DESIGNING AND UPDATING A U.S. CARBON TAX IN AN UNCERTAIN WORLD

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INTRODUCTION

A carbon tax can provide clear, strong incentives for investment and consumption decisions that result in lower carbon dioxide emissions. One of the appeals of a carbon tax is that it delivers certainty about the carbon price, in contrast to conventional regulatory approaches or cap-and-trade programs.[1] The carbon price certainty translates into greater certainty about returns to climate-friendly investments, such as developing a wind farm, buying a fuel-efficient car, living near mass transit, and undertaking advanced battery research and development.[2]

The design of an emission mitigation program with a focus on price certainty, however, would occur in a policy context characterized by environmental, international relations, and economic uncertainties. With opportunities for learning over time that can reduce, or at least change, the uncertainties along these three dimensions, an effective mitigation program would permit continual updating of the carbon price. Indeed, scholars have long advocated for an emission mitigation strategy that incorporates learning and updating of the mitigation instruments.[3]

For example, if the risks posed by climate change appear greater than what previous scientific research had indicated, a more ambitious mitigation effort driven by a higher carbon tax would be merited. If other countries pursue more ambitious mitigation efforts, then the government could reciprocate with a higher carbon tax. If the economic costs are lower or the distributional impacts less adverse than anticipated, then a higher tax could be politically feasible. If the politics framing the initial creation of the carbon tax results in a tax rate less than the marginal benefit of abating carbon dioxide emissions, then a higher tax rate would be justified on economic grounds as well. Of course, new information going in the opposite direction of these illustrations would suggest a lower carbon tax.

Policy updating occurs naturally under conventional regulatory approaches. Many statutes provide guidance to regulators on the periodicity of rulemaking as well as on the

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[1] Joseph E. Aldy & Robert N. Stavins, *Using the Market to Address Climate Change: Insights from Theory and Experience*, 141 DAEDALUS 45, 47 (2012).

[2] For a general discussion about the role of uncertainty in investment, see generally Ben S. Bernanke, *Irreversibility, Uncertainty, and Cyclical Investment*, 98 Q. J. ECON. 85 (1983); AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY (1994).

[3] For an early illustration of this learning and updating framework, see ALAN S. MANNE & RICHARD G. RICHELS, BUYING GREENHOUSE INSURANCE: THE ECONOMIC COSTS OF CARBON DIOXIDE EMISSION LIMITS (1992).

criteria for setting and revising standards. For example, Congress directed the Department of Energy to review minimum energy efficiency standards for appliances every six years under the 2007 Energy Independence and Security Act.[4] Under this review process, the Secretary of Energy must either publish a notice indicating that no new standard is necessary or propose a new regulation for a new standard. In addition, the New Source Performance Standards under the Clean Air Act establish a standard that reflects the extent to which emission reduction technologies have "been adequately demonstrated," a definition which necessarily evolves with innovation.[5] As a result, many standards are set through a specified date and the regulator has discretion to update the standard for compliance periods after the initial target date.

However, an emission mitigation program reliant on the revision of standards presents certain obstacles. In contrast to the regulatory contexts in which Congress has delegated updating authority to regulators, Congress has never delegated the setting or updating of marginal tax rates to the Treasury Department.[6] But, Congress, if so desired, may set a tax in a given bill to run through a specified date (e.g., a sunset provision) or indefinitely. Congress may also create a simple or complex schedule that the Department of Treasury would implement, e.g., setting income tax rates conditional on a taxpayer's level of realized income or a carbon tax rate conditional on past carbon dioxide emissions (see discussion below on this). The historic norm in the U.S. has been that any changes to that tax schedule (aside from technical adjustments, such as for inflation) can only occur through new legislation.[7]

Also, the uncertainty about the timing of legislative updates could have adverse economic, environmental, and diplomatic consequences. There could be long periods between updates due to Congressional gridlock—such as the 13-year gap between the 1992 and 2005 energy bills—and potentially short periods in between updates due to change of control of the U.S. Congress—such as the 2-year gap between the 2005 and 2007 energy bills. The lack of predictability in the carbon price over time could undermine business and household planning and investment. This uncertainty could increase the costs associated with a carbon tax and reduce potential environmental benefits (emissions abatement).[8] Moreover, uncertainty in the timing of updates may mean that the carbon tax does not adjust in response to new information and research about the environmental damages associated with climate change. Finally, idiosyncratic updates of the carbon tax could undermine a country's negotiating strategy in international climate talks, especially in the periodic updating of national emission mitigation pledges.

One approach to address these uncertainties would be to craft a carbon tax schedule in law that permits tax adjustments if specific conditions are realized. For example, Prof. Metcalf proposed a Responsive Emissions Autonomous Carbon Tax that would increase

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[4] Pub. L. No. 110–140, § 305(a), 121 Stat. 1553 (codified with some differences in language at 42 U.S.C. § 6313(a)(6)(C) (2012)).
[5] 42 U.S.C. § 7411(a)(1) (2012).
[6] James R. Hines Jr. & Kyle D. Logue, *Delegating Tax*, 114 MICH. L. REV. 235, 253 (2015).
[7] *See id.* at 257.
[8] Joseph E. Aldy & W. Kip Viscusi, *Environmental Risk and Uncertainty*, *in* 1 HANDBOOK OF THE ECONOMICS OF RISK AND UNCERTAINTY 601, 628 (Mark Machina & W. Kip Viscusi eds., 2014).

the growth rate in the carbon tax over time if U.S. emissions fail to fall below specified benchmark targets.[9] Dr. Hafstead et al. advance this idea with their Tax Adjustment Mechanism for Policy Pre-Commitment that would also modify the carbon tax in light of realized emission performance.[10] Likewise, Dr. Murray et al. discuss various ways of increasing emissions certainty under a carbon tax, including through automatic tax rate adjustments given emission outcomes.[11] In my proposal, I take an alternative approach. Given the challenge in specifying the full suite of conditions that reflect all important elements of uncertainty in a tax schedule, I propose a structured discretionary approach instead of the rule-based approach proposed by Prof. Metcalf and Dr. Hafstead. While these are two distinct approaches to addressing uncertainty, they are not necessarily mutually exclusive. An adjustment schedule based on emissions could be coupled with the broader review and updating considered in this Essay.

The Essay is structured as follows: Part I describes how carbon tax design can promote predictable climate change policy. To make concrete how a carbon tax could be updated, Part II describes a proposal for institutionalizing periodic review and updating of the carbon tax. Part III elaborates how the review of climate science, international relations, and economics would inform the updating of the carbon tax. Part IV describes the relationship between a domestic carbon tax and multilateral climate policy, especially how such an updating approach can leverage greater emission mitigation ambition by international partners under the Paris Agreement.

I. PROMOTING PREDICTABLE CARBON PRICING POLICY

Ensuring predictability in carbon tax policy is essential to driving technological development and deployment. Firms will make better investment decisions, families and individuals will make plans that best suit their preferences, and innovators will focus efforts on carbon-oriented inventions when they can form expectations about how a climate policy will impact the quality, variation, and prices in goods and services. A predictable climate policy can increase the likelihood that their expectations are in line with what is subsequently realized in markets. Moreover, to the extent that a predictable policy creates a political constituency for its continuation, the more likely it is to endure politically.[12]

The need for predictability implicates two elements of carbon tax design. First, a carbon tax should be designed so that the tax is in place for many years into the future. As in past Congressional bills, this could take the form of setting the tax in the first year and then establishing an annual percentage change to the tax that applies in perpetuity, or until changed by a future Congress.[13] For example, the tax rate per ton of carbon dioxide

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[9] Gilbert E. Metcalf, *Cost Containment in Climate Change Policy: Alternative Approaches to Mitigating Price Volatility*, 29 VA. TAX REV. 381, 391–92 (2009).

[10] Marc Hafstead et al., *Adding Quantity Certainty to a Carbon Tax Through a Tax Adjustment Mechanism for Policy Pre-Commitment*, 41 Harv. Envtl. L. Rev. F. 41 (2017).

[11] Brian C. Murray et al., *Increasing Emissions Certainty Under a Carbon Tax*, 41 HARV. ENVTL. L. REV. F. 14 (2017).

[12] Ann E. Carlson & Robert W. Fri, *Designing a Durable Energy Policy*, 142 DAEDALUS 119, 122 (2013).

[13] For illustrations of this form of a carbon tax, see S. 2399, 114th Cong. § 101 (2015); H.R. 2202, 114th Cong. § 2 (2015); S. 1548, 114th Cong. § 2 (2015).

would be initially set at X dollars per ton, and would increase by Y percent each year. This differs from cap-and-trade and command-and-control regulations in which prices are not pre-determined; historical experience shows dramatic cap-and-trade allowance price volatility.[14]

Second, a durable carbon tax should be adjusted in light of new information. As the science of climate change improves, as we learn more about the costs of reducing greenhouse gas emissions, and as the U.S. continues to cooperate with other countries in international climate policy, there may be reasons to adjust the carbon tax. For example, if scientific research suggests that adverse climate change impacts are likely to be more severe than previously believed, then a higher carbon tax could be justified. If the costs to the economy of reducing emissions are greater than initially anticipated, then a lower carbon tax could be justified. If the rest of the global community implements ambitious emission mitigation programs, then the U.S. could reciprocate by ramping up its carbon tax. Explicitly establishing these conditions as the basis for updating the carbon tax could ensure the predictability of U.S. carbon tax policy.

II. THE PROPOSAL: INSTITUTIONALIZING CARBON TAX UPDATING

The primary objective of a carbon tax is to drive emissions abatement in order to mitigate climate change risks. The global nature of the problem, however, requires emission reduction efforts around the world. Structuring the U.S. climate change policy program in the way described above can both send the necessary price signals throughout the economy to reduce U.S. carbon dioxide emissions and create the incentives to leverage meaningful mitigation efforts abroad. Moreover, updating the carbon tax to account for advances in our understanding of climate change ensures that the tax rate is set appropriate to the challenge. This approach provides the opportunity—and creates the transparency and associated accountability—for the government to update the carbon tax when necessary.

The proposed carbon tax updating occurs in three steps: (1) reporting, (2) proposing a Congressional resolution, and (3) legislative action. The Environmental Protection Agency ("EPA"), the Department of the Treasury ("Treasury"), and the Department of State ("State") would undertake analysis and submit reports to the Congress. The EPA report would focus on climate science, surveying the latest research, highlighting key uncertainties, and noting how the science has evolved since the carbon tax policy was last set. The Treasury report would focus on the carbon tax's economic costs and benefits (net social benefits as well as distributional impacts), its cost-effectiveness, the revenue implications of the carbon tax, and the effect of the tax on carbon dioxide emissions. The State Department report would focus on the emission mitigation efforts in other countries, the plans of other nations to update their domestic mitigation programs, and progress under the 2015 Paris Agreement. While each of these agencies would be the lead agency responsible for drafting and submitting its report to Congress, they would be expected to consult with and draw expertise from other government agencies in their assignments. For example, EPA could draw on expertise on the science and impacts of

[14] *See* Aldy & Viscusi, *supra* note 8, at 628.

climate change from agencies participating in the U.S. Global Change Research Program and the Treasury Department could draw from data and expertise at the EPA on carbon dioxide emissions.

Based on the key findings in these reports, the President would submit a recommendation to Congress on whether and how to adjust the carbon tax. This recommendation would be constrained by: (1) applying no earlier to the carbon tax schedule than a fixed number of years in the future; and (2) applying to only the level of the tax rate (X) and/or the annual percentage change (Y). The recommendation would take the form of a joint resolution that would not be subject to amendment.[15] Moreover, the statute authorizing the carbon tax and this updating process would specify the legislative mechanisms such that the updating resolution could come to the floor of each house of Congress without explicit action by Congressional leadership or committees of jurisdiction. The authorizing statute could also specify the number of days by which the updating resolution must be subject to floor consideration. As a revenue-oriented piece of legislation, the resolution would need to originate in the House of Representatives. In the event that Congress votes down the resolution based on the President's proposal, then the status quo tax schedule would remain U.S. law.

The statute authorizing this presidential recommendation would provide guidance on its frequency. Specifically, Congress could direct the Executive Branch to report on the findings and submit a resolution for proposed changes to the carbon tax on a schedule in line with the periodic review and updating of nations' emission mitigation pledges (so-called Nationally Determined Contributions) under the Paris Agreement.[16] This would result in a review and consideration of updates to the carbon tax every five years. The Congressional guidance in the authorizing statute would also call on the President to recommend an updated proposal before the next round of emission mitigation pledging in the climate change negotiations.[17] In this case, the review of the carbon tax could be part of the broader review and updating of the country's Nationally Determined Contribution.

The President could request Congressional consideration of the resolution after the most recent round of emission mitigation pledging in the international climate talks. If the pledging round results in ambitious and comparable domestic mitigation contributions by other major parties to the negotiations, the President may offer a strong endorsement of the carbon tax updating proposal. If the pledging round results in less ambitious or non-comparable mitigation actions by other countries, then the President may suggest that Congress send a signal by voting down the proposal.

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[15] For more information about resolutions that are not subject to amendment or filibuster, see infra notes 18–30 and accompanying text.

[16] Framework Convention on Climate Change, *Adoption of the Paris Agreement*, U.N. DOC. FCCC/CP/2015/L.9/REV.1 (Dec. 12, 2015), https://perma.cc/5ZRS-4NP3 [hereinafter *Paris Agreement*]. Paragraph 9 of Article 4 calls for parties to the agreement to communicate its national contributions every five years.

[17] Submitting the resolution to Congress prior to the next round of climate change negotiations serves to bind the hands of the negotiators in a constructive manner. *See, e.g.*, Robert D. Putnam, *Diplomacy and Domestic Politics: The Logic of Two-Level Games*, 42 INT'L ORG. 427, 435–41 (1988) (discussing that in a two-level negotiation, a small domestic win-set, in which any modification to the domestic agreement counts as a rejection, can be a bargaining advantage on the international stage).

This approach to carbon tax updating has several important analogues in existing regulatory, trade, and monetary policy frameworks. For example, the substantive reports from the executive branch to inform Congressional action is the norm under the Congressional Review Act[18] and trade promotion authority. Under the Congressional Review Act, agencies are required to submit the final rules and accompanying cost-benefit analysis for all "major" rules (typically based on surpassing an economic impact threshold).[19] Members of Congress may review the rule and analysis before deciding whether to sponsor resolution of disapproval, which would effectively block the final rule from taking effect.[20] Under the Bipartisan Congressional Trade Priorities and Accountability Act of 2015,[21] a number of reports to Congress are required in consideration of negotiated trade agreements. For example, in conjunction with the submission of a negotiated trade agreement for Congress' consideration, the President must also provide supporting information that explains and justifies the agreement in light of the trade policy objectives delineated by Congress in this statute.[22] In addition, if the President requests a three-year extension of the trade authorities' procedures, then the President, the Advisory Committee for Trade Policy and Negotiations, and the International Trade Commission must submit reports to inform Congress in its oversight and consideration of whether to sponsor a resolution of disapproval.[23]

To facilitate the predictability of these Presidential recommendations, the law authorizing the carbon tax could also require EPA, Treasury, and the State Department to issue principles for carbon tax adjustments and "forward guidance." These agencies would identify the data and analyses that they consult in formulating their recommendation to the President, and, in periodic communications, note how they are interpreting the evolving evidence. For example, if these agencies submit a major report every five years to accompany a Presidential recommendation for a resolution, then they could also issue annual reports to inform the adjustment of expectations over time. Just as the Federal Reserve System's Federal Open Market Committee attempts to communicate its policy and the underlying evidentiary basis for its policy position so as to minimize surprises to the business and financial communities,[24] these annual reports could permit firms to update expectations over the likely carbon tax proposal. To guide the agency development of principles, Congress could also state key principles that the agencies should employ and, as necessary, elaborate. This would be akin to guidance on negotiating objectives in trade promotion authority legislation.

Constraining future legislative consideration of the carbon tax updating resolution could also be analogous to how the Congressional Review Act and the Trade Act of 1974 constrain legislative consideration of regulations and trade deals. Under the Congressional Review Act, Congress may pass a disapproval resolution, based on a

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[18] Congressional Review Act, 5 U.S.C. §§ 801–802 (2012).
[19] *Id.* § 801 (2012).
[20] *Id.* § 802 (2012).
[21] Bipartisan Congressional Trade Priorities and Accountability Act of 2015, 19 U.S.C. §§ 4201–4210 (2012).
[22] *Id.* § 2213 (2012).
[23] *Id.* §§ 2151, 2155 (2012).
[24] *See* KATHERINE FEMIA ET AL., FED. RESERVE BANK OF N.Y., THE EFFECTS OF POLICY GUIDANCE ON PERCEPTIONS OF THE FED'S REACTION FUNCTION (Staff Report no. 652, 2013).

resolution template specified in the law, to preclude a regulation from taking effect.[25] The disapproval resolution is time-limited, not subject to amendment, and may be discharged out of committee without committee action.[26] The law proscribes the use of the filibuster and limits the time for debate in the Senate.[27] Likewise, dating back to the mid-1970s, Congress has granted trade promotion authorities to the executive branch that allow for a trade deal to be automatically introduced through an implementing bill that would receive a vote on the floor of both houses of Congress.[28] The most recent trade promotion authority law continues the use of the expedited process first authorized in the Trade Act of 1974, which requires a vote subject to a time-limit, prohibits amendments to the proposed trade deal, and proscribes House Rules Committee and Senate filibuster options.[29] Similarly, a carbon tax statute could specify that the President's recommendation would automatically be introduced as implementing legislation based on a statutory template. The resolution would originate in the Ways and Means Committee of the House of Representatives and, just as in the case of the trade promotion authorities, the statute could specify the nature of the rules governing amendments, the need for committee discharge, the basis for floor consideration, the length of floor debate, and the potential role of the Senate filibuster.

III. COMPILING THE INFORMATION TO SUPPORT SMART TAX UPDATES

This Part describes in greater detail the EPA, Treasury, and State reports that provide the basis for the Presidential recommendation for updating the carbon tax and inform Congressional deliberations of the updating proposal.

A. EPA: Incorporating and Communicating the Latest Insights from Climate Science

A carbon tax is intended to drive emission reductions and mitigate the risks posed by climate change. While the effect of anthropogenic greenhouse gas emissions on the global climate is well understood in the relevant scientific disciplines,[30] there are still important uncertainties about the timing, location, and severity of climate change impacts.[31] As scientific research continues and as the world warms in response to higher atmospheric concentrations of greenhouse gases, some of the uncertainties about climate change impacts will be resolved. Reviewing and synthesizing the latest insights from climate science can provide a key evidentiary basis for the carbon tax policy.

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[25] 5 U.S.C. § 802 (2012).
[26] *Id.*
[27] *Id.*
[28] IAN F. FERGUSSON & RICHARD S. BETH, CONG. RESEARCH SERV., R43491, TRADE PROMOTION AUTHORITY (TPA): FREQUENTLY ASKED QUESTIONS 1 (2015).
[29] 19 U.S.C. § 2191.
[30] *Summary for Policymakers*, *in* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013— THE PHYSICAL SCIENCE BASIS: CONTRIBUTION OF WORKING GROUP I TO THE FIFTH ASSESSMENT REPORT OF THE IPCC 3, 3–29 (2013).
[31] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS 114 (2013).

Learning about climate science could highlight whether the carbon tax and its trajectory under current law would be too high, too low, or about right. For example, if the innovations in climate science suggest that climate change is becoming worse compared to our earlier understanding, then that would serve as the basis for calling for a higher carbon tax (and/or greater rate of annual increase). If climate research suggests the opposite, then it would justify a lower carbon tax.

The review of climate science and impacts would also examine the efficacy and costs of adaptation. More effective adaptation efforts translate into lower climatic damages for a given amount of global warming. More extensive adaptation efforts also likely require greater resources. Characterizing adaptation response functions of individuals, firms, and governments may improve the understanding of and precision in estimating the benefits of emission abatement under a carbon tax.[32]

The review of the climate science also provides an opportunity to communicate the climate change problem—and how government policy is addressing the problem—to the general public. EPA's report to Congress should be disseminated to the public through a variety of channels. Interactive websites could illustrate the insights from the latest climate science in an accessible and geographically specific manner. Scientific experts from the federal government could brief stakeholders and representatives of state and local governments. Outreach via field hearings, social media, educational materials, and op-eds could further serve to communicate climate science to the public. This could build on previous and ongoing efforts by the National Academy of Sciences and the U.S. Global Change Research Program.[33] Moreover, this outreach should examine ways of best communicating information to grassroots stakeholders and the lay public.

B. Treasury: Evaluating the Impacts of Domestic Carbon Tax Policy

The majority of U.S. national environmental policy operates through regulations. Under presidential executive orders dating back to the Reagan Administration, regulatory impact analyses ("RIA") accompany major rulemakings.[34] For example, the Environmental Protection Agency published a draft RIA with the proposed rulemaking for the Clean Power Plan in 2014[35] and a final RIA with the final Clean Power Plan rule

[32] Joseph E. Aldy, *Pricing Climate Risk Mitigation*, 5 NATURE CLIMATE CHANGE 396, 397 (2015).

[33] For example, see NAT'L RESEARCH COUNCIL, AMERICA'S CLIMATE CHOICES (Nat'l Acad. Press ed., 2011), https://perma.cc/TCG9-X8LC, and related outreach.

[34] President Reagan issued Exec. Order No. 12,291, 46 Fed. Reg. 13193 (Feb. 19, 1981), establishing the norm for the use of cost-benefit analysis as an input to regulatory decision-making. President Clinton later issued Exec. Order No. 12,866, 58 Fed. Reg. 51735 (Oct. 4, 1993), on Regulatory Planning and Review, superseding Exec. Order 12,291. Administrations since 1993 have used E.O. 12,866 to guide their analysis and review of executive branch agency regulations. *See* Christopher DeMuth, *OIRA at Thirty*, 63 ADMIN. L. REV. 15, 15–16 (2011).

[35] *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34,830 (proposed June 18, 2014) (to be codified at 40 C.F.R. pt. 60); EPA, DRAFT REGULATORY IMPACT ANALYSIS FOR THE PROPOSED CARBON POLLUTION GUIDELINES FOR EXISTING POWER PLANTS AND EMISSION STANDARDS FOR MODIFIED AND RECONSTRUCTED POWER PLANTS (2014).

in 2015.[36] These analyses show the impacts of the rule on the targeted environmental problem—e.g., carbon dioxide emissions—and quantify the costs and benefits of realizing this outcome. The RIAs can illustrate if a regulation will correct a market failure, such as pollution, and improve social welfare (i.e., increase net social benefits). Some analyses also show the uncertainties around these estimates as well as their distributional impacts.[37] The draft RIAs provide an opportunity for public comment on the methods, assumptions, and data inputs. The development of the RIAs also informs both the regulator as it is designing the rule and other agencies with a stake in the matter (who participate in the interagency review of the rule coordinated by the OMB).

In contrast, there is no analogous review of the economic impacts of tax policy. Aside from revenue estimates undertaken by the Treasury Department and the Joint Committee on Taxation, the government does not systematically analyze the efficacy, costs, and benefits of a change in tax policy.[38]

Even if a tax policy is motivated by the need to correct a market failure, there are no government-mandated assessments of the tax policy's net social benefits. While economists may view cap-and-trade and carbon tax as very similar instruments to implement carbon pricing,[39] the nature of the analysis, review, and transparency that they trigger under current government practice differ dramatically since one is a regulatory instrument and the other is a tax instrument.

Thus, the envisioned evaluation of the impacts of domestic carbon tax policy by the Treasury Department in this proposal would attempt to replicate the RIA typically associated with a rulemaking. Moreover, the evaluation of carbon tax policy performance would be akin to retrospective review of regulations—a process of ex post assessment of rules that has occurred idiosyncratically dating back to the 1970s.[40] The review and analysis by Treasury could simultaneously serve as an ex post review of the carbon tax to date and an ex ante analysis of various alternatives for the carbon tax going forward, including the option of the carbon tax under current law. The Treasury analysis could follow the procedures that the OMB recommends to agencies for the conduct of RIAs under OMB Circular A-4.[41] Indeed, the norm for reports to Congress is for the OMB to conduct an interagency review of the report, so this would be consistent with current practice.[42]

This proposal creates a parallel approach to analysis and transparency of the impacts of a carbon tax relative to what would occur under cap-and-trade or any other regulatory

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[36] *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,661 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60); EPA, REGULATORY IMPACT ANALYSIS FOR THE CLEAN POWER PLAN FINAL RULE (EPA-452/R-15-003) (2015).

[37] *See* OFFICE OF MGMT. & BUDGET, CIRCULAR A-4 (Sept. 17, 2003), https://perma.cc/m9H7-GUT4; OFFICE OF INFO. & REGULATORY AFFAIRS, REGULATORY IMPACT ANALYSIS: A PRIMER (2011).

[38] There does not appear to be a meaningful discussion of the omission of this kind of analysis in government policy-making in the academic literature.

[39] Joseph E. Aldy et al., *Designing Climate Mitigation Policy*, 48 J. ECON. LITERATURE 903, 918 (2010).

[40] JOSEPH E. ALDY, LEARNING FROM EXPERIENCE: AN ASSESSMENT OF THE RETROSPECTIVE REVIEWS OF AGENCY RULES AND THE EVIDENCE FOR IMPROVING THE DESIGN AND IMPLEMENTATION OF REGULATORY POLICY 27 (2014).

[41] OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, *supra* note 37.

[42] It should be noted that it is typically different parts of OMB that coordinate the review of regulatory proposals and coordinate review of reports to Congress.

approach. Doing so, however, creates a distinction in analysis of this carbon tax instrument and other tax instruments. There could be a concern that imposing such analytic requirements on a carbon tax, but not on other non-climate tax provisions and revenue-raisers, could place an undue burden on the carbon tax. While it is beyond the scope of this Essay, the public and our democratic processes could benefit from a more transparent assessment of various tax provisions, especially those that target market failures and act as alternatives to regulatory approaches in correcting market failures.

The outputs from the Treasury analysis could inform the work of the State Department by providing key data inputs as the State Department compares U.S. mitigation efforts under the carbon tax to the mitigation efforts under other countries' domestic programs. Moreover, the Treasury work could feed into the multilateral transparency mechanism under the Paris Agreement and illustrate best practice methods for reviewing and reporting on domestic climate policies.

C. State: Assessing Other Countries' Mitigation Efforts

The 2015 Paris Agreement, representing the consensus of virtually every nation in the world,[43] reflects the culmination of a six-year pivot toward a "pledge and review" regime in global climate policy. The key elements of the Paris Agreement reflect long-standing U.S. interests—a respect for sovereignty in how each country pledges voluntary emission mitigation contributions to the global effort to combat climate change[44] and a focus on transparency in implementation to assess whether all major partners undertake comparable efforts.[45] In contrast to all previous international agreements, more than 180 nations have pledged to reduce their greenhouse gas emissions under the Paris framework.

Success of international climate change policy under the Paris Agreement is premised on the theory of mutually reinforcing successive ambition: if a country takes a step forward in mitigating its emissions and if it observes its peers, neighbors, and trading partners taking similarly meaningful steps, then it would be that much more likely that the country will take an even more ambitious second step on mitigation. The outcome in Paris has enshrined the pledged contributions of countries for that first step.[46] The task going forward will center on ensuring that there is credible transparency concerning the actions of peers, neighbors, and trading partners to give countries the confidence—and to address the concerns of their domestic stakeholders and publics—that they are moving in lockstep with the rest of the international community. If the implementation of the Paris Agreement can achieve this dynamic over time, then it will succeed in delivering progressively more ambitious emission mitigation in the effort to combat climate change.[47]

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[43] North Korea is the only UN member that is not a party to the UN Framework Convention on Climate Change, the foundational treaty for the Paris Agreement.

[44] Paris Agreement, *supra* note 16, at art. 4.

[45] *See* Paris Agreement, supra note 16, at art. 13.

[46] *See* Paris Agreement, supra note 16, at art. 4.

[47] *See* Joseph E. Aldy, *Living Mitigation Plans: the Co-Evolution of Mitigation Pledge and Review* 1–21 (Harvard Project on Climate Agreements, Discussion Paper ES 16-5, 2016).

The Paris Agreement calls for a transparency mechanism to provide information on countries' performance in delivering on their mitigation pledges.[48] The poor track record on transparency in the international climate negotiations[49] suggests that the transparency regime may be "incomplete" for quite some time. As a result, individual countries as well as non-governmental entities—academics, civil society, and the business community—may play an important role in filling in the gaps of this regime. In particular, U.S. stakeholders and the general public may prefer a more rigorous evaluation by the U.S. government than an incomplete review through the UN Framework Convention on Climate Change.

Such a review could serve as the model for an effective transparency mechanism. This could include a framework for comparing the mitigation effort of other countries to the U.S. carbon tax and related implementation of its emission mitigation pledge.[50] The use of a carbon tax as the primary tool to deliver emission mitigation in the U.S. would facilitate the use of explicit and estimated carbon prices as the basis for comparing the ambition of mitigation implementation efforts in other countries. This would also have important implications for considerations of any adverse competitiveness impacts of differential domestic mitigation programs among the U.S.' major trade partners.

Finally, the review of other countries' mitigation efforts could be forward-looking in its assessment of what other countries may be expected to do in their respective domestic mitigation programs. This could provide a reference point or even a benchmark for any adjustments to the carbon tax.

IV. LEVERAGING GREATER EMISSION MITIGATION

Under the 2015 Paris Agreement, countries have pledged emission mitigation goals through 2025 or 2030 and agreed to a process of reviewing and updating their pledges every five years.[51] The process of reviewing and updating the domestic carbon tax could serve as a key component of a nation's consideration of an updated mitigation contribution. Moreover, the design of a carbon tax updating process in the U.S. would, by necessity, require Congressional action. Integrating the constraints of domestic policy-making and politics on U.S. participation in international negotiations could strengthen the U.S. negotiating position.[52]

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[48] *See* Paris Agreement, *supra* note 16, at art. 13.

[49] *See* CLARE BREIDENICH & DANIEL BODANSKY, PEW CENTER ON GLOBAL CLIMATE CHANGE, MEASUREMENT, REPORTING, AND VERIFICATION IN A POST-2012 CLIMATE AGREEMENT 15–16 (2009); Joseph E. Aldy, *The Crucial Role of Policy Surveillance in International Climate Policy*, 126 CLIMATIC CHANGE 279, 285–88 (2014); Alexander Thompson, *Management under Anarchy: The International Politics of Climate Change*, 78 CLIMATIC CHANGE 7 (2006).

[50] *See* Joseph E. Aldy & William A. Pizer, *Alternative Metrics for Comparing Domestic Climate Change Mitigation Efforts and the Emerging International Climate Policy Architecture*, 10 REV. ENVTL. ECON. & POL'Y 3, 18 (2016) (suggesting a framework and metrics for the review of emission-mitigation commitments under the pledge-and-review regime established under the 2015 UN Paris Agreement).

[51] Article 4, Paragraph 9 of the Paris Agreement calls for parties to the agreement to communicate its national contributions every five years. Paris Agreement, *supra* note 16, at 23.

[52] For more on this proposition, see Putnam, *supra* note 17, at 439.

This creates an opportunity for leveraging greater ambition by other countries. For example, the executive branch could propose a carbon tax before the next UNFCCC pledging round but request Congressional action only after that round. If other countries pledge sufficiently ambitious mitigation contributions, then this could reassure domestic stakeholders and policymakers of the seriousness of our partners' efforts and intentions. In this case, the executive branch would advocate for support of the resolution to update the carbon tax. If others' pledges are weak and not comparable to the U.S. pledge, then the executive branch could request the rejection of the resolution.

In the long-term, such an approach could enable convergence in carbon pricing if the U.S. (and perhaps a few other major parties to the negotiations) focus on the price of carbon as the standard for measuring and comparing mitigation ambition. Transparency and review of how the U.S. and other carbon tax countries increase their domestic price of carbon would serve as evidence of a country ramping up its ambition. In addition, such carbon price convergence could square with how a price-oriented approach to mitigation contributions could enable broader and more robust international coordination.[53]

CONCLUSION

A carbon tax provides a clear, predictable price signal to businesses and households. Nonetheless, the uncertainties that characterize the climate change problem suggest that the initial carbon tax level and trajectory may not be appropriate as more information is acquired about the impacts of climate change, the efforts of other countries to tackle climate change, and the domestic economic impacts of the carbon tax.

This updating proposal aims to balance the predictability of the carbon price with the need to account for new information on the impacts of climate policy. Given the considerable uncertainties about the severity and timing of the risks posed by climate change, the economic impacts of a carbon tax, and the efforts by other countries in mitigating their emissions, policymakers and the public will want to adjust climate policy as these uncertainties are resolved (at least partially). Structuring the discretion through the scheduled reporting and Presidential recommendation process can ensure that businesses and households can anticipate and credibly predict the evolution of U.S. carbon tax policy.

This structured discretionary approach could complement or substitute for a rules-based approach to addressing uncertainty, such as the Prof. Metcalf and Dr. Hafstead et al. proposals.[54] The rules-based approaches have the appeal of implementing automatic adjustments in response to new information, such as the failure of national emissions to meet a specified emission goal. The limitation of rules-based approaches, however, is that they cannot address all types of uncertainty. For example, the adjustments envisioned in the Hafstead et al. proposal would address downside uncertainty in the mitigation

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[53] For proposals on coordinating domestic carbon prices in a multilateral climate change agreement, see generally Richard N. Cooper, *The Case for Charges on Greenhouse Gases*, *in* POST-KYOTO INTERNATIONAL CLIMATE POLICY: IMPLEMENTING ARCHITECTURES FOR AGREEMENT 151–78 (J.E. Aldy & R. N. Stavins ed. 2010); Martin L. Weitzman, *Internalizing the Climate Externality: Can a Uniform Price Commitment Help?*, 4 ECON. ENERGY & ENVTL. POL'Y 37 (2015).

[54] *See* Metcalf, *supra* note 9; Hafstead et al., *supra* note 10.

response to a given carbon tax. These adjustments would not reflect fundamental changes in climate science and climate change damages. In theory, one could expand the dimensions of the carbon tax schedule to account for additional types of uncertainty, but such complexity risks complicating and undermining the administrative simplicity and predictability of a carbon tax. Given the fundamental problem of uncertainty, it is impossible for a policymaker to imagine all possible states of the world and establish conditional tax rates for each of these possibilities. A structured discretionary approach could be more flexible to address various types of uncertainty, and to do so on a predictable schedule. Of course, since the structured discretionary approach depends on a recommendation of the President and affirmative action by each chamber of Congress, then various political factors could influence the evolution of the carbon tax beyond simply the fundamentals reviewed in the EPA, Treasury, and State reports to Congress. A reluctant President or Congress could opt against raising the tax rate (level or annual growth rate), even if this occurred in the presence of a rules-based approach.