cir. 2009), *reh'g en banc granted*, 598 F.3d 208, *on reh'g en banc*, 607 F.3d 1049 (5th Cir. 2010); *Native Vill. of Kivalina v. ExxonMobil Corp.*, 696 F.3d 849 (9th Cir. 2012); *AEP*, 564 U.S. 410.

This first wave of cases peaked with the Supreme Court's 2011 opinion in the *AEP* case, which is discussed in Section I.B above.[181] In *AEP*, the Court held that an assertion of a federal common law public tort claim against the power company defendants was displaced by the Clean Air Act. The Court reasoned that, because Congress authorized EPA to regulate domestic GHG emissions, principally through Section 111, Congress had displaced any federal common law that the judicial branch could apply.

The *AEP* decision did not shut the courthouse door to all climate-related tort lawsuits against power sector entities. For example, if the Trump EPA were to promulgate a rule interpreting Section 111(d) as unavailable as a means of limiting power plant $CO_2$ emissions, there is a risk that such a rule could remove the *AEP* obstacle to a climate-related lawsuit under federal common law.[182]

In addition, even if the *AEP* case foreclosed climate-related nuisance actions under federal common law, the decision explicitly did not bar such actions under *state* common law.[183] Furthermore, the types of justiciability issues that were pivotal in the consideration of the first wave of federal common law cases might not be obstacles in future state common law cases. States can grant their courts a broader scope of jurisdictional authority than the relatively narrow remit of federal courts.[184]

Nevertheless, future nuisance cases under state common law will still have to navigate various other jurisdictional limits, including other limits that federal law places on the states. For example, one issue for state common law litigation is whether the Clean Air Act preempts causes of action under state law for damages caused by emissions. Most modern courts have relied on savings clauses in the Clean Air Act and other provisions of the statute to reject preemption defenses against lawsuits filed under state common law.[185]

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[181] 564 U.S. 410.

[182] Such an outcome could result if the Trump EPA successfully invoked the Section 112 Exclusion, as discussed in Section I.B. of the this White Paper. On the other hand, if a future EPA could utilize other pathways under the Clean Air Act for regulation of power plant $CO_2$ emissions, as discussed in Section I.D. of the White Paper, then, under the reasoning of the *AEP* decision, there still could be a basis for concluding that Congress intended EPA to address power plant $CO_2$ emissions through the Clean Air Act and federal common law remains displaced. In any event, the issue likely would have to be resolved through litigation.

[183] *AEP*, 564 U.S. at 429.

[184] Tracy Hester, *A New Front Blowing in: State Law and the Future of Climate Change Public Nuisance Litigation,* 31 STAN. ENVTL. L. J. 49, 64-67 (2012).

[185] *See* CAA § 304(e) ("Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any emission standard or limitation or to seek any other relief . . . ."); *id.* § 116 ("Except as otherwise provided . . . nothing in this chapter shall preclude or deny the right of any State or political subdivision thereof to adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution . . . ." *See, e.g., Bell v. Cheswick Generating Station*, 734 F. 3d 188 (3d Cir. 2013) (holding that the Clean Air Act does not preempt a private tort action brought under the common law of the state where the source of emissions is located); *See also* Sam Kalen, *Policing Federal Supremacy: Preemption and Common Law*

Other federal limits on jurisdiction could establish more meaningful constraints. Such constraints could affect lawsuits in which plaintiffs in one state sue power sector entities residing in other states. In such a case, there could be constitutional limits on the extent to which the state in which the action is brought may exercise personal jurisdiction over the out-of-state defendants. Even if the lawsuit is allowed to go forward, there could also be limits on the ability of a successful plaintiff to enforce a judgement in the court of a defendant's state.[186]

Assuming a climate-related tort lawsuit could survive justiciability and jurisdictional challenges, it would encounter other hurdles. To support a tort claim, the plaintiffs would have to identify a "duty of care" with respect to GHG emissions that would distinguish owners of power plants from the hundreds of millions of owners of motor vehicles, homes, buildings and other U.S.-based sources of GHG emissions. Plaintiffs would have to further demonstrate that the power sector defendants violated this duty of care and that the violation caused their injuries. None of these elements is straightforward.[187]

From a factual standpoint, the most complicated demonstration could be proving causation, i.e., attributing particular natural disasters to climate change, and in turn, to the actions of the defendants. In this area, there have been some advances that bear monitoring. In the first instance, the science connecting increasing anthropogenic emissions not only to temperature increases but also to particular extreme weather events is becoming more refined, as evidenced in the report that the Trump Administration itself issued.[188] In addition, researchers are refining methodologies that apportion responsibility for climate damages to particular fossil fuel producers and emitters based on their portion of cumulative emissions over time.[189]

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*Damage Claims as a Ceiling to the Clean Air Act Regulatory Floor*, 68 FLA. L. REV. 1597 (2016); Howard A. Learner, *Emerging Clarity on Climate Change Law: EPA Empowered and State Common Law Remedies Enabled*, 44 ENVTL. L. REP. 10744 (2014); *but see North Carolina v. Tenn. Valley Auth.*, 615 F.3d 291 (4th Cir. 2010) (holding that Clean Air Act preempts lawsuit under state nuisance law to enjoin emissions from in-state power plants).

[186] Hester, *supra* note 184, at 76-82.

[187] *See generally* Douglas Kysar, *What Climate Change Can do About Tort Law?*, 41 ENVTL. L. 1 (2011).

[188] Wuebbles, *supra* note 62; *see also* National Academy of Sciences, Engineering and Medicine, *Attribution of Extreme Weather Events in the Context of Climate Change* (2016).

[189] Sophie Marjanac, Lindene Patton & James Thornton, *Acts of God, Human Influence, and Litigation*, 10 NATURE GEOSCIENCE 616 (Aug. 28, 2017), https://www.nature.com/articles/ngeo3019; *Climate-Change Lawsuits*, THE ECONOMIST (Nov. 2, 2017), https://www.economist.com/news/international/21730881-global-warming-increasingly-being-fought-courtroom-climate-change-lawsuits; Carbon Majors, http://carbonmajors.org/ (last visited June 14, 2018); Peter C. Frumhoff & Myles Allen, *Big Oil Must Pay for Climate Change. Now We Can Calculate How Much*, THE GUARDIAN (Sept. 7, 2017 10:00 AM), https://www.theguardian.com/commentisfree/2017/sep/07/big-oil-must-pay-for-climate-change-here-is-how-to-calculate-how-much; Sabrina McCormick et al., *Science in Litigation, the Third Branch of U.S. Climate Policy*, 357 SCI. 979 (Sept. 8, 2017), http://science.sciencemag.org/content/357/6355/979; Chelsea Harvey, *Scientists Can Now Blame Individual Natural Disasters on Climate Change*, CLIMATEWIRE (Jan. 2, 2018).

The latest arena for "second wave" climate tort litigation is in California,[190] New York City,[191] the State of Washington,[192] and Baltimore.[193] The defendants in each of the complaints are not power companies, but rather major producers and refiners of fossil fuels. In general, the plaintiffs in these lawsuits are alleging that the defendants have known for nearly 50 years about climate change, concealed the risks from the public, and engaged in actions that have contributed toward rising sea levels, which in turn has caused communities to spend money on damages from increased storm activity and on climate adaptation. They allege that, collectively, the companies account for over a large percentage of cumulative global GHG emissions in the last 50 years.[194] These lawsuits are in the early stages of procedural skirmishes. So far, different courts have arrived at different views on key issues. District court judges in California and New York dismissed two of the complaints.[195] Another California district court rejected a motion to dismiss.[196] Each of these orders likely will be appealed.

Monitoring the progress of these and future such cases is important. Even if there are high hurdles to decisive verdicts against the defendants in the current cases aimed at oil companies, or in future cases involving the power sector, climate-related litigation could drain company resources and impose reputational harm. Accordingly, this second wave of climate-related tort lawsuits presents an ongoing risk to power sector entities.

### B. Other Types of Litigation and Claims

Though nuisance lawsuits present the most direct risk for power sector entities, other types of climate change-related litigation are also relevant for long-term planning in the sector.

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[190] *See* Complaint, *City of Oakland v. BP P.L.C.,* No. RG17175889 (Cal. Super. Ct. filed Sept. 19, 2017); Complaint, *City of San Francisco v. BP P.L.C.,* No. CGC-17-561370 (Cal. Super. Ct. filed Sept. 19, 2017); Complaint, *City of Imperial Beach v. Chevron Corp*., No. 17-cv-01227 (Cal. Super. filed July 17, 2017); Complaint, *County of San Mateo v. Chevron Corp*., No. 17-cv-03222 (Cal. Super. Ct. filed July 17, 2017); Complaint, *County of Marin v. Chevron Corp*., 17-cv-02586 (Cal. Super. Ct. filed July 17, 2017).

[191] Complaint, *City of New York v. BP P.L.C.*, No. 18-cv-182 (S.D.N.Y. filed Jan. 9, 2018).

[192] *See* Notice of Removal, *King County v. BP PLC*, No. 18-cv-00758 (W.D. Wash. filed May 25, 2018) (filing by Chevron to remove the case from state court to federal court); *Board of County Commissioners of Boulder County v. Suncor (U.S.A.)*, 2018CV030349 (Colo. Dist. Ct. filed Apr. 17. 2018).

[193] Complaint, *City of Baltimore v. BP P.L.C.*, No. 18-cv-02357 (D. Md. Filed July 31, 2018) (removed from state court to federal court).

[194] *See, e.g*., Complaint of City of Imperial Beach, *supra* note 190, ¶ 7 (defendants account for 20% of cumulative global GHG emissions from 1965 to 2015).

[195] Opinion & Order Granting Motion to Dismiss Complaints, *City of New York v. BP P.L.C.*, No. 18-cv-182 (S.D.N.Y. July 19, 2018); Order Granting Motion to Dismiss Amended Complaints, *City of Oakland v. BP P.L.C.*, No. C17-06011, 2018 WL 3109726 (N.D. Cal. June 25, 2018), *appeal docketed*, No. 18-16663 (9th Cir. Sept. 4, 2018).

[196] Order Granting Motions to Remand, *County of San Mateo v Chevron Corp.*, No. 3:17-cv-04929-VC (N.D. Cal. Mar. 16, 2018), *appeal docketed*, No. 18-15499 (9th Cir. Mar. 27, 2018).

For example, there are various lawsuits against federal and state governments aimed at compelling the establishment of climate change policies. A number of cases allege that governments are failing to fulfill mandatory statutory duties to regulate or consider the impact of GHG emissions.[197] If the Trump Administration continues to unwind Obama-era climate policies, such cases presumably will increase in number and scope.[198]

Courts are also hearing new claims that, aside from statutory law, the government has a constitutional duty to mitigate climate change harms or a duty to protect the "atmospheric trust."[199] These latter cases, which are still in early stages, could be relevant if, for example, Congress amended the Clean Air Act to limit or remove EPA's authority to regulate GHGs. If successful, these lawsuits could establish an alternative basis for a government obligation to address climate change. These constitutional and public trust cases underscore the risk that even a comprehensive effort by both the Executive Branch and the Legislative Branch to roll back federal GHG regulatory authority cannot provide absolute assurances of long-term durability.

### Key Findings

Power sector entities face risk from climate-related litigation. The most significant risk is from tort-style lawsuits seeking to hold energy companies liable for climate-related damages. The sector also faces risks from lawsuits aimed at establishing a constitutional or other underlying duty for governments to implement policies to regulate GHGs. While climate-related litigation currently faces high hurdles, plaintiffs' lawyers are constantly testing new theories and new cases to clear those hurdles.

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[197] *See* U.S. Litigation Database, *supra* note 178 (select Federal Statutory Claims or State Law Claims).

[198] David Bookbinder, *How Trump's Reckless Climate Policy Invites a Judicial Backlash,* VOX (Dec. 11, 2017), https://www.vox.com/the-big-idea/2017/12/11/16759208/trump-climate-policy-courts-juliana-public-nuisance-lawsuits ("The Trump Administration's climate policy (for want of a better word) may precipitate a judicial reaction eventually leading to greater restrictions on fossil fuels than any contemplated under the regulatory program [Trump EPA Administrator] Scott Pruitt. And if that happens, it will achieve this in a far more fragmented, *ad hoc*, uncoordinated—and thus significantly more expensive—manner than any such regulatory program."); *Absent Federal Policy, Governments File Tort Suits for Environmental Harms*, INSIDEEPA.COM (May 17, 2018), https://insideepa.com/weekly-focus/absent-federal-policy-governments-file-tort-suits-environmental-harms.

[199] U.S. Litigation Database, *supra* note 178 (select Constitutional Claims and Public Trust Claims); Complaint, *Juliana v. United States*, No. 15-cv-01517 (D. Or. filed Aug. 12, 2015), *stayed by* Order, *In re United States*, No. 18A410 (U.S. Oct. 19, 2018); *Kain v. State Dep't of Envtl. Prot.*, 49 N.E.3d 1124 (Mass. 2016), *on remand*, No. SUCV2014-2551, 2016 WL 8377773 (Mass. Super. June 20, 2016); *Chernaik v. Kitzhaber*, 328 P.3d 799 (Or. 2014); *Sanders-Reed ex rel. Sanders-Reed v. Martinez*, 350 P.3d 1221, 1225 (N.M. 2012). *Cf. Alec L. ex rel. Loorz v. McCarthy*, 561 Fed. App'x 7 (D.C. Cir. 2014); *Kanuk ex rel. Kanuk v. State, Dep't of Natural Res.*, 335 P.3d 1088 (Alaska 2014); *Filippone ex rel. Filippone v. Iowa Dep't of Natural Res.*, 829 N.W.2d 589 (Ct. App. Iowa 2013). *See generally* Mary Christina Wood & Charles W. Woodward, IV, *Atmospheric Trust Litigation and the Constitutional Right to a Healthy Climate System: Judicial Recognition at Last*, 6 WASH. J. ENVTL. L. & POL'Y 633 (2016).

# IV. Opportunities from Climate Policy: Electrification

## A. Introduction

The possibility of federal and state climate policies creates not only business risks for the U.S. power sector, but also a potential opportunity for long-term load growth through increased electrification of the economy.

The majority of U.S. GHG emissions arise from use of fossil fuels in sectors other than the electric power sector—principally in the transportation, buildings, and industrial sectors.[200] A number of studies of climate policies have recommended measures that would encourage a shift from direct use of fossil fuels in these sectors to the use of electricity; these studies conclude that these measures would result in an overall decline in $CO_2$ emissions.[201] As the electricity sector decarbonizes, the carbon footprint of electrical devices is reduced.[202]

Policies that promote electrification of these sectors as a means of reducing $CO_2$ emissions could lead to a substantial increase in electricity demand. The National Renewable Energy Laboratory ("NREL") has found that widespread electrification in these three sectors could cause a doubling of electricity demand by 2050 relative to business-as-usual projections.[203] The Obama Administration's 2016 "Mid-Century Strategy for Deep Decarbonization" reaches similar conclusions.[204] Electrification and associated opportunities for load shifting, could also drive down the peak-to-average load ratio, smoothing the hourly load shape and increasing the overall efficiency of the U.S. power system.[205]

While the opportunities from electrification loom large for the U.S. power sector, there is a sizable gap between today's reality and the modeled outcomes for 2050. For the

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[200] Envtl. Prot. Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2015 (2017), https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2015.
[201] *See* Daniel Steinberg et al., *Electrification & Decarbonization: Exploring U.S. Energy Use and Greenhouse Gas Emissions in Scenarios with Widespread Electrification and Power Sector Decarbonization*, NAT'L RENEWABLE ENERGY LAB. (July 2017), *available at* https://www.nrel.gov/docs/fy17osti/68214.pdf [hereinafter, NREL Report]; Jürgen Weiss et al., *Electrification: Emerging Opportunities for Utility Growth*, THE BRATTLE GRP. (Jan. 2017), *available at* http://www.brattle.com/system/publications/pdfs/000/005/396/original/Electrification_-_Emerging_Opportunities_for_Utility_Growth.pdf?1485268804 [hereinafter, Brattle Group Report]; Geoffrey J. Blanford & John E. Bistline, *Decarbonization through Electrification: A New US Model of End-Use Demand*. International Energy Workshop, College Park, MD (July 13, 2017). *See also Mid-Century Strategy for Deep Decarbonization*, *supra* note 121.
[202] *See, e.g.,* David Roberts, *The key to tackling climate change: electrify everything*, VOX (Oct. 27, 2017 8:48 AM), https://www.vox.com/2016/9/19/12938086/electrify-everything.
[203] NREL Report, *supra* note 201, at 31.
[204] *Mid-Century Strategy for Deep Decarbonization*, *supra* note 121, at 48.
[205] *Id.*

transportation sector, in particular, there are major questions around how to develop charging infrastructure, and what role utilities should play in developing and owning such infrastructure. Policy-makers are seeking to balance different priorities: charging infrastructure should be built expeditiously, available in key locations, accessible on equitable basis, and subject to free-market competition. The shape of charging infrastructure policies in a particular state could depend heavily on the state's regulatory structure for utilities, i.e., whether they are vertically integrated, partially regulated, municipally owned, or otherwise situated.[206] In other words, while electrification policies present a significant long-term opportunity for the power sector, the pathway from here to there will involve some complexities and challenges. The rate at which federal and state policymakers adopt electrification measures for other sectors will be a function of many factors. One of the factors likely will be the carbon intensity of the power sector. Because the case for electrification as a climate policy is stronger if the power consumed has a low (or zero) carbon intensity, it follows that actions by the U.S. power sector to reduce $CO_2$ emissions can help unlock the electrification opportunity.

Also, all other things being equal, power sector entities that reduce the emissions profile of their generation portfolios will have an easier time taking advantage of the upside revenue potential of electrification. Such entities will be able to meet the increased demand from electrification while minimizing the regulatory costs (*e.g.,* costs of installing emission controls or obtaining emission credits) associated with increased generation.

For power sector entities, in other words, risk mitigation and opportunity management could be two sides of the same coin.

What follows is a summary of electrification opportunities in each of the three sectors.

## B. Transportation Sector

The transportation sector generated approximately 36% of total energy-related $CO_2$ emissions in 2016, surpassing the power sector.[207] Electric vehicles are becoming more popular in the United States, and there is a significant potential for future growth.[208]

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[206] Garrett Fitzgerald & Chris Nelder, *From Gas to Grid: Building Charging Infrastructure to Power Electric Vehicle Demand*, ROCKY MOUNTAIN INST. (2017), *available at* https://www.rmi.org/wp-content/uploads/2017/10/RMI-From-Gas-To-Grid.pdf.

[207] U.S Energy Info. Admin., Power Sector Carbon Dioxide Emissions Fall Below Transportation Sector Emissions (Jan. 19, 2017), https://www.eia.gov/todayinenergy/detail.php?id=29612.

[208] NREL Report, *supra* note 201; Adam Cooper & Kellen Schefter, *Plug-in Electric Vehicle Sales Forecast Through 2025 and the Charging Infrastructure Required*, INST. FOR ELEC. INNOVATION & EDISON ELEC. INST. (June 2017), *available at* http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20PEV%20Sales%20and%20Infrastructure%20thru%202025_FINAL%20(2).pdf; Peter Slowik & Nic Lutsey, *Expanding the Electric Vehicle Market in U.S. Cities*, INT'L COUNCIL ON CLEAN TRANSP. (July 2017), *available at*

Electrification of the transportation sector can increase electric generators' load factors and reduce per unit costs of electricity, while helping to reduce $CO_2$ emissions from both the power and transportation sectors.[209] Vehicle charging, particularly for light-duty vehicles, is potentially a major new market for power companies in the medium- to long-term.

At the state level, California's Low Carbon Fuel Standard policy, together with the Zero Emission Vehicle mandates adopted initially by California and now nine other states, support electrification of the transportation sector.[210] Governor Jerry Brown recently announced that the state is considering banning the sale of vehicles powered by internal-combustion engines. Mary Nichols, Chair of the California Air Resources Board, has suggested that implementation of such a ban could begin in as little as a decade.[211]

Ultimately, U.S. policy makers could follow the pathway charted by countries such as China, France, and the United Kingdom.[212] Each has announced plans to phase out internal combustion engines. In these countries, sales of vehicles with internal combustion engines are slated to end between 2030 and 2040.[213]

### C. Residential and Commercial Buildings Sector

The residential and commercial buildings sector generated approximately 11% of U.S. $CO_2$-equivalent emissions in 2014.[214] Although this sector is already highly electrified, certain building activities—including space heating, water heating, and cooking—continue to be fueled predominantly by fossil resources (natural gas, oil, and propane).[215]

Unlike the transportation and industrial sectors, where technological advancements are needed to bring about large-scale electrification, the technology currently exists to electrify

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http://theicct.org/sites/default/files/publications/US-Cities-EVs_ICCT-White-Paper_25072017_vF.pdf [hereinafter, ICCT Report].

[209] Garrett Fitzgerald, Chris Nelder & James Newcomb, *Electric Vehicles as Distributed Energy Resources*, ROCKY MOUNTAIN INST. – ENERGY INNOVATION LAB (2017), *available at* https://www.rmi.org/wp-content/uploads/2017/04/RMI_Electric_Vehicles_as_DERs_Final_V2.pdf.

[210] Brattle Group Report, *supra* note 201, at 5 n.14; ICCT Report, *supra* note 208, at 9-10; Int'l Energy Agency, *Global EV Outlook 2017: 2 Million and Counting* at 15 (2017), *available at* https://www.iea.org/publications/freepublications/publication/GlobalEVOutlook2017.pdf [hereinafter, IEA Report].

[211] Ryan Beene & John Lippert, *California Considers Following China with Combustion-Engine Car Ban*, BLOOMBERG (Sept. 26, 2017 12:57 PM), https://www.bloomberg.com/news/articles/2017-09-26/california-mulls-following-china-with-combustion-engine-car-ban.

[212] *Id.*; *see also* EIA Report, *supra* note 207.

[213] *See* Ryan Beene & John Lippert, *supra* note 211.

[214] NREL Report, *supra* note 201, at 2-3.

[215] *Id.* at 6; Brattle Group Report, *supra* note 201, at 5.

almost all remaining end-use service demands in residential and commercial buildings.[216] Hence, load growth is viable in the short-term. The biggest challenges are consumer preference and cost-competitiveness of electrifying these end uses.[217] NREL reports that consumers are increasingly adopting on-demand electric water heaters and "mini-split" heat pump units.[218]

### D. Industrial Sector

The U.S. industrial sector is diverse, as are its energy needs, which include process heating, process cooling, refrigeration, machine drive, facility HVAC, facility lighting, hot water and steam production, and onsite transportation. The sector accounted for 15% of U.S. carbon dioxide-equivalent emissions in 2014.[219] Of this, approximately 52% resulted from combined heat and power, boiler, and process heat applications.[220] Electrification of these applications may be feasible in the medium- to- long-term.

#### Key Findings

The possibility of expanded federal and state climate policies creates a potential market opportunity for power sector entities in the form of increased electrification of the economy. "Deep decarbonization" studies contemplate doubling consumption of electricity in the United States by mid-century. Because of the potential for electrification, risk mitigation and opportunity management could be two sides of the same coin for the power sector. Power sector entities that decarbonize their portfolios can both reduce their exposure to regulation and smooth the pathway to increased revenues from broad-based electrification.

[216] NREL Report, *supra* note 201, at 6.
[217] *Id.*
[218] *Id.* at 7.
[219] *Id.* at 2-3.
[220] *Id.* at 3, 5 n.17.

## V. Conclusions

This White Paper concludes that power sector entities are subject to significant risks from climate-related regulation and litigation over the long run. To be sure, future carbon constraints are not necessarily inevitable. However, the White Paper identifies many regulatory pathways supported by plausible interpretations of existing law that would be available to an administration seeking to promulgate GHG regulations under the Clean Air Act. Future regulatory mandates on the power sector could be significantly more stringent than the climate policies that have been considered to date, presenting potential transition risks. Moreover, creative litigation theories are very likely to be fully tested over the next decade, adding a layer of risk for significant emitters.

Accordingly, the White Paper concludes that the cumulative long-term risks to the power sector from climate regulation or litigation are significant and that entities in the sector should incorporate these risks into their planning and management. Failure to manage these risks could expose power sector entities to adverse economic impacts, such as stranded assets and lost profits. Conversely, power entities in competitive markets that do manage risks and opportunities could gain ground on competitors that do not.

Climate policy could also have a silver lining for the power sector in the form of increased electrification of the economy. Efforts by power sector entities to decarbonize their portfolios could make it easier for policymakers to adopt electrification policies and for entities to maximize their gains from such policies. Accordingly, power sector entities should manage not only the risks but also the potential opportunities arising from future climate policies.