

Unlocking Willpower and Ambition to Meet the Goals of the Paris Climate Change Agreement (Part Two): The Potential for Legal Reform and Revision

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Summary

In a previous Comment, 46 ELR 11024, the authors examined the nexus between “willpower” and “ambition” in the context of the Paris Agreement, and identified key elements of an integrated, systematic, and strategic treatment of each through law and policy. In this Article, they explore legal mechanisms that could close the gaps in carbon reduction implementation in the United States and also meet critical conditions needed to build willpower. The incoming Administration's focus on reform and revision calls into question some current approaches to climate change, but also may provide carbon reduction opportunities through proposed actions on infrastructure, national security, and other matters driven by immediate priorities. Pragmatic actions within U.S. states and localities, federal executive agencies, and Congress could be a good place to start to integrate such goals and charter a more systematic and strategic framework to move carbon reductions to the level required by the Paris Agreement.

In our initial Comment,¹ we noted that the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC)² Paris Agreement established significant new goals for all Parties. The Agreement “brings all nations into a common cause to undertake take [sic] ambitious efforts to combat climate change and adapt to its effects,”³ and includes goals of “[h]olding the increase in the global average temperature to well below 2° [Celsius (C)] above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.”⁴ Additionally, the Agreement states that “[a]ll Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies.”⁵ These goals are conditioned by feasibility, need, and circumstance, as stated in Article 4:

In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

To implement these objectives, the Paris Agreement requires Parties to make commitments to emission limitations known as intended nationally determined contributions (NDCs),⁶ and to update those commitments periodically as they are implemented. NDCs provide a

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1. Thomas D. Peterson et al., *Unlocking Willpower and Ambition to Meet the Goals of the Paris Climate Change Agreement (Part One): Shifting Needs of Law, Policy, and Economics*, 46 ELR 11024 (Dec. 2016).
2. UNFCCC, June 4, 1992, 1771 U.N.T.S. 107, available at http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.
3. UNFCCC, *The Paris Agreement*, http://unfccc.int/paris_agreement/items/9485.php (last visited Dec. 15, 2016).
4. United Nations Paris Agreement, art. 2, §1(a), available at http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.
5. *Id.* at art. 4, §19.
6. Note that on September 3, 2016, the United States ratified the Paris Agreement, and at that time, its “Intended” Nationally Determined Contribution, or INDC, became its “Nationally Determined Contribution”

golden opportunity for free and open choice on specific national approaches toward the establishment and implementation of climate change commitments. The NDC mechanism is an outgrowth of policy evolution following experience with the Kyoto Protocol and the need for stronger levels of self-determination and empowerment for all nations.⁷

We also noted in our initial Comment that, to date, the UNFCCC has formally approached ambition as a matter of environmental stringency in the form of greenhouse gas (GHG) emissions goals.⁸ In terms of policy commitments, these goals are subject to national determination and are the equivalent of “talking the talk” toward new mitigation actions unless, and until, they are actually implemented. While ambition is formally articulated within various agreements and activities of the COPs, it has not yet been paired with a formal, parallel concept of willpower—or “walking the walk”—by enabling the conditions and activities needed to achieve GHG mitigation goals.

The absence of the concept of willpower and its manifestation in UNFCCC programs and guidance represent a gap in the formulation of international climate change law and policy that poses a major strategic challenge and opportunity. We identified five specific conditions needed to expand willpower to match ambition:

1. Alignment of climate change law and policy with national vision and priorities
2. Assurance of capacity needed to implement, including manpower and money
3. Improvement of public support and collaboration through public involvement in policy formulation and implementation
4. Provision of freedom of choice on preferred low-carbon policy approaches
5. Access to effective tools for locally applied low-carbon policy and implementation decisions

In this Article, we note that the legal and policy preferences expressed by the incoming Donald Trump Administration call into question “business-as-usual” approaches to climate change, but nonetheless might provide several carbon reduction opportunities through actions on infrastructure, national security, and other matters, if combined with strategies to build willpower and ambition. We expect opportunities to expand willpower and ambition in the United States, as well as in other nations, to arise through a variety of ways, including:

- Development of new law and policy through direct means (climate change actions per se, including single-

sector and multisector approaches) as well as indirect means (e.g., energy and economic policy integration, including piecemeal and broader-scale actions).

- More creative applications of existing law and policy, including certain actions that can be forced by litigation.

In the Article, we explore legal mechanisms that could integrate willpower and ambition and close the gaps in carbon reduction implementation under the Paris Agreement, particularly with better use of existing law in the United States. We also comment briefly on the characteristics of successful legislative approaches based on past experience.

Legal mechanisms have taken on a heightened significance following the change in U.S. administrations and the possibility that prior U.S. commitments may be significantly altered. The mandatory duties to prevent endangerment of health and the environment throughout the Clean Air Act (CAA),⁹ as well as other authorities, provide potential mechanisms both to preserve existing progress and to provide expanded support for programs that achieve necessary reductions across all sectors of the economy by means that also build willpower for such actions. Reliance on existing legal mechanisms alone may be insufficient to produce the emissions reductions on a time line that will result in achieving the Paris climate goals. This may necessitate new legislative and policy approaches that advance national priorities and meet other conditions of willpower that are needed, such as meeting the new administration’s interest in promoting infrastructure development and job growth.

Methods to enhance ambition and match it with willpower are critically important, as current NDC estimates will allow global average temperature to rise 4°C above pre-industrial levels. The Paris goal of 2°C stabilization requires significant GHG reduction, and the secondary 1.5°C stabilization goal will require even more. Achievement of either goal will require that policies be developed and integrated over all sectors of the economy and be implemented more fully and expeditiously than contemplated by many of the NDCs. As noted in our initial Comment, this will necessitate an approach that integrates a series of willpower requirements.¹⁰

Existing laws in the United States and elsewhere can support pathways for climate stabilization that also provide momentum for building political and economic willpower and ambition. In the United States, the CAA provides a mechanism that may allow states to employ the types of measures that achieve these broader goals and conditions, but it will require a shift away from narrow technology-based, single-sector approaches. State planning efforts have already shown that multi-objective, multisector, participatory, implementation-driven policy development processes that incorporate investment, capacity, and governance

or NDC. For ease of reference, the authors use the acronym NDC throughout this Article.

7. Prior to the formal adoption of this mechanism in the Paris Agreement, the commitments were referred to as Intended Nationally Determined Contributions, or INDCs, and that terminology is still used frequently.

8. Peterson et al., *supra* note 1.

9. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.

10. Peterson et al., *supra* note 1.

needs can build the willpower and ambition necessary to achieve the required GHG reductions.¹¹

It is worth noting that federal programs that promote other important goals, such as the Energy Independence and Security Act (EISA) of 2007¹² and the Economic Stimulus Act of 2008,¹³ have also accomplished significant GHG reductions where integration of multiple priorities has been attempted. Litigation, as well as public pressure, is beginning to drive similar approaches in states and nations, and can potentially drive a broader and more ambitious result in the United States. Although President Trump has expressed an intent to pull back from the Paris Agreement and the U.S. Environmental Protection Agency's (EPA's) Clean Power Plan (CPP),¹⁴ his ability to do so will be constrained by the law; regardless, however, follow-through on his commitments to infrastructure development and federal program reforms could provide an alternative path to achieving significant GHG reductions.

This Article proposes that alternative policy approaches available under existing law are more likely than the current approach focusing on technology-based standards to address limitations, and build both the ambition and willpower necessary to reduce GHG emissions by the second half of this century in a way that meets the national interest of the United States or other nations. It concludes with suggestions on specific approaches not available under existing law that might achieve GHG emission reductions while also advancing the priorities of President Trump.

I. The Paris Agreement

In December 2015, after nearly two weeks of meetings in Paris, representatives from 195 nations adopted the historic Paris Agreement to combat climate change. The Agreement entered into force pursuant to its terms on November 4, 2016, following its ratification by more than 55 nations, representing more than 55% of global GHG emissions.¹⁵

The Paris Agreement is intended to further define the global framework under the UNFCCC by which the world's countries will work together to reduce global GHGs while holding the increase in the global average temperature to well below 2°C, or 3.6° Fahrenheit (F), above pre-industrial levels.¹⁶ The signatories also agreed to pursue efforts to limit the increase to 1.5°C (2.7°F).¹⁷ The Agreement further specifies that the accomplishment of this goal will require achieving peaks in national GHG emissions as soon as possible to meet new temperature goals.¹⁸ The

United States, Canada, Mexico, and Germany have formulated 2050 scenarios in response, and several other nations are in the process of doing so, to lay the groundwork for more detailed, longer-term implementation actions.

The commitments to limit temperature changes define the more general goal of the UNFCCC to prevent “dangerous anthropogenic interference with the climate system.”¹⁹ Because the UNFCCC has been fully ratified by the United States with the advice and consent of the U.S. Senate and the Paris Agreement merely defines the terms of that existing treaty, the president ratified the Paris Agreement without the need for the advice and consent of the Senate. Accordingly, because the Paris Agreement has entered into force, it is possible that these central terms of the Paris Agreement are enforceable as existing international law that must be implemented under the existing law of many nations, regardless of whether the United States seeks to withdraw from the Paris Agreement.

Under the Paris Agreement, both developed and developing nations have committed to GHG reduction targets, referred to as NDCs. The Agreement requires each country to revise its NDCs every five years beginning in 2020, and to use an international accounting system to report on its progress in reducing carbon emissions, starting in 2023.²⁰ The revised targets are to be submitted nine to 12 months in advance of being finalized to allow other nations to review and comment on the targets. The intent is that each cycle of revised NDCs will reflect progress in reducing GHGs from the prior one.

The U.S. NDC sets an initial economywide goal of reducing global warming emissions by 26-28% below 2005 levels by 2025, committing to its best efforts in achieving a 28% reduction.²¹ The United States identifies regulations adopted under the CAA, EISA, and the Energy Policy Act of 2005²² as the domestic laws, regulations, and measures to be used for implementation of the NDC. The specific future regulatory measures that the United States identifies are largely regulations under the CAA. These include the CPP promulgated under CAA §111(d), existing and proposed mobile source emission limits established under Title II of the CAA, proposed measures to limit methane emissions under various sections of the CAA, and measures to reduce hydrofluorocarbons.²³

Article 28 of the Paris Agreement provides that no Party may withdraw from the Agreement for at least three years from its effective date, and that withdrawal will not take effect until a year after notice is provided. Although

11. Many, but not all, such planning efforts have followed this more ideal approach.

12. 42 U.S.C. ch. 152, §17001 et seq. (2007).

13. Pub. L. No. 110-185, 122 Stat. 613 (Feb. 13, 2008).

14. Clean Power Plan Rule, 80 Fed. Reg. 64662 (Oct. 23, 2015).

15. Paris Agreement, art. 21, §1; see UNFCCC, *Paris Agreement—Status of Ratification*, http://unfccc.int/paris_agreement/items/9444.php (last visited Dec. 15, 2016).

16. Paris Agreement, art. 2, §1(a).

17. *Id.*

18. *Id.* art. 4, §1.

19. UNFCCC, art. 2; see also Paris Agreement, art. 2, §1 (holding increase to 2°C, “in enhancing the implementation of the Convention”).

20. Paris Agreement, art. 4.

21. UNFCCC, NDC Registry, United States of America First NDC, <http://www4.unfccc.int/ndcregistry/pages/Party.aspx?party=USA>.

22. 42 U.S.C. §§13201 et seq. (2005).

23. *Supra* note 19. The United States also cites energy conservation measures. The Paris Agreement includes myriad other commitments intended to significantly mitigate worldwide GHGs and to promote and fund resiliency strategies where necessary to adapt to changed climate conditions. For purposes of this Article, the authors' focus is on the mitigation commitments anticipated and likely required by the NDCs and the Paris Agreement's definition of the goals of the UNFCCC.

President Trump ran on a pledge of withdrawing from the Paris Agreement, the United States would be unable to provide notice of withdrawal until November 4, 2019, and the withdrawal would not take effect until November 4, 2020.²⁴

Moreover, withdrawal may be ineffective as a matter of both international and domestic law. First, because the Paris Agreement merely interprets the intent of the UNFCCC to be effective, the United States would arguably need to also withdraw from the UNFCCC. Although Article 25 of the UNFCCC authorizes any Party to withdraw from the UNFCCC by providing notice to all other Parties, and specifies that the withdrawal will take place within one year, the withdrawal terms of the Paris Agreement arguably now govern. Second, under the U.S. Constitution, there is at least a colorable question as to whether the president could withdraw from the UNFCCC, which was adopted with the consent of the Senate, without also seeking the further advice and consent of the Senate pursuant to Article II, §2, Clause 2 of the Constitution.²⁵ Third, even if the United States withdraws from both the Paris Agreement and the UNFCCC, the operative requirements could still be binding on the United States as customary international law.²⁶

II. The CPP

In 2014 and 2015, EPA promulgated rules regulating carbon dioxide (CO₂) emissions from new fossil fuel-fired electric generating units (EGUs)²⁷ and emission guidelines for states to follow in preparing plans to regulate carbon pollution from existing EGUs, referring to the latter rule

as the Clean Power Plan.²⁸ Both rules have been appealed, with a significant number of states, cities, industry representatives, and nongovernmental organizations on both sides of the litigation. The challengers moved for a stay of the CPP and the U.S. Court of Appeals for the District of Columbia (D.C.) Circuit denied the motion and accelerated its schedule for review of the regulation. The U.S. Supreme Court, in a 5-4 vote divided along partisan lines, took the unprecedented action of staying implementation of the CPP pending judicial review, despite the absence of a reviewable decision by the court of appeals.²⁹ No reasons were given. The D.C. Circuit subsequently took the equally unusual step of ordering review of the regulation en banc, and heard oral argument on September 27, 2016.

The statutory foundation for the CPP is §111(d), pursuant to which states must establish standards of performance for existing sources that reflect the best system of emission reduction (BSER) that the EPA Administrator determines are adequately demonstrated.³⁰ The BSER standard thus is technology-based. In some prior rulemakings under §111(d), EPA has stuck to source-limited performance standards applicable to the design and operation of the source itself without considering the larger system within which the source operates (i.e., “inside the fence”), although this approach does not reflect the majority of rules promulgated under that section.³¹ Given the nature of

24. Under international law a State cannot “invalidate its consent to be bound by an agreement” unless (a) there was an error of fact or circumstances essential to the Parties’ consent had changed or there was fraud or corruption, or (b) the agreement is void because it was procured by corruption or is inconsistent with an international norm. RESTATEMENT OF THE LAW (THIRD), THE FOREIGN RELATIONS LAW OF THE UNITED STATES §331 (1987) [hereinafter RESTATEMENT]. A nation may, however, withdraw from an agreement either in conformity with that agreement or by the consent of the Parties. *Id.* §332.

25. The withdrawal itself would not be reviewable. *See Goldwater v. Carter*, 481 F. Supp. 949 (D.D.C. 1979) (holding that consent was required, stating “[l]ike treaty formation, treaty termination is comprised of a series of acts that seek to maintain a constitutional balance”), *rev’d*, 617 F.2d 697 (D.C. Cir. 1979) (holding en banc that the president has power to withdraw without consent), *vacated*, 444 U.S. 996 (1979) (vacated for lack of jurisdiction, with four Justices concurring based on the political question doctrine, one holding the issue was not ripe, one giving no reason, and one holding that it was within the president’s power to withdraw without consent). However, if the effect of the withdrawal were to become an issue in judicial review of the impact of the Paris Agreement on decisions under the CAA, the issue may not evade judicial review.

26. Some international agreements “may come to be law for non-parties that do not actively dissent.” RESTATEMENT §102, cmt. i. “If an international agreement is declaratory of, or contributes to, customary law, its termination by the parties does not of itself affect the continuing force of those rules as international law.” *Id.* *See* RESTATEMENT §102, n.5; *North Sea Continental Shelf* (Federal Republic of Germany v. Denmark & Netherlands), 1969 I.C.J. 3, 28-29, 37-43 (Judgment of 20 Feb. 1969); *Case Concerning Delimitation of the Maritime Boundary of the Gulf of Maine* (Canada/United States), 1984 I.C.J. 246, 294 (Judgment of 12 Oct. 1982).

27. Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 1430 (Jan. 8, 2014).

28. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64662 (Oct. 23, 2015).

29. *Chamber of Commerce v. Environmental Protection Agency* 136 S. Ct. 999 (2016).

30. 42 U.S.C. §§7411(a)(1), 7411(d).

31. *See* Richard L. Revesz et al., *Familiar Territory: A Survey of Legal Precedents for the Clean Power Plan*, 46 ELR 10190 (Mar. 2016). The issue is somewhat clouded because most rulemakings under §111(d) have addressed the solid waste sector in response to the directive in §129 that standards for certain specified pollutants (including hazardous air pollutants) be promulgated under §111(d), and reflect the emission reductions achieved by the average emissions of the top 12% of existing sources. *See* (1) emissions guidelines for municipal waste combustors, 40 C.F.R. §§60.30b-60.39b, promulgated, 60 Fed. Reg. 65387 (Dec. 19, 1995), reviewed, 71 Fed. Reg. 27324 (May 10, 2006); (2) emissions guidelines for municipal waste landfills, 40 C.F.R. subpts. Cc (§§60.30c-60.36c) & WWW (§§60.750-60.759), promulgated, 61 Fed. Reg. 9905, 9907 (Mar. 12, 1996); (3) emissions guidelines for hospital/medical/infectious waste incinerators, 40 C.F.R. subpt. Ce (§§60.30e-60.39e), promulgated, 62 Fed. Reg. 48348 (Sept. 15, 1997), reviewed, 74 Fed. Reg. 51368 (Oct. 6, 2009); (4) hospital/medical/infectious waste incinerators (*see id.* subpt. Ce); (5) small municipal waste combustion units constructed on or before Aug. 30, 1999 (*see* 40 C.F.R. subpt. BBBB); (6) commercial and industrial solid waste incineration units that commenced construction on or before Nov. 30, 1999 (*see id.* subpt. DDDD); (7) “other” solid waste incineration units that commenced construction on or before Dec. 9, 2004 (*see id.* subpt. FFFF); and (8) sewage sludge incineration units (*see id.* subpt. MMMM). These emission limitations have not been restricted to measures inside the fence, but reflect emissions that have been achieved and include outside-the-fence requirements, such as requirements for implementing recycling or materials separation programs; *see, e.g.*, 40 C.F.R. §§60.35e, 60.55c, 60.1050-60.1105, 60.2899-60.2901. In addition, in addressing the power sector, EPA implemented a cap-and-trade program including mass-based caps reflecting the impact of dispatch switching in the Clean Air Mercury Rule, 70 Fed. Reg. 28606, 28613-16 (May 18, 2005), *invalidated on other grounds*, *New Jersey v. Environmental Prot. Agency*, 517 F.3d 574, 38 ELR 20046 (D.C. Cir. 2008), *cert. denied*, 129 S. Ct. 1308 (2009). At least arguably, the only §111(d) guideline reflecting solely emissions control technology implemented inside the fence is the guideline for sulfuric acid plants, which was the first such guideline promulgated, well before the 1977 or 1990 Amendments to the CAA; *see* 40 C.F.R. subpt. Cd.

the electricity system, and to obtain significant reductions in carbon pollution from existing power plants, the Agency recognized the need to go “beyond the fence” in the CPP.

To accomplish this, the CPP sets uniform emission performance rates for each subcategory of EGUs (e.g., fossil fuel-fired steam electric units and natural gas combined-cycle units) and corresponding CO₂ emission reduction targets for each state.³² These emissions rates are based on the application of three “building blocks”: (1) coal-fired power plant efficiency improvements; (2) displacement of carbon-intensive sources with natural gas combined-cycle units; and (3) increased use of renewable energy.³³ When the CPP is fully in place in 2030, carbon pollution from the power sector is projected to be 32% below 2005 levels.³⁴ These emission reduction goals are based solely on the building blocks, representing EPA’s determination of the emission rate reductions that are achievable based on existing technology (i.e., BSER), with no consideration of the reductions required to achieve the Paris goals or the corresponding needs for willpower or ambition. In fact, the goals depart so significantly from the need for ambition that the majority of analyses have concluded that they will occur even without the Rule.³⁵

States and the owners or operators of the affected EGUs have considerable flexibility in determining how to achieve emission reductions, and may select actions that provide economic, energy, equity, capacity-building, public involvement, and other benefits even though EPA provides no references or guidance on how to do this. Per EPA, this flexibility includes “actions that may occur *off-site* and actions that a *third party* takes pursuant to a commercial relationship with the [EGU] owner/

operator.”³⁶ While this does not preclude approaches that more specifically build willpower using such flexibility, it is not proactive or deliberately empowering in this regard, and the lack of an ambitious goal for emissions reductions beyond business-as-usual makes states less likely to examine such approaches. A more systematic approach could be formulated in the future to enable conditions needed for willpower.

III. Transition to a Willpower- and Ambition-Driven Approach to Climate Law and Policy

EPA’s current strategy for reducing GHG emissions under the CAA, exemplified by the CPP as well as EPA’s regulation of mobile source emissions and its proposed methane strategy, relies on single-sector, rate- and technology-based approaches without attention to issues related to expanded willpower for implementation. This strategy is unlikely to achieve the emission reductions necessary to meet the objectives of the Paris Agreement due to several factors. These factors include limitations of scope on the sectors and reduction mechanisms that may be considered in establishing emission limitations under the provisions on which EPA is relying. In addition, these sections circumscribe both the process of formulating emission reduction goals and the factors that can be considered in a way that limits integration of macroeconomic and energy goals, financial and manpower needs, freedom of policy choice, provision of local tools, and genuine and diverse stakeholder involvement in policy decisions that can result in greater ambition and willpower to achieve greater reductions.

Moreover, this process, involving multiple-rulemaking procedures involving sectors with increasing small contributions to GHG emissions, will be far too slow to achieve the emission reductions necessary to realize the objectives of the Paris Agreement even if the incoming administration is not opposed to further regulation under the CAA. Although further regulation using this approach can be compelled through litigation to enforce mandatory duties under the Act, such litigation will further slow that process. These considerations militate toward adopting alternative approaches better able to generate both the ambition and willpower necessary to meet those goals.

Expanding the range of available policy choices across multiple sectors and integrating economic, energy, and equity priorities in that process is critical in meeting conditions for building willpower and ambition. Although the technology-based approach to emission limitations that EPA is currently pursuing under §111 and Title II of the CAA is a necessary component of a workable carbon reduction strategy, a technology-based approach alone will be insufficient to achieve the necessary GHG reductions in the United States at the scale and within the time frame necessary to prevent dangerous anthropogenic

32. 80 Fed. Reg. 64662, 64663-64 (Oct. 23, 2015).

33. 80 Fed. Reg. 64662, 64745-51 (Oct. 23, 2015). The proposed rule had included a fourth building block for energy efficiency, but this was eliminated by EPA as being outside its regulatory authority under §111(d). 80 Fed. Reg. 64662, 64762 (Oct. 23, 2015).

34. 80 Fed. Reg. 64662, 64665, 64679 (Oct. 23, 2015).

35. A significant percentage of these reductions will occur even without the CPP, largely due to switching “dispatch” to excess capacity in combined-cycle natural gas-fired EGUs driven by the reduction in the price of natural gas resulting from the development of directional drilling (usually mischaracterized as “fracking”), as well as retirements of inefficient, aged coal-fired plants driven in part by the extension of other emissions control requirements to those plants, but to a much greater extent by their inefficiency and natural gas prices. See Susan F. Tierney, *Why Coal Plants Retire: Power Market Fundamentals as of 2012*, ANALYSIS GROUP, INC. (Feb. 16, 2012), available at http://www.analysisgroup.com/uploadedfiles/content/news_and_events/news/2012_tierney_whycoalplantsretire.pdf. Indeed, recent modeling suggests that allowance prices could be zero during much of the interim period and perhaps even in 2030, suggesting that the CPP limits will be no better than “business-as-usual.” See Jennifer Macedonia et al., *Modeling the Evolving Power Sector and Impacts of the Final Clean Power Plan* 33 (Bipartisan Policy Center (June 2016), available at <http://cdn.bipartisanpolicy.org/wp-content/uploads/2016/06/BPC-Energy-Clean-Power-Plan-Modeling.pdf> (“Without banking, prices for [emission rate credits]/allowances would be zero in the interim period.”); similarly, M.J. BRADLEY & ASSOCIATES, LLC, EPA’S CLEAN POWER PLAN: SUMMARY OF IPM MODELING RESULTS WITH ITC/PTC EXTENSION 13 (June 1, 2016), available at http://mjbradley.com/sites/default/files/MJBA_CPP_IPM_Report_III_2016-06-01_final_0.pdf (modeling showing that allowance prices would be zero in 2025 under all four mass-based scenarios considered in that analysis and prices would range from zero to only \$6.05 in 2030).

36. 80 Fed. Reg. 64662, 64761 (Oct. 23, 2015) (emphasis added).

interference with the climate system. This limitation can be overcome by employing other available legal mechanisms that can involve broader, multisector, implementation-driven state-level planning, such as those available to address international pollution under §115 or to achieve a national ambient air quality standard (NAAQS) under §108 of the CAA.

First, the current reliance on provisions that base emission limitations, and therefore reduction goals, exclusively on what can be achieved by certain technologies results in standards unlikely to achieve the emission reduction trajectory across all sectors necessary to meet the emission reduction goal of the UNFCCC and the Paris Agreement, or to do so in a manner that enables willpower, unless by coincidence. This is readily evident from comparison of the 2030 emission reduction goals of the CPP with the reductions necessary for the utility sector to achieve that sector's proportionate share of reductions necessary to limit temperature increases to 2°C. After implementation of the CPP, emissions from the utility sector will have been reduced by only 9.6% from their 1990 levels, so that between 1990 and 2030, only 12% of the required reductions will have been achieved, and the utility sector will need to reduce its emissions by 78% from 2030 levels to achieve just its proportionate share of the reductions that will be required economywide.³⁷

Second, formulating emission reduction goals based solely on reductions that can be achieved at a projected cost based on a limited set of technological options usually results in an underestimation of what is achievable, limiting the necessary ambition and failing to capture potential willpower from new benefits. For example, to withstand judicial review, EPA will often use "conservative" estimates that will overestimate costs, underestimate what is achievable, and underestimate quantifiable benefits. By way of example, while new source performance standards established under §111(b) of the CAA are intended to be technology-forcing, EPA's 1,000 pounds of CO₂ per megawatt hour (lbs. CO₂/MWh) standard for new combined-cycle power plants³⁸ will allow higher emissions than the levels already capable of being achieved. One of the nation's largest utilities found it can reliably achieve 950 lbs. CO₂/MWh,³⁹ and California's existing fleet of natural gas- and oil-fired plants (both combined-cycle and steam electric) is achieving an 870 lbs. CO₂/MWh emissions rate.⁴⁰

Third, an approach that relies solely on technology-based standards established for individual sectors will not consider intersectoral effects and fails to capture many categories of emissions altogether. The number of separate rulemakings required under such an approach will slow the process down and prevent emission reductions within the time frame necessary to achieve the objectives of the Paris Agreement. This approach will therefore overlook many of the strategies most likely to build willpower and ambition. For example, buildings are responsible for roughly 40% of GHG emissions in the United States, half of which are direct emissions from combustion of fossil fuels for heating and cooling and the other half indirect emissions caused by electricity used in the buildings. Many, if not most, of the direct emissions from buildings will not be subject to technology-based emission limitations under §111 of the CAA, because they arise from sources not regulated under that section.⁴¹ Many energy conservation and efficiency measures for buildings have short payback periods and save money. These will not be captured under the current approach.⁴²

Fourth, the CPP so narrowly defines "leakage" that it could allow considerable leakage that has the potential to partially or wholly eliminate the reductions it requires. It defines leakage as being limited to the shift of electricity dispatch from existing regulated EGUs to unregulated new units within a state adopting a mass-based approach. This excludes: (1) leakage that occurs if a nuclear or other non-emitting facility retires and is replaced by a new fossil fuel-fired unit⁴³; (2) interstate leakage between states that cap new and existing units, such as the Regional Greenhouse Gas Initiative (RGGI) states and states that adopt a rate-based approach or that do not include new units in a cap; and (3) leakage from regulated units to unregulated units such as single-cycle turbines or smaller electric generating units. This allows for potentially perverse effects that could increase total emissions even while the rate of the narrowly regulated sector decreases.

Fifth, EPA's current reliance on technology-based standards has resulted in the Agency establishing limits expressed as an emissions rate or emissions intensity with-

AIR ACT SECTION 111(D), at 12 (2016), *available at* <http://www.arb.ca.gov/cc/powerplants/meetings/09222016/proposedplan.pdf>.

41. See 40 C.F.R. pt. 60.

42. To a certain extent, this can be attributed to what might be considered EPA's unduly constrained approach to its authority. For example, the Regional Greenhouse Gas Initiative (RGGI) program allows the creation of offset credits from "[r]eduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency." These reductions are not considered in establishing the CPP emission reduction guidelines and may not be used for compliance with the CPP. Although some of these cost-effective reductions might later be captured by standards for industrial, commercial, and very large residential boilers regulated under a §111 standard, none of the reductions in homes would be considered.

43. EPA has not included new sources in its model mass-based rule because it has changed its interpretation of §111 reflected in the Clean Air Mercury Rule, 70 Fed. Reg. 28606 (May 18, 2005), and now believes that the CAA does not authorize inclusion of new source regulation under §111(b) in a cap established for existing sources under §111(d), despite the interconnected nature of the electricity market. Final CPP, 80 Fed. Reg. 64662, 64729-30 (Oct. 23, 2015).

37. EPA's Clean Power Plan IPM model input shows that electricity sector emissions will be 1645.6 million metric tons in 2030, while the United States Greenhouse Gas Emissions Inventory shows that emissions from that sector in 1990 were 1,820.8 million metric tons. U.S. EPA, DRAFT INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2012 (2014) at 3-12, Table 3-9. Eighty percent of the 1990 emissions would be 364.2 million metric tons, and 364.2 is 78% of 1645.6.

38. 40 C.F.R. pt. 60, subpt. TTTT, tbl. 2.

39. See COMMENTS OF EXELON CORPORATION ON U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FROM NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS 3-5 (2014), *available at* <http://www.regulations.gov/#/documentDetail;D=EPA-HQ-OAR-2013-0495-9406>.

40. STATE OF CALIFORNIA AIR RESOURCES BOARD, CALIFORNIA'S PROPOSED COMPLIANCE PLAN FOR THE FEDERAL CLEAN POWER PLAN UNDER CLEAN

out a uniform limit or “cap” on the mass of emissions. A mass-based approach that places a declining cap on emissions is necessary to put the nation on a path to peak emission reduction and carbon neutrality. This is most evident with respect to mobile source emissions, where vehicle emissions increased by 17% between 1990 and 2014 despite significant dramatic reductions in the emissions rate (i.e., miles per gallon).⁴⁴

Sixth, the reliance on the technology-based approach does not explicitly encourage or require multi-objective approaches that are aligned with national policy goals, such as economic and national security goals, and matched with investment and manpower capacities, policy development and transition tools, or public involvement procedures needed to build willpower for high-priority actions. As a result, the level of effort built into the current approach is low to avoid conflict with such priorities and needs rather than integrating them.

The current approach can lead to weak macroeconomic and energy security performance in comparison to multi-objective approaches directed to more ambitious goals that are enabled by comprehensive, multisector, stakeholder, and capacity-driven planning with flexible instruments that can be molded for economic development. Although EPA's current approach gives states broad flexibility in determining how to meet the goals of the CPP, the foregoing limitations make it unlikely that states can or will establish processes that will build willpower and ambition, but instead will follow a minimum compliance approach. A technology-based approach constrains both the incentive and the ability to design plans that improve macroeconomic performance that is essential to building the political willpower necessary to reduce GHG emissions and minimize political resistance.

IV. Pathways for Multi-Objective, Implementation-Driven Law and Policy

A multi-objective, multisector, participatory, capacity-driven approach focused on emission reduction goals aligned with the objectives of the Paris Agreement will be preferable to an approach relying solely on technology-based, sectoral standards because it enables broader choice in the selection, design, and integration of policy options. As discussed in our initial Comment, state-level planning efforts based on a multi-objective approach resulted in the selection of policy objectives across all sectors, thereby placing the states on a path necessary to build willpower and ambition to achieve the emission reductions that could limit temperature increases to 2°C.⁴⁵

Many, if not most, of these plans have not been fully implemented for a variety of reasons, including the lack of a sufficiently ambitious federal floor or changes in state administrations. However, the experiences of the states where these recommendations have been partially or wholly implemented demonstrate that these processes can result in programs that reduce GHG emissions on a more ambitious pathway than contemplated by the current federal approach, while improving macroeconomic and other performance needed to build willpower for greater emission reductions. Although the actual process of transforming policy into legislative practice is, as Otto von Bismarck famously stated, much akin to the process of making sausage, the experience of a wide range of U.S. states over the past decade directed at targets aligned with long-term objectives can build a strong new willpower for action.

For instance, as a condition for entrance into its regional program, each of the nine RGGI states prepared a state climate plan using a multi-objective, stakeholder approach designed to put the states on a path consistent with the goal later adopted in the Paris Agreement. Each of the state plans included a cap-and-trade program as one of the policies to be integrated with measures in all sectors of the state's economy. Although limited to a cap-and-trade program for the utility sector, the RGGI program grew out of a broader climate action plan adopted by the northeastern U.S. governors and eastern Canadian premiers (as well as state-level plans in Connecticut, Maine, New York, Rhode Island, and Vermont) that contemplated an extensive multisectoral approach and an expanded trading program.⁴⁶ Consistent with that broader approach, the RGGI memorandum of understanding requires the implementation of complementary energy policies, such as renewable portfolio standards (RPS), and the devotion of 25% of allowances or allowance sale revenues to consumer relief or strategic energy purposes.⁴⁷

Analyses of the macroeconomic impacts of the RGGI have shown net expansion of jobs and economic growth and the potential for low-carbon actions to be aligned with economic needs.⁴⁸ The stimulative effect of the RGGI program arises from the fact that auction revenues from the sale of allowances for a cap-and-trade program covering

44. U.S. EPA, *Sources of Greenhouse Gas Emissions—Transportation Sector Emissions*, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#transportation> (last visited Dec. 15, 2016).

45. See Peterson et al. *supra* note 1; see also John C. Dernbach et al., *Making the States Full Partners in a National Climate Change Effort: A Necessary Element for Sustainable Economic Development*, 40 ELR 10597 (June 2010); Robert B. McKinstry Jr. et al., *The New Climate World: Achieving Economic Efficiency in a Federal System for Greenhouse Gas Control Through State*

Planning Combined With Federal Programs, 34 N.C. J. INT'L L. & COM. REG. 102 (2009); Thomas D. Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy in the United States That Fully Integrates Levels of Government and Economic Sectors*, 26 VA. ENVTL. L.J. 219 (2008); Robert B. McKinstry Jr. et al., *Federal Climate Change Legislation as if the States Matter*, 22 NAT. RESOURCES & ENV'T 3 (2008); Robert B. McKinstry Jr. & Thomas D. Peterson, *The Implications of the New “Old” Federalism in Climate Change Legislation: How to Function in a Global Marketplace When States Take the Lead*, 20 McGEORGE GLOBAL BUS. & DEV. J. 61 (2007).

46. See Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP) Resolution 26-4, Resolution Concerning Energy and the Environment, Adopting Climate Change Action Plan 2001 (Aug. 2001).

47. RGGI Memorandum of Understanding ¶¶ 2G(1), 7 (Dec. 20, 2005), available at https://www.rggi.org/docs/mou_final_12_20_05.pdf.

48. PAUL J. HIBBARD ET AL., *THE ECONOMIC IMPACTS OF THE REGIONAL GREENHOUSE GAS INITIATIVE ON NINE NORTHEAST AND MID-ATLANTIC STATES: REVIEW OF RGGI'S SECOND THREE-YEAR COMPLIANCE PERIOD (2012-2014)* 5 (Analysis Group 2015), available at http://www.eenews.net/assets/2015/07/13/document_pm_04.pdf.

utilities are applied to a variety of other state priorities, including energy efficiency and alternative energy, low-income rate relief, and even state deficit reduction.⁴⁹ The RGGI states have continued to initiate additional supplemental policies, such as New York's implementation of a zero-emissions credit system,⁵⁰ to support its RPS and to reduce GHG emissions and advance economic interests.

California's program for reducing GHG emissions, which probably represents the most ambitious and successful state program, ultimately arose out of multi-objective, bottom-up stakeholder processes designed to achieve an 80% GHG emission reduction from 1990 levels by 2050. In response to early feedback from the public, California chose to develop its climate policies with a bottom-up, multisector, stakeholder-driven planning process to achieve aggressive climate targets established by the governor and consistent with the Paris goals. That process resulted in the initiation of policies across many sectors, ultimately leading to the California Global Warming Solutions Act,⁵¹ which established those goals legislatively and resulted in continued planning both at the state and local levels.

The California climate law and planning process has built the ambition, willpower, and capacity to put the state on a path to achieve the emission reductions that will stabilize temperatures consistent with the Paris Agreement. The state policies include mobile source standards adopted by other states and ultimately the federal government, an economywide cap-and-trade program where allowances are distributed by auction with a price floor and revenues are reinvested, a fuel carbon standard, an electricity carbon standard, and recently the first standard limiting methane emissions from the dairy industry. The establishment of an aggressive goal, California's relative insulation from leakage due to its isolated electric grid and energy system, and the size of the state's economy all helped support the ambi-

tion and willpower necessary to avoid the constraining effect of the lack of a meaningful federal floor.

V. Legal Authority for Approaches That Can Build Willpower and Ambition

A. Authority and Obligation Under the CAA

EPA and others considering the challenge of controlling GHGs have long recognized that the CAA provides broader policy tools that can support bottom-up planning for an economywide, multisectoral approach to reducing GHGs. Properly used, these also can build and support the willpower and ambition necessary to achieve the Paris Agreement objectives. In particular, the multisectoral state planning approach authorized under §110 of the CAA⁵² might be triggered and employed to establish goals consistent with the Paris Agreement in the form of either NAAQS under §109 of the CAA,⁵³ or achieving international goals embodied in the UNFCCC and the Paris Agreement under §115 of the CAA.⁵⁴ This broad scope of emission coverage could be combined with broad-scope objectives (including economic and energy priorities) and other aspects of willpower as previously discussed. States have exercised these options to varying degrees thus far, with significant success where used.

EPA explored both §109 and §115 approaches in its advance notice of proposed rulemaking (ANPR) regarding regulation of GHGs under the CAA.⁵⁵ A growing number of articles have suggested that regulation under one of these other authorities will ultimately be preferable and even legally required,⁵⁶ and petitions seeking to have EPA initiate rulemaking and issue a state implementation plan (SIP) call under these authorities have been pending

49. The Analysis Group, a consulting firm, has conducted two macroeconomic analyses of the macroeconomic impacts of the RGGI program on the economies of the participating states, analyzing the first and second three-year periods, respectively. In the second analysis, the authors found that "[s]imilar to our findings with respect to the first three years of the RGGI program, its implementation in the second three-year period generates \$1.3 billion in net economic benefits across the region." HIBBARD ET AL., *supra* note 48, at 5. The authors further concluded that:

[T]he net effect is that the second three years of RGGI leads to nearly 14,200 new job years, with each of the nine states showing net job additions. This is on top of what we found for the first three years (2009-2011) of the program: 16,000 job-years. Jobs related to RGGI activities are located around the economy, with examples including engineers who perform efficiency audits; workers who install energy efficiency measures in commercial buildings; or staff performing teacher training on energy issues.

Id. at 10.

50. An RPS supports the expansion of certain forms of renewable energy, but most RPS programs exclude large-scale hydroelectric and nuclear energy, which are crucial for reducing GHG emissions and protecting existing facilities and jobs. New York adopted the broader Clean Energy Standard that will preserve and expand all forms of non-emitting generation to achieve the goal of 50% non-emitting generation by 2030. Press Release, Governor Andrew M. Cuomo, Governor Cuomo Announces Establishment of Clean Energy Standard That Mandates 50 Percent Renewables by 2030 (Aug. 1, 2016), [available at https://www.governor.ny.gov/news/governor-cuomo-announces-establishment-clean-energy-standard-mandates-50-percent-renewables](https://www.governor.ny.gov/news/governor-cuomo-announces-establishment-clean-energy-standard-mandates-50-percent-renewables).

51. CAL. HEALTH & SAFETY CODE §§38500 et seq.

52. 42 U.S.C. §7410.

53. *Id.* §7409.

54. *Id.* §7415.

55. GHG ANPR, 73 Fed. Reg. 44354, 44477-84 (July 30, 2008); *see also* Robert B. McKinstry Jr., *Obama's EPA Memorandum Follows the Law, Does Not Make It*, 30 NAT. GAS & ELECTRICITY 1-9 (2013); Robert B. McKinstry Jr., *The Clean Air Act: A Suitable Tool for Addressing the Challenges of Climate Change*, 41 ELR 10301 (Apr. 2011).

56. In the wake of the Paris Agreement, a group of prominent scholars suggested utilizing §115 authority to achieve this result. MICHAEL BURGER ET AL., LEGAL PATHWAYS TO REDUCING GREENHOUSE GAS EMISSIONS UNDER SECTION 115 OF THE CLEAN AIR ACT (Sabin Center for Climate Change Law et al. 2016) (LEGAL PATHWAYS), *available at* https://web.law.columbia.edu/sites/default/files/microsites/climate-change/executive_summary_-_legal_pathways_to_reducing_ghgs_under_cca_section_115.pdf. Before Paris had added definition to the goal of the UNFCCC, the authors had suggested that this result could be achieved by listing GHGs under §108 of the CAA and establishing NAAQS, as occurred in the case of lead, which is the only entirely new pollutant from widespread sources for which an endangerment finding was made under §202 of the CAA. *See* Robert B. McKinstry Jr. et al., *Race to Regulation of Greenhouse Gases Accelerates Without Clear Destination*, 133 World Climate Change Rep. (BNA) (July 12, 2010); Dernbach et al., *Making the States Full Partners in a National Climate Change Effort*, *supra* note 45; McKinstry Jr. et al., *The New Climate World*, *supra* note 45; Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy*, *supra* note 45; McKinstry Jr. et al., *Federal Climate Change Legislation*, *supra* note 45; McKinstry Jr. & Peterson, *The Implications of the New "Old" Federalism in Climate Change Legislation*, *supra* note 45.

for several years.⁵⁷ However, EPA has not acted or even requested comment on these petitions, relying instead on technology-based standards under §§111 and 202 of the Act, and other authority that neither addresses the issue comprehensively nor establishes goals consistent with achieving the objectives of the Paris Agreement.

Sections 111 and 202 could be deployed more broadly. EPA's endangerment finding will require a significant expansion of the sources regulated under §111 and §202 to include virtually all categories of stationary and mobile sources, including nonroad engines and vehicles regulated under §213, as long as they rely on fossil fuels.⁵⁸ While these technology-based standards will be necessary, they are likely to be insufficient elements of the more comprehensive §110 process triggered by §§109 and 115.⁵⁹ Twenty-one percent of the U.S. GHGs arise from agriculture (9%) and commercial and residential heating and cooling (12%),⁶⁰ most of which will not be reached by technology-based standards under §111 or Title II. Thus, emissions from other sectors would need to drop to close to zero by 2050 to achieve an 80% GHG reduction without regulation of these sectors—and carbon neutrality could not be achieved unless they are regulated. Moreover, if EPA relies on rate-based standards that do not consider intersectoral effects and allow new or expanded sources to emit additional GHGs without offsetting reductions elsewhere, the existing technology-based standards will allow only limited reductions in the emissions attributable to electricity (30%), transportation (26%), and industrial sources (21%).⁶¹

For example, under the CPP, if transportation and industrial sources switch from fossil fuel use to electrical use, the increased demand can be satisfied by new combined-cycle natural gas-fired plants whose emissions are not capped. This type of intersectoral shift in emissions will achieve some reduction in emissions, but by no means be sufficient to achieve an 80% reduction by 2050, typically associated with carbon neutrality, before the end of the century. Indeed, the rate-based approach of the CPP allows retiring existing nuclear and renewable energy generation plants to be replaced by new fossil fuel-fired plants, so that emissions can increase. Moreover, unless EPA continually adjusts its rate-based emissions and creates lower emissions standards, technological improvements can result in increasing emissions under rate-based regulations.⁶²

The broader planning process encompassed by SIPs described in §110 of the CAA may provide a better means of addressing intersectoral effects based on emission reduction goals provided by NAAQS, if EPA proceeds under §§108 and 109 of the CAA, or the goals defined by the Paris Agreement, if EPA proceeds under §115 of the CAA. Moreover, these processes will be aimed at goals consistent with what will be required to achieve the Paris reductions, and will support both the willpower and the state capacity necessary to meet them. Because SIPs are formulated by states in the first instance, the SIP mechanism also provides a means to encourage the type of local stakeholder involvement that can best lead to the identification of emission reduction strategies that promote economic development and job creation, and further build the ambition and willpower necessary to keep temperature increases below the thresholds articulated in the Paris Agreement.⁶³

Both pathways—NAAQS and §115—must ultimately lead to the same goal of reducing emissions to achieve a balance between emissions and sequestration of carbon in long-term sinks within a time frame sufficient to keep temperatures below the thresholds specified in the Paris Agreement. To get there from here, they can and must be pursued in a manner that builds willpower. We have previously suggested that the CAA is sufficiently flexible to allow use of the NAAQS mechanism to prevent dangerous anthropogenic interference with the climate system within the meaning of the UNFCCC.⁶⁴ Section 108 creates a mandatory duty requiring that EPA list and promulgate NAAQS for “each air pollutant” whose emissions (1) meet the same endangerment standard triggering regulation under §202, (2) arise “from numerous or diverse mobile or stationary sources,” and (3) “for which air quality criteria had not been issued before December 31, 1970 but for which [EPA] plans to issue air quality criteria under this section.”⁶⁵ As a result, this mechanism may have merit as both a legal and political pathway for goal attainment.

In the case of lead, which is the only other entirely “new” pollutant that EPA regulated under §202 of the CAA based on an endangerment finding, EPA was ordered to list lead and to establish NAAQS based on the endangerment finding and the undisputed fact that lead arose from multiple sources.⁶⁶ EPA's endangerment finding for GHGs,⁶⁷ cou-

57. 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); CENTER FOR BIOLOGICAL DIVERSITY & 350.ORG, PETITION TO ESTABLISH NATIONAL POLLUTION LIMITS FOR GREENHOUSE GASES PURSUANT TO THE CLEAN AIR ACT (Dec. 2, 2009).

58. Robert B. McKinstry Jr. & Ronald M. Varum, *State Implementation of the Clean Power Plan: Why It Matters to Industries Outside the Power Sector*, 45 ELR 11008 (Nov. 2015).

59. See McKinstry Jr., *The Clean Air Act*, *supra* note 55.

60. U.S. EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2014 (2016) (EPA 430-R-16-002).

61. *Id.*

62. JOHN HOROWITZ & JOSHUA LINN, THE ENVIRONMENTAL EFFECTS OF CLEAN ENERGY INNOVATIONS UNDER RATE-BASED REGULATION (Resources for the

Future 2015) (RFF DP 15-42).

63. Dernbach et al., *Making the States Full Partners in a National Climate Change Effort*, *supra* note 45; McKinstry Jr. et al., *The New Climate World*, *supra* note 45; Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy*, *supra* note 45.

64. *Id.*

65. 42 U.S.C. §7408(a)(1)(C).

66. Natural Res. Def. Council v. Train, 545 F.2d 320, 7 ELR 20004 (2d Cir. 1976).

67. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule, 74 Fed. Reg. 66496 (Dec. 15, 2009) (Endangerment Finding), *aff'd*, Coalition for Responsible Regulation, Inc. v. Environmental Prot. Agency, 684 F.3d 102, 42 ELR 20141 (D.C. Cir. 2012), *aff'd in part and rev'd in part on other grounds sub nom.* Utility Air Regulatory Group v. Environmental Prot. Agency, 134 S. Ct. 2427, 44 ELR 20132 (2014).

pled with its regulation of light-duty vehicles,⁶⁸ heavy-duty vehicles,⁶⁹ the CPP, its intent to regulate methane from multiple sources,⁷⁰ and its establishment of guidelines for establishing case-by-case emissions limits under the new source review program,⁷¹ make the case for listing GHGs even more compelling than the case presented for lead.⁷²

Listing GHGs and establishing NAAQS under §§108 and 109 therefore provide a mechanism to require states to develop plans implementing economywide emission reductions aimed at achieving the Paris goals in a manner that specifically builds willpower and the legal means for compelling that result. But there are a number of considerations that suggest that achieving the same result under §115 would be preferable to the establishment of a GHG NAAQS. First, the process for establishing NAAQS is time-consuming, and potentially provides more opportunities for appeals that may delay the process than would regulation under §115.⁷³ Second, listing a pollutant under §108 would remove EPA's authority to establish technology-based standards for existing sources under §111(d),⁷⁴ while regulation under §115 would not displace the Agency's ability to promulgate technology-based emissions guidelines while also pursuing a broader approach. Finally, because emission reduction targets under §115 arise directly through the international process, regulating under §115 would reduce the difficulties of determining

GHG atmospheric concentrations that prevent dangerous anthropogenic interference with the climate system, translating that into required emission reductions, and determining the U.S. share of those emission reductions.

Using §115 authority to trigger bottom-up state planning under §110 would also avoid some of the timing problems that might be created by establishing a NAAQS. For example, if a primary NAAQS is established at a concentration below atmospheric levels, SIPs must achieve compliance within three years.⁷⁵ The timing of emission reductions under §115 could readily be made consistent with a series of five-year targets under the Paris Agreement leading to the 80% reduction by 2050 necessary to achieve carbon neutrality by the second half of the century.

The conditions for triggering a mandatory duty under §115 exist. Using the mandatory "shall," §115 requires EPA to issue a SIP call for any pollutant meeting the CAA's endangerment standard in any foreign country that EPA "determines 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" §115.⁷⁶ The first element has already been satisfied by EPA's endangerment finding, where the Administrator specifically found that the emissions of GHGs endangered health and welfare in foreign nations and that these impacts, in turn, endangered health and welfare in the United States.⁷⁷

The reciprocity prerequisite is likely satisfied by the international commitments in the UNFCCC as further defined in the Paris Agreement. The Parties to the Agreement are committed to maintaining temperature increases to below 2°C, with a goal of limiting those increases to 1.5°C. Moreover, although the immediate commitments to emission reductions are voluntary in that the NDCs are initially voluntary, once those commitments are made, they become mandatory and all nations are committed to achieving carbon neutrality during the second half of the century.⁷⁸ Moreover, they must be updated every five years.

Section 115 creates a mandatory duty, providing that whenever the Administrator received reports providing "reason to believe" that air emissions in the United States "cause or contribute to air pollution which may reason-

68. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25324 (May 7, 2010); 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, Final Rule, 77 Fed. Reg. 62624 (Oct. 15, 2012).

69. Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles; Final Rule, 76 Fed. Reg. 57106 (Sept. 15, 2011); Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, 81 Fed. Reg. 73478 (Oct. 25, 2016).

70. Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35824 (June 3, 2016); 2016 Control Techniques Guidelines for the Oil and Natural Gas Industry, *available at* <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/2016-control-techniques-guidelines-oil-and>.

71. See U.S. EPA, GHG Control Measures White Papers, *available at* <https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases>.

72. In *Natural Res. Def. Council*, 545 F.2d at 325, EPA had not established emissions guidelines, had not regulated additional sources, and had expressed no intention to establish emissions guidelines, but the court held that the additional language in §108 providing "but for which he plans to issue air quality criteria under this section" does not change the mandatory duty to list a pollutant meeting the endangerment standard and arising from diverse sources. Although there appears to be a mandatory duty to list at some point, §108 does not establish a deadline for doing so.

73. The §115 process could potentially be initiated by way of a rulemaking for a SIP call requiring states to submit plans for achieving emission reductions necessary to put them on the path required to achieve the now defined objectives of the UNFCCC. Although the §115 SIP call could be appealed, the NAAQS approach would require listing under §108, 42 U.S.C. §7408, which could be appealed, *id.* §7607(b), the establishment of air quality criteria and emissions guidelines and the promulgation of a NAAQS, which must occur within 12 months of listing, *id.* §7408, but can also be appealed, *id.* §7607(b), and then the issuance of a SIP call.

74. 42 U.S.C. §7411(d)(1)(A)(i). There is nothing in the statute that suggests that a decision to list would remove the authority with respect to regulations that had previously been promulgated, such as the CPP. However, a listing would preclude the establishment of technology-based standards for other source categories and might create questions relating to EPA's ability to modify or promulgate a replacement of the CPP should it be reversed in whole or in part.

75. This issue is less of a problem than many have suggested since the concentration necessary to meet the requirements of the Paris Agreement and the UNFCCC will likely be higher than those existing, but would still require a SIP call requiring emission reductions as part of a maintenance SIP. Nevertheless, given the pattern of litigation by the states and other interests opposing meaningful regulation of GHGs, one could expect that challenges would be raised to an attempt to issue a SIP call to maintain NAAQS that would not be violated for many years in the future.

76. 42 U.S.C. §7415.

77. Endangerment Finding, 74 Fed. Reg. 66496, 66514 (Dec. 15, 2009). Although the administrator stated that she considered international health and welfare impacts solely since these impacts had adverse impacts domestically, the finding that GHGs would endanger health and welfare internationally was a prerequisite to the finding regarding domestic impacts. For that reason, the endangerment finding necessary to trigger regulation under §115 has been made. See also BURGER ET AL., *supra* note 56, at 16-19 (concluding that endangerment standard has been satisfied).

78. For an extended discussion of the reciprocity requirement, see BURGER ET AL., *supra* note 56, at 20-43.

ably be anticipated to endanger public health or welfare in a foreign country,” the Administrator “shall give formal notification thereof” to the governor of the state where the emissions originate, which would include every state and territory in the United States.⁷⁹ That notice is deemed to be a finding that any state’s SIP is inadequate and specifically triggers a mandatory duty for the state to modify its SIP to “eliminate the endangerment.”⁸⁰ The finding also triggers the CAA’s “Good Neighbor” provision,⁸¹ under which EPA has issued federal implementation plans (FIPs) establishing cap-and-trade programs to address interstate air pollution by conventional pollutants.⁸² Because the Administrator’s duty to issue a SIP call is mandatory, it can potentially be enforced against EPA by way of a citizen suit.⁸³ Hence, it could be a legal forcing mechanism that also opens the door to approaches that enable willpower.

The case for regulation of GHGs under §115 of the CAA is more compelling than that presented in the only other instance where §115 has been invoked, which arose in response to the actions by Canada and downwind states to compel regulation of acid rain precursors under a 1980 memorandum of intent signed by the United States and Canada.⁸⁴ In response to that memorandum, EPA Administrator Douglas Costle, in a letter, determined that both the endangerment and reciprocity requirements were satisfied. However, when the new Reagan Administration refused to act further, the Costle determinations were declared to be invalid because they were not preceded by notice and comment.⁸⁵ The D.C. Circuit later upheld the Reagan Administration’s rejection of a rulemaking petition by Ontario and environmental groups, based on the Agency’s representation that it wished to address the endangerment, reciprocity, and SIP revisions in a single proceeding and that it did not have sufficient information to attribute emissions to individual states.⁸⁶

In the case of GHG emissions, EPA has already made an endangerment finding after notice and comment with respect to the international effects of GHG emissions, that finding has withstood judicial review, and the Agency has compiled detailed information on state-by-state emissions that it is using in ongoing rulemakings. Unlike the case of acid rain precursors, the specific origin of the GHG emissions is irrelevant; only the relative amounts of emissions are relevant and the Agency has full information on amounts. Thus, although EPA would need to proceed through notice-and-comment rulemaking to initiate a SIP

call under §115, it appears that there is little basis for rejecting the pending rulemaking petitions. Moreover, these facts support a determination that EPA has a mandatory duty to act under §115 that might be enforced by way of a citizen suit.

Because §115 triggers the requirement for submission of a SIP under §110, it authorizes states to consider the full panoply of options available to limit emissions and, in the process, to address other objectives critical to expanded willpower. These include, for instance, emission limitations that may involve fees, marketable permits, and auctions of emissions rights⁸⁷ and the associated revenue reinvestment. They also include indirect source control programs reaching land use and other transportation control measures that may not be regulated by EPA under other sections of the Act.⁸⁸ The §110 process itself provides an opportunity to engage in the type of multi-objective, bottom-up, stakeholder and feasibility-driven processes that have been shown to build ambition and willpower in state planning exercises. Moreover, where a state fails to submit an adequate SIP, EPA is further authorized and required to impose a FIP, which may include emission limitations in the form of “economic incentives, such as marketable permits or auctions of emissions allowances,” but may not include other measures available to states, such as emissions fees, indirect source control measures, or other types of incentives.⁸⁹

This structure is important because it creates an open opportunity to address willpower needs through an appropriate set of incentives that remove the barriers to state action, and can motivate states to investigate the full range of measures that can achieve emission reductions in the manner most conducive to economic growth, investment flow, manpower needs, public involvement, and other critical elements of willpower expansion. The mandatory duty to impose a FIP allows states that take early action to do so without the risk of leakage to other states, or states otherwise attracting business by means of a race to the bottom.⁹⁰ Likewise, the more limited options available to EPA in imposing a FIP creates an incentive for states to work with stakeholders to employ a wider range of options that will minimize costs and maximize economic benefits and other public values.

79. 42 U.S.C. §7415(a).

80. *Id.* §§7415(b), 7410(a)(2)(H)(ii).

81. *Id.* §7410(a)(2)(D)(ii).

82. See *Environmental Prot. Agency v. EME Homer City Generation*, 134 S. Ct. 1584, 44 ELR 20094 (2014) (affirming EPA’s use of cost-effectiveness in a cap-and-trade program to allocate responsibility for emission reductions required to achieve NAAQS under the Good Neighbor provision).

83. 42 U.S.C. §7604(a)(2).

84. *Transboundary Air Pollution*, Aug. 5, 1980, Can.-U.S., 32 U.S.T. 2521.

85. *Thomas v. New York*, 802 F.2d 1443, 16 ELR 20925 (D.C. Cir. 1986).

86. *Her Majesty the Queen in Right of Ontario v. Environmental Prot. Agency*, 912 F.2d 1525, 20 ELR 21354 (D.C. Cir. 1990). This litigation was ultimately pretermitted by congressional action promulgating the acid rain provisions of the CAA in the 1990 Amendments. 42 U.S.C. §§7651-7651o.

87. *Id.* §7410(a)(2)(A).

88. *Id.* §7410(a)(5).

89. *Id.* §7410(c), 7602(y) (defining “federal implementation plan”).

90. The FIPs at issue in *EME Homer City* were imposed in response to actions by states and cities that had undertaken measures to implement more stringent emission control measures that were thwarted by interstate air pollution originating in the states challenging EPA’s FIP. Likewise, California and many RGGI states were petitioners in *Massachusetts v. Environmental Prot. Agency*, 549 U.S. 497, 37 ELR 20075 (2007), and have since intervened to support EPA in its actions to regulate GHG emissions, including litigation defending the endangerment finding, *Coalition for Responsible Regulation, Inc. v. Environmental Prot. Agency*, 684 F.3d 102, 42 ELR 20141 (D.C. Cir. 2012), and the litigation over the CPP.

B. Authority and Obligation Under Other Authorities

The statutory prerequisites for triggering state-level bottom-up, economywide planning and the statutory means to compel this result under the CAA appear to be clear and provide a straightforward pathway toward that result. Evolving international law may also support the argument that EPA has a mandatory duty to limit GHGs under the CAA and in accordance with a schedule under which it would achieve carbon neutrality during the last half of this century. International law also could compel similar results for other nations, as well as states and other subnational units. A series of lawsuits brought by the Save the Children campaign under international law and a variety of constitutional claims presents a different route to compel broad bottom-up approaches to achieve the goals of the Paris Agreement.

In *Urgenda Foundation/State of the Netherlands*,⁹¹ the Urgenda Foundation brought a tort action under the Dutch Civil Code on behalf of itself and 886 individuals, claiming among other things that “the State is in breach of its duty of care for taking insufficient measures to prevent dangerous climate change.” Plaintiffs sought to compel the Netherlands to adopt policies calling for a 25-40% reduction in GHGs by 2020, an amount exceeding that nation’s roughly 17% reduction commitment. The court ordered the State to reduce its emissions by 2020 by at least 25%, based on the court’s conclusion that it was the least that was necessary, consistent with the obligations of developed nations under the UNFCCC to limit global temperatures to an increase of no more than 2°C, even before the Paris Agreement. That holding was based primarily on the UNFCCC, non-binding determinations of the Parties to the UNFCCC, and the scientific conclusions of the Intergovernmental Panel on Climate Change (IPCC).⁹²

Although the Dutch court found that obligations under the UNFCCC were obligations owed to other States rather

than private parties such as the plaintiffs, it held specifically that the Dutch State had an obligation to apply the UNFCCC’s requirement in the construction of its own laws to achieve the 25% reduction, as follows:

This does not affect the [sic] fact that a state can be supposed to want to meet its international-law obligations. From this it follows that an international-law standard—a statutory provision or an unwritten legal standard—may not be explained or applied in a manner which would mean that the state in question has violated an international-law obligation, unless no other interpretation or application is possible. This is a generally acknowledged rule in the legal system. This means that when applying and interpreting national-law open standards and concepts, including social propriety, reasonableness and propriety, the general interest or certain legal principles, the court takes account of such international-law obligations. This way, these obligations have a “reflex effect” in national law.⁹³

The court also noted throughout its opinion that further reductions were required in the future, noting the Dutch government’s commitment to reduce emissions by 40% by 2030.

Urgenda may be the first of many actions compelling economywide approaches to achieve the emission reductions necessary to achieve the objectives of the Paris Agreement.⁹⁴ This also could open the door to the use of more strategic and systematic approaches that build willpower in a specific manner as they also ratchet up ambition; this could be done in parallel. At a minimum, *Urgenda* lends further credence to the argument that the reciprocity requirement is met at least by the Netherlands, and, given the fact that GHGs present a global risk, there ought not be a sound argument against invoking §115 because some nations may not provide reciprocity. There are also sound arguments that *Urgenda*’s holding that the Netherlands has an obligation to interpret its own laws to achieve a minimum 25% reduction by 2025 is equally applicable to the U.S. application of its laws and that conclusion is strengthened by the Paris Agreement.

Like the Netherlands, the United States has ratified and is an Annex I Party to the UNFCCC. The United States was also a Party to the series of non-binding resolutions at the COPs on which the Dutch court relied. The Paris Agreement, which has been signed by the United States, incorporates and extends those agreements. The United States has stated that it “intends to achieve an economywide target of reducing its GHGs by 26-28 per cent below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28%,” and to increase reductions beyond that pace so as to achieve an 80% reduction by 2050, which is consistent with the Dutch court’s finding

91. *Urgenda Found. v. The Netherlands*, C/09/456689, HA ZA 13-1396, The Hague Dist. Ct. (Chamber for Comm. Affairs June 24, 2015), available at <http://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBD HA:2015:7196>, under appeal.

92. The Dutch court started with the ultimate objective of the UNFCCC, viz. the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system . . . within a time-frame sufficient to” prevent the most significant adverse impacts of climate change. UNFCCC, art. 2. The UNFCCC establishes the principle that “the developed country Parties should take the lead in combating climate change and the adverse effects thereof.” UNFCCC, art. 3, §1. The Dutch court also relied on the obligation, in keeping with this principle, that each Annex I Party, including the Netherlands and the United States, “adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs.” UNFCCC, art. 3, §2(a). The Dutch court also cited the treaty’s requirement that the Annex I Parties implement policies and measures with the “aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases.” UNFCCC, art. 3, §2(b). The Dutch court derived the specific 25% reduction from a series of several non-binding determinations made by the Parties to the UNFCCC at the annual COP, and a detailed analysis of internationally accepted scientific findings of what would be necessary to stabilize emissions to prevent dangerous anthropogenic climate change according to the reports of the IPCC.

93. *Urgenda*, C/09/456689, HA ZA 13-1396, at ¶ 4.43.

94. A similar lawsuit has been filed in Belgium. See Julia Olson, *Judges Can Save Us From Climate Change, and They’ve Already Started*, DAILY KOS, July 6, 2015), <http://www.dailykos.com/story/2015/7/6/1399668/-Judges-Can-Save-Us-From-Climate-Change-And-They-ve-Already-Started>.

that an 80-95% reduction will be required by that time.⁹⁵ Given the executive branch's constitutional authority to make treaties and to execute all laws, this commitment pursuant to a treaty that has been made with the advice and consent of the Senate should be deemed binding.⁹⁶ The good news is that the higher levels of ambition driven by such a binding action can be approached in a manner that also builds willpower.

The Dutch court's holding that the Netherlands had an obligation to interpret its laws consistent with its obligations under international treaty law is also consistent with the long-standing law of the United States holding that U.S. laws should be construed to be consistent with treaties and international law.⁹⁷ In *Murray v. Schooner Charming Betsy*,⁹⁸ Chief Justice Thurgood Marshall stated:

It has also been observed that an act of Congress ought never to be construed to violate the law of nations if any other possible construction remains, and consequently can never be construed to violate neutral rights, or to affect neutral commerce, further than is warranted by the law of nations as understood in this country. These principles are believed to be correct, and they ought to be kept in view in construing the act now under consideration.⁹⁹

Consistent with this, the courts of the United States have repeatedly held that Indian treaties and the various statutes related to rights under those treaties should be interpreted *in pari materia*.¹⁰⁰

This conclusion would apply with strength to the laws on which the United States has expressly relied to implement its obligations under the UNFCCC. This is particularly

the case with respect to the application and interpretation of the CAA, whose 1990 Amendments were developed at the same time the UNFCCC was negotiated, and which was identified by the Administration as authority for implementing the nation's international obligations.¹⁰¹ An approach similar to that adopted in *Urgenda* was applied by a federal district court in *Juliana v. United States* to deny a motion to dismiss an action against the U.S. government seeking to compel broad action to limit GHG emissions consistent with the Paris Agreement based on public trust and constitutional grounds.¹⁰²

Lawsuits grounded in state laws have had varying degrees of success in compelling broad action that could lead to programs like in California. The Massachusetts Supreme Court held that the commonwealth was required to develop an economywide program for regulating GHG emissions under the Massachusetts Global Warming Solutions Act.¹⁰³ Specifically, the court held that it must go beyond the existing RGGI program and establish binding mass-based limits for a variety of sectors, and that those limits must decline on an annual basis. The Massachusetts law, like the California Global Warming Solutions Act, has the potential of putting Massachusetts on a course like California.

In another action founded on state law, the Washington Superior Court held that the Washington State Department of Ecology was required by the state's public trust doctrine and statutory law to adopt a broad regulatory approach limiting GHG emissions consistent with the UNFCCC, but affirmed the Department's denial of a petition to do so on the ground that the Department was already initiating such a rulemaking.¹⁰⁴ Consistent with the representation, Washington has adopted a broad rule requiring periodic percentage reductions in GHGs across most sectors of the economy, and allowing emission reduction credits either from actions that achieve greater reductions, actions achieving reductions in unregulated sectors, or the surrender of an allowance from another jurisdiction with a similar economywide system to count.¹⁰⁵ This rule

95. UNFCCC, UNITED STATES OF AMERICA NDCs, available at http://unfccc.int/files/focus/indc_portal/application/pdf/u_s_cover_note_indc_and_accompanying_information.pdf.

96. U.S. CONST., art. 2, §2, cl. 2, and §3. In *Zivotofsky v. Kerry*, 576 U.S. ___ (2015), the Supreme Court held that an individual born in Jerusalem was not entitled to list Israel as his nation of birth, despite a statute designating Jerusalem as part of Israel, because the executive branch had not recognized Jerusalem as part of Israel and recognition of foreign nations was an Article II power delegated solely to the executive branch. By analogy, the fact that the commitments made by the United States in furtherance of the UNFCCC have not been incorporated into a separate treaty or protocol is irrelevant. The commitments were made by the executive branch in furtherance of the UNFCCC, a ratified treaty, and according to the procedures designated by the treaty for decisionmaking. Those commitments, thus, fall squarely within the executive branch's exclusive power under Article I of the Constitution.

97. A recent magistrate's Order and Findings & Recommendation in *Juliana v. United States*, No. 6:15-cv-1517-TC, 2016 WL 1442435, 46 ELR 20175 (D. Or. Apr. 8, 2016), cited *Urgenda* with approval. At least one other nation has reached a similar conclusion. See *Leghari v. Federation of Pakistan*, W.P. No. 25501/2015 (Lahore High Ct. Green Bench 2015) (ordering Pakistani government to implement Pakistani National Climate Change Policy, 2012, as fundamental right).

98. *Murray v. Schooner Charming Betsy*, 6 U.S. 64, 118 (1804).

99. *Accord Weinberger v. Rossi*, 456 U.S. 25, 32 (1982); *Hartford Fire Ins. Co. v. California*, 509 U.S. 764, 814-15 (1993) (Scalia, J., dissenting); *Spector v. Norwegian Cruise Line, Ltd.*, 545 U.S. 119, 142, 125 S. Ct. 2169, 2185 (2005) (Ginsburg, J., concurring).

100. See *Fee v. Brown*, 162 U.S. 602 (1896); *Yellowfish v. City of Stillwater*, 691 F.2d 926, 930 (10th Cir. 1982); *Confederated Salish & Kootenai Tribes v. Namen*, 380 F. Supp. 452 (D. Mont. 1974).

101. The *in pari materia* doctrine applies to the UNFCCC and the CAA in that (1) the UNFCCC and the CAA share the same purpose of preventing and limiting air pollution that will endanger health or the environment, and (2) the drafters were aware of the requirements under the two laws in that the Bush Administration was intimately involved in drafting both the UNFCCC between 1988 and its 1992 release for ratification and the comprehensive CAA Amendments that were adopted in 1990.

102. *Juliana*, No. 6:15-cv-1517-TC, 46 ELR 20175 (D. Or. 2016). The district court affirmed a magistrate's recommended decision that cited *Urgenda*. *Alec L. v. McCarthy*, Magistrate's Recommended Decision (D. Or. Apr. 13, 2016).

103. *Kain v. Department of Envtl. Prot.*, 474 Mass. 278, 46 ELR 20094 (Mass. 2016).

104. *Foster et al. v. Washington Dep't of Ecology*, No. 14-2-25295-1 SEA, slip op. (Wash. Super. Ct. Apr. 29, 2016).

105. The Clean Air Rule, WASH. ADMIN. CODE ch. 173-442; see WASH. ADMIN. CODE §173-442-170 (establishing trading); The plaintiffs in *Foster* have challenged the regulation as insufficient and on December 16, 2016, the Court denied plaintiff's motion for contempt by, sua sponte, granting them leave to amend their petition to plead therein a complaint for declaratory judgment or other action regarding their claims that respondent Ecology and/or others are violating their rights to a healthy environment as protected by statute, by Article I, Sec-

has the potential to facilitate the ambition and willpower to implement a suite of programs that can reduce emissions while furthering other energy and economic objectives.

Another action in Pennsylvania, based on the commonwealth's constitutional Environmental Rights Amendment,¹⁰⁶ was dismissed by the Commonwealth Court without reaching the ultimate issue, but may yet succeed on appeal.¹⁰⁷ The plaintiffs' complaint sought to compel the commonwealth to undertake unspecified actions to address climate change economywide and to limit concentrations of GHGs to 350 parts per million. The court rejected Pennsylvania's preliminary objections based on lack of jurisdiction and standing. However, it found that the complaint did not allege a specific mandatory duty, and that the relief that was sought would be premature as an advisory opinion. Interestingly, even while dismissing the case, the court noted that the commonwealth had acknowledged that Pennsylvania's air pollution control laws imposed a duty to promulgate and implement rules and regulations to reduce CO₂ and GHG emissions, derived from requirements to implement federal law, including the Supreme Court ruling that GHGs qualify as "pollutants." Although the court cited two prior rulemaking petitions by the same plaintiff, the discussion may leave open the possible pursuit of a more specific rulemaking petition.

VI. Building Willpower and Ambition Under the Trump Administration, Republican Congress, and States

During the recent presidential campaign, President Trump was explicit about his plans to prevent EPA from pursuing the CPP and his intent to withdraw the United States from the Paris Agreement. Although his ability to implement these plans is fraught with legal difficulties and he may be compelled through litigation to implement mandatory duties under the CAA, reliance on the CAA alone is unlikely to significantly reduce GHG emissions within the time frame necessary to achieve the goals of the Paris Agreement. Moreover, congressional action on comprehensive climate change legislation during a Trump Administration remains equally problematic.

That said, there may be opportunities for bipartisan, multi-objective legislation that meets non-climate national priorities while also achieving substantial reductions in GHG emissions. This could occur in a piecemeal fashion that nonetheless add up significantly, as past actions have in the United States, and through actions of interest for other reasons.¹⁰⁸ In fact, the Paris NDC process provides a

framework for exactly such an approach by enabling selection of a combination of measures within and across sectors under an open planning framework.

One such area of opportunity is investment in infrastructure. President Trump has articulated an interest in launching a massive infrastructure improvement program. Any such undertaking will require the participation of the U.S. Congress. Several areas for multi-objective legislation that could meet Administration and congressional priorities *and* mitigate carbon emissions include (among others): (1) upgrades to the nation's electricity grid; (2) improvements to the transportation system; (3) modernization of wastewater and drinking water infrastructure; (4) carbon capture and sequestration; and (5) construction and renovation of residential, commercial, and industrial building stock. It will be necessary to fund this infrastructure program, and funding through a carbon emissions fee might be the only alternative for limiting increases in the national debt consistent with the president's goal of reducing corporate and individual income taxes.

The U.S. electricity grid is a highly complex web of investor- and publicly owned power plants and transmission lines developed over decades to meet local and regional demands for electricity. Although it has served the American public well in the past, in recent years, the existing grid has become more vulnerable to cyberattacks and reliability threats. A recent report from the U.S. Department of Homeland Security noted that the energy sector was the most targeted infrastructure sector in the United States.¹⁰⁹ In 2007, Congress and the president enacted the EISA to provide financial support for the development of a national "smart grid."¹¹⁰ The idea behind a smart grid is, among other things, to upgrade the existing grid to allow for the greater use of modern technologies that provide two-way communication between energy producers and energy customers, eliminate vulnerabilities to cyberattacks, reduce power outages, promote the efficient use of electricity, and reduce customer costs.

Although the EISA was a welcomed first step, development of a nationwide smart grid will require additional financial and technical support. This is an area where the president and Congress might agree on legislation that advances national security interests while also satisfying other national priorities and objectives. For instance, "hardening" the smart grid to withstand extreme weather conditions will promote reliability while simultaneously making the grid less susceptible to climate-related coastal sea surges and intense rainstorms. Also, improvements to the existing electric grid can provide enhanced opportunities to capture more distributed energy from wind and

tion 30, Article XVH, Section 1, and Article XVII, Section I of the Washington State Constitution and the Public Trust Doctrine embodied therein.

106. PA. CONST. art. 1.

107. Funk v. Wolf, 108 A.3d 140, 167 (Pa. Commw. Ct. 2015).

108. See the CCS International Energy Workshop Paper and associated analysis of past U.S. actions: PAT DELAQUIL ET AL., DEVELOPING AND ASSESSING ECONOMIC, ENERGY, AND CLIMATE SECURITY AND INVESTMENT OPTIONS FOR THE US: 2012 INTERNATIONAL ENERGY WORKSHOP PAPER (CCS

2012), available at <http://www.climatestrategies.us/library/library/view/993>, and Hal T. Nelson et al., *The Great Recession or Progressive Energy Policies? Explaining the Decline in US Greenhouse Gas Emissions Forecasts*, 59 J. ENVTL. PLAN. & MGMT. 480-500 (2015), available at <http://www.climatestrategies.us/library/library/index/104>.

109. U.S. DEPARTMENT OF HOMELAND SECURITY, ICS-CERT MONITOR, SEPTEMBER 2014-FEBRUARY 2015.

110. Pub. L. No. 110-140 (2007).

solar sources, resulting in reduced consumer costs, high-tech job creation, and reduced carbon emissions. In addition, improvements to existing transmission lines can greatly reduce line losses and increase the efficiency of the grid, resulting in appreciably reduced carbon pollution.¹¹¹

Improvements to the nation's transportation infrastructure provide similar multi-objective opportunities. According to the Business Roundtable, highway congestion in the United States cost the national economy more than \$120 billion in 2011.¹¹² The federal Highway Trust Fund was recently funded for an additional five years, but the infrastructure needs far exceed the funding provided. If President Trump seeks additional monies for the nation's highways, those funds could promote the use of technologies that are truly transformative and climate friendly. Of necessity, the nation's 21st century highway system must be designed to accommodate autonomous and connected vehicle technologies—driverless vehicles. These technologies, by their very nature, will be more efficient, use less carbon-based fuel, and ease urban vehicle congestion.

Upgrading the U.S. highway system also allows for the construction of a nationwide electric vehicle refueling network. As the demand for electric vehicles continues to grow, consumers will require convenient locations to refuel their vehicles on lengthy road trips. The greater use of efficient, electric vehicles on American highways will have the added benefit of improving the nation's carbon footprint. President Trump has also expressed an interest in promoting improvements in public transportation, having criticized the U.S. inability to build a 300-miles-per-hour train.

EPA has estimated that required improvements to the nation's drinking water and wastewater infrastructure could exceed \$655 billion over the next 20 years.¹¹³ The importance of replacing our aged water infrastructure most recently came to light in Flint, Michigan, where an entire community was exposed to drinking water contaminated with high levels of lead from old service lines and pipes. Elected officials have been sensitized to the importance of providing healthy, drinkable water to all citizens, especially children. In providing funding for drinking water and wastewater infrastructure, the president and Congress could attain long overdue national public health and water quality goals, while also promoting energy efficiency and lowering carbon emissions. Existing drinking water and wastewater facilities are huge electricity users. Energy use from the water system (e.g., water and wastewater supply, pumping, and treatment) is responsible for five percent of the GHG emissions in the United States and 19% of GHG emissions in the state of California.¹¹⁴

By employing more efficient technologies and replacing traditional pipes and pumps with green infrastructure,¹¹⁵ GHG emissions associated with water infrastructure could be substantially reduced.

Providing appropriations for already-authorized federal loan guarantees¹¹⁶ for implementation of a carbon capture and sequestration network for fossil fuel-fired power plants could facilitate the development of the necessary infrastructure and support for the coal industry and job growth promised during the election. A carbon capture and sequestration emissions control system removing 90% of CO₂ emissions from an existing coal-fired power plant and supplying CO₂ to a 27-mile pipeline for use in enhanced oil recovery became operational in the United States in January 2017,¹¹⁷ and a similar add-on system is operational and successfully removing 90% of emissions from an existing plant in Saskatchewan, Canada.¹¹⁸

An additional opportunity for multi-objective legislation presents itself with the construction of new buildings and the renovation of existing structures. The president certainly has construction experience, and an infrastructure initiative that encourages energy-efficient construction could greatly reduce carbon pollution. Nationally, carbon emissions from residential, commercial, and industrial buildings account for approximately 40% of total GHG emissions, half of which are direct emissions from heating and cooling, and the other half indirect emissions from electricity use.¹¹⁹ Requiring or incentivizing the use of energy-efficient technologies and applying more stringent energy codes for new building construction and existing building renovations could foster the economic growth and expansion sought by the president while also shrinking the nation's carbon footprint.

reports/documents/CarbonFootprintofWater-RiverNetwork-2009.pdf (last visited Jan. 5, 2017). This figure appears to relate to energy use without consideration of methane generation from wastewater and water treatment.

115. For an explanation of green infrastructure, its significance in reducing infrastructure costs, and its environmental benefits, see U.S. EPA, *Green Infrastructure*, <https://www.epa.gov/green-infrastructure> (last visited Dec. 15, 2016).

116. Section 1703 of the Energy Policy Act of 2005 (Pub. L. No. 109-58) authorized the Secretary of Energy to make loan guarantees for projects that (1) avoid, reduce, or sequester air pollutants or anthropogenic emissions of GHGs; and (2) employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time. The program is authorized but not funded.

117. See John Schwartz, *Can Carbon Capture Technology Prosper Under Trump?*, N.Y. TIMES (Jan. 2, 2017), available at <http://www.nytimes.com/2017/01/02/science/donald-trump-carbon-capture-clean-coal.html?smprod=nytcore-iphone&smid=nytcore-iphone-share> (last visited Jan. 4, 2017); see also U.S. Department of Energy, National Energy Technology Laboratory, *Recovery Act: Petra Nova Parish Holdings: W.A. Parish Post-Combustion CO₂ Capture and Sequestration Project*, <https://www.netl.doe.gov/research/coal/project-information/fe0003311> (last visited Dec. 15, 2016).

118. Brief of *Amicus Curiae* Saskatchewan Power Corporation, Operating of Boundary Dam Carbon Capture and Storage (CCS) Facility, in Support of Respondents, *North Dakota v. EPA*, No. 15-1381 (D.C. Cir. Dec. 21, 2016) (appeal of GHG NSPS standards).

119. U.S. ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2016: WITH PROJECTIONS TO 2040 (2016) (DOE/EIA-0383(2016)).

111. Existing electricity transmission lines are notoriously "leaky," with losses in the thousands of megawatts. By eliminating this leakage, utilities can avoid constructing additional new power plants fueled by carbon-based fuels like coal and natural gas.

112. BUSINESS ROUNDTABLE, ROAD TO GROWTH: THE CASE FOR INVESTING IN AMERICA'S TRANSPORTATION INFRASTRUCTURE (2015).

113. Joel Beauvais, *Water Infrastructure Is Everyone's Business*, EPA CONNECT, July 19, 2016.

114. Bevan Griffiths-Sattenspiel & Wendy Wilson, *The Carbon Footprint of Water* (2009) at 1, 6, available at <https://www.csu.edu/cerc/research>

VII. Conclusion

The Paris Agreement provides an open and excellent opportunity to pursue approaches to climate action that simultaneously build willpower and ambition whether through new or existing law and policy. However, the Agreement's objectives cannot be achieved through "business as usual." Constructive reform and revision are needed. In seeking templates for future action, pragmatic actions within U.S. states and localities, federal executive agencies, and Congress might be a good place to start to produce high levels of cumulative impact and political acceptance. At the same time, a more systematic and strategic framework for action is needed to move climate change law and policy to the level required by the Paris Agreement.

In the past decade, many U.S. states initiated broad, multi-objective, capacity-driven, open, stakeholder-based planning, and implementation efforts have identified suites (or portfolios) of measures to achieve significant carbon emission reductions in a manner that promotes objectives necessary to build both willpower and ambition for meaningful climate action. The experiences in these states over the past decade, including more than 20 that have pursued such approaches through formal procedures,¹²⁰ demonstrate that such efforts can provide the willpower to implement these measures if approached properly, but may face daunting odds if they do not. Many cities and local governments have initiated similarly successful processes with seeds for future systems.

Litigation also can be successful at building willpower if it is approached properly and is not greeted with hostility in terms of opportunities for positive reform and revision. In the United States, the establishment of a federal floor and SIP call under §115, or the establishment of a GHG

NAAQS, has the potential to open the door to positive outcomes nationwide. Past planning processes and studies that focused narrowly on the CPP or similar technology-based approaches, however, did not sufficiently address the need for economic and energy alignment to address political and economic concerns, but rather centered on technology-based measures intended to meet a confined set of goals under the CAA.

A narrow technology-based approach need not be replicated. Instead, future rulemaking could embrace long-term emission reduction goals through cross-sectoral opportunities, open decisionmaking, and broader performance indicators such as employment, income, job growth, capacity, investment, public involvement needs, and free and open policy choices. Even if the CPP survives legal review, a broader approach for building willpower and ambition will be needed for all applications of climate law and policy going forward to address the realities of climate policy needs.

Although litigation can drive part of this broader approach, under the Trump Administration, a Republican-led Congress, and states dominated by Republican governors (32 of 50), continued progress in reducing GHG emissions might become more likely if done in conjunction with other measures that meet President Trump's infrastructure development, national security, and related priorities. Looking for such opportunities will take on a heightened significance if litigation limits reliance on the CAA as an effective tool for mitigating carbon emissions. Whatever opportunities do arise must be pursued aggressively in the United States and in other nations if we are to expand the ambition and willpower necessary to attain the Paris Agreement and UNFCCC goal of holding the global average temperature increase to below 2°C.

120. For a listing and documentation of state climate action plans developed since 2004, see the Center for Climate Strategies (CCS), *State and Local Climate Blackboard*, http://www.climatestrategies.us/policy_tracker/state/index (last visited Dec. 15, 2016). More than 20 of these initiatives followed formal systematic procedures developed by the CCS to ensure high levels of stakeholder and agency consensus.