December 5, 2019

Chairman Paul Tonko
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on the Environment and Climate Change
Washington DC 20515

Ranking Member John Shimkus
United States House of Representatives
Committee on Energy and Commerce
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Dear Chairman Tonko and Ranking Member Shimkus,

Please accept this letter as part of the record for the hearing on "Building a 100 Percent Clean Economy: Solutions for Economy-Wide Deep Decarbonization."

Thank you for the opportunity to submit written testimony on the critical need for economy-wide policy solutions to ensure dramatic reductions in climate pollution and put the United States on the path to a 100% clean economy by mid-century.

The Goal: A 100% Clean Economy

The impacts of climate change are already being felt in communities across the United States. If we fail to act to reduce climate pollution, the costs—to the American economy, to public health, and to the environment—will be enormous. The latest science tells us that to avoid the worst impacts of climate change, the United States must reach net zero emissions across the economy—emitting no more climate pollution than we can remove—no later than 2050. That is what we mean by a 100% clean economy.

The transformative changes needed to achieve this goal will require equally ambitious policy solutions that can drive dramatic emissions reductions across all of the major emitting sectors of the economy, including electricity, industry, buildings, transportation, and land use. While the U.S. electricity sector is making progress towards beginning this transition, other sectors are currently lagging behind. Emissions from transportation, buildings, and industry each rose in 2018. Absent new policies, total energy-related carbon dioxide emissions are projected to remain flat into the future and even to start rising by mid-century—even as the science tells us they must fall rapidly.[1]

[1] 2018 emissions data from Rhodium Group, Final U.S. Emissions Estimates for 2018, May 2019, https://rhg.com/research/final-us-emissions-estimates-for-2018/; projections from U.S. Energy Information Administration, Annual Energy Outlook 2019, January 2019, Table 18, https://www.eia.gov/outlooks/aeo/.

To address the climate crisis, we must accelerate decarbonization in the electricity sector and reverse rising emissions in other sectors by shifting from carbon-intensive fuels and activities to those that produce low, zero, or even negative emissions. And we must do that at an unprecedented pace and scale.

Achieving the Goal: A Portfolio Approach

Comprehensive federal climate legislation can meet this challenge by mobilizing investment and action throughout the American economy—and holding us accountable to the goal. Achieving a 100% clean economy will require a portfolio of policies designed to address key barriers, challenges, and objectives including:

- spurring technology innovation;
- delivering just and equitable outcomes for all Americans;
- addressing barriers to clean energy and energy efficiency in specific sectors;
- supporting farmers and forest landowners in reducing emissions and increasing resilience to climate change;
- cutting emissions of other greenhouse gases, such as methane; and
- strengthening the nation's infrastructure.

The centerpiece of the portfolio should be an economy-wide approach that taps the fastest and cheapest reductions available, while creating incentives for the research, development, and deployment of the next generation of low-carbon technologies. Designed well, such a core mechanism can serve as a magnet that aligns efforts to cut pollution across the entire economy, making complementary policies cheaper and easier to achieve and moving us more rapidly towards the 100% clean goal.

This letter lays out reasons why an economy-wide approach is vital to achieving a 100% clean economy by 2050, and outlines several options for the design of such a policy.

The Centerpiece of the Portfolio: An Economy-Wide Core Mechanism

The centerpiece of comprehensive federal climate legislation should be a core policy mechanism that ensures dramatic reductions in climate pollution across the U.S. economy in order to meet the 100% clean goal. This mechanism should cover as much of the economy as practicable, recognizing that some sources are too diffuse, too hard to measure, or too small to be covered. An economy-wide mechanism can:

> **Maximize emissions reductions**: Broad emissions coverage is critical because emissions come from many sectors of the economy and a policy that exempts one or more of these sectors, especially sectors that contribute significant emissions, undercuts the effectiveness in achieving overall reduction goals.
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> **Ensure consistent signals to drive reductions across sectors**: Excluding major emissions sources can create perverse incentives for some sources of emissions to shift from covered to uncovered sectors, undermining overall environmental performance. Covering the vast majority of missions ensures that each sector is facing the same incentives to reduce emissions and no sectors or industries are disproportionately burdened.
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> **Tap the lowest-cost reductions:** Broad emissions coverage is also critical to achieve emissions reductions cost-effectively. Since costs for mitigation vary within and between

sectors, broader coverage ensures that businesses retain the flexibility to pursue the cheapest reductions first and that no opportunities are left on the table—a critical precondition for minimizing the overall costs of climate legislation.

Drive clean investment and innovation: Aligning incentives for reductions across the economy will help spur the development of essential innovative technologies across various parts of the economy, while orienting investments in all sectors towards deployment of a broad portfolio of low-carbon technologies. Well-designed policy can play a critical role in ensuring that promising next-generation technologies become cheap enough to deploy at scale—and their effect will be most powerful if the policy covers all of the major emitting sectors where new technologies are needed.

Improve public health and quality of life for all communities: The core mechanism should be designed to improve public health and quality of life for all communities and distribute costs and benefits in a way that promotes equity. Economically disadvantaged communities and communities of color have been exposed to disproportionate levels of toxic pollution and also stand to be the first and worst hit by — and the least prepared for — the costs and impacts of climate change. Climate policies should address environmental justice, provide transparency, promote affordability, and give a voice to and commit to benefitting American workers, disadvantaged communities, and those most directly affected by climate change and the transition to a cleaner economy.

Three options for a core policy mechanism are:

1. *An enforceable nationwide pollution limit:* Congress sets a legally enforceable limit on total climate pollution from fuel combustion and industry – amounting to about 85% of U.S. greenhouse gas emissions. That limit gets tighter over time, reaching net zero emissions by 2050 at the latest. The policy should provide individual sources with flexibility over how to meet the nationwide limit, along with economic incentives to spur deep reductions as soon as possible and at the least cost.

2. *A carbon fee with climate backstops:* Congress enacts a fee on all climate pollution from fuel combustion and industry, again comprising roughly 85% of U.S. greenhouse gas emissions. To ensure that we meet the 100% clean goal, a declining pollution pathway consistent with net zero emissions by 2050 should be established, along with regular assessments of performance. If emissions are above the pathway, the fee automatically increases, providing a climate backstop. If the fee still does not produce the needed results, EPA would be directed to issue regulations to meet the goal.

3. *A statutory goal of a 100% clean economy by 2050 with direction to federal agencies to act:* Congress establishes a national goal of net zero emissions by 2050 and directs EPA, with support from other federal agencies, to meet it. This could be achieved either through direct federal rules or through state action with federal guidelines, oversight, and backstop provisions.

Ensuring Emissions Reductions: The True Measure of Success

The ultimate measure of success for any climate policy is reducing climate pollution. To that end, the core mechanism must provide clear accountability for and enforceability of emissions reductions. In this way, it can serve as a safety net to ensure that overall emissions decline on a time scale in line with what the science tells us is necessary.

A policy that establishes a legally enforceable limit on the total quantity of allowable climate pollution (option 1 above) can guarantee results. In the context of a carbon fee (option 2), however, some form of "climate backstops" are essential to ensure reductions consistent with achieving net-zero emissions by 2050.[2]

A carbon fee sets a price per unit of pollution, which provides an incentive for businesses and households to reduce emissions. But a pure tax lacks an explicit connection to performance, as measured by emissions, and therefore provides no assurance that the required reductions will actually be achieved. We know that emissions will fall as a result of a carbon fee, but even the most robust economic modeling cannot provide certainty about how big the decline will be. Fundamental factors like energy or economic market dynamics can change over time, affecting the performance of a tax. Because greenhouse gases accumulate in the atmosphere over time, even being slightly off the desired path over several decades can produce significant consequences for cumulative emissions, and thus climate damages. A pure tax also cannot ensure that the U.S. meets its commitments under the Paris Agreement.

To address this inherent uncertainty, any carbon fee policy should include climate backstops, also known as "environmental integrity mechanisms" (EIMs). Climate backstops link a carbon fee to specified pollution reduction goals and provide mechanisms to help the program stay on course for meeting those goals. Such measures have been included in several recent federal carbon fee proposals, including the MARKET CHOICE Act and the Energy Innovation and Carbon Dividend Act (both introduced in the 115th Congress and updated and reintroduced in the 116th Congress) and the Stemming Warming and Augmenting Pay (SWAP) Act and the Climate Action Rebate Act (both introduced in the 116th Congress).[3]

Most notably, one type of climate backstop (included in all the bills above) is a mechanism that increases the fee automatically if the tax has not been sufficient to drive emissions down to the specified emissions reduction goals outlined in the legislation. Such an approach allows the carbon fee to adjust quickly, transparently, and predictably, helping to keep the program on track to ensure the necessary emissions reductions are achieved. Additional climate backstops, including direction to EPA to issue regulations to meet the emissions goals, should be included in the event that automatic fee increases still do not produce the needed results. In addition, excess revenues (which will be higher than projected if emissions goals are not met) could be used to drive additional abatement.

Market-Based Policies: A Cost-Effective Solution

Cost-effective emissions reductions allow for greater ambition on a faster timeline

Given the urgency of the climate challenge, Congress should put in place policies that can help us transition as swiftly and as dramatically as possible, while ensuring affordability for all Americans. Leveraging cost-effective solutions will be vital to achieving the 100% clean goal, since they can drive greater emissions reductions on a faster timeline—while simultaneously reducing the overall cost to American businesses, industries, and consumers.

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[2] Read more about EDF's work on climate backstops here: http://blogs.edf.org/markets/2016/11/03/ensuring-environmental-outcomes-from-a-carbon-tax/ and http://blogs.edf.org/climate411/2018/12/18/a-growing-call-for-environmental-integrity/

[3] See: MARKET CHOICE Act (H.R.6463, 115th Congress; H.R.4520, 116th Congress); Energy Innovation and Carbon Dividend Act (H.R.7173, 115th Congress; H.R.763, 116th Congress); Stemming Warming and Augmenting Pay (SWAP) Act (H.R.4058, 116th Congress); Climate Action Rebate Act (H.R.4051/S.2284, 116th Congress).

Evidence shows that flexible market-based policies that set enforceable, declining limits on pollution and let businesses find the best ways can achieve emissions reductions at far lower cost than alternative policies. For instance, studies suggest that carbon pricing policies can be up to 14 times cheaper than sector-specific standards at achieving the same amount of reductions.[4] Each of the three options for core policy mechanisms described above can be implemented in a way that provides flexibility and creates incentives to reduce emissions as cost-effectively as possible.

Revenues raised can fund critical environmental and equity priorities

A carbon price of $50 per ton, rising at 5% annually (above inflation) could raise roughly $2.5 trillion over a decade; a cap-and-trade program with auctioned allowances could yield a similar amount. This revenue could be used to meet a range of objectives, including protecting low-income families from changes in energy costs[5] and vulnerable communities from the impacts of climate change; funding job and worker transition programs; investing in clean energy innovation and technologies that will be critical to achieving net-zero emissions by 2050; and ensuring cleaner air and investment in communities that have historically borne a disproportionate burden of pollution.

Modeling shows that revenues from a carbon price can be distributed in ways that improve economic welfare for the lowest income households.[6] When deciding how to invest revenues from a carbon price, policymakers should give a voice to and commit to benefiting American workers, historically disadvantaged communities, and communities and workforces most directly affected by climate change and the transition to a 100% clean economy.

Market-based policies have proven to be extremely effective in practice

Cost savings and revenues raised from well-designed market-based policies can also be channeled into additional reductions, creating opportunities to increase ambition and improve environmental outcomes over time. In California, for example, billions of dollars in revenues from the state's cap-and-trade program have been reinvested in programs and policies that achieve further emissions reductions beyond the cap, including rebates for electric vehicles and solar installations, investment in low-carbon transportation, and emissions reductions from natural and working lands.[7] Similarly, revenues from the Regional Greenhouse Gas Initiative (RGGI), the cap-and-trade program covering emissions from electric power generation in nine northeastern states, have been reinvested in energy efficiency, renewable energy, and electricity bill assistance for consumers. RGGI investments from 2017 alone are expected to drive additional lifetime carbon reductions of 8.3 million short tons and deliver $1.4 billion in energy savings to consumers.[8] The demonstrated benefits and low cost of emissions reductions under RGGI contributed to participating states' decision in 2017 to increase the ambition of the program by further lowering the cap between 2020 and 2030 by 30%.[9]

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[4] These results are sensitive to the modeling of pre-existing tax distortions. See Pizer et al. (2006). Modeling Economy-Wide vs Sectoral Climate Policies Using Combined Aggregate-Sectoral Models. *The Energy Journal* 27(3), 135–68. https://www.jstor.org/stable/23296994?seq=1. See also, Karplus et al. (2013, March 1). Should a Vehicle Fuel Economy Standard Be Combined with an Economy-Wide Greenhouse Gas Emissions Constraint? Implications for Energy and Climate Policy in the United States. *Energy Economics* 36, 322–33.

[5] For example, see https://www.cbpp.org/research/climate-change/the-design-and-implementation-of-policies-to-protect-low-income-households.

[6] Resources for the Future. (2019, September). Carbon Pricing Calculator. *RFF.* https://www.rff.org/cpc/.

[7] California Climate Investments, "2019 Annual Report: Cap-and-Trade Auction Proceeds," March 2019, caclimateinvestments.ca.gov.

[8] The Regional Greenhouse Gas Initiative, "The Investment of RGGI Proceeds in 2017," October 2019, https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2017.pdf.

[9] Regional Greenhouse Gas Initiative, "Summary of RGGI Model Rule Update," December 19, 2017, https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Summary_Model_Rule_Updates.pdf.

Market-based policies for reducing pollution have proven to be extremely effective in practice:

- ✓ With California's cap-and-trade policy in place, emissions fell below the state's 2020 target of reducing emissions to 1990 levels four years early and emissions continue to decline.[10] Meanwhile the state's GDP has grown at a faster rate than the rest of the country.[11]
- ✓ RGGI states have seen carbon dioxide emissions fall 47% since the program began (90% faster than the rest of the country) while electricity prices have fallen 5.7% and GDP has grown 47% (31% faster than the rest of the country).[12]
- ✓ The sulfur dioxide (SO2) trading program created by the 1990 Clean Air Act Amendments (also known as the Acid Rain Program) is another key example of a market-based pollution pricing program that was extremely successful at achieving its environmental aims – and the health and other benefits of the program greatly exceeded the costs.[13] Moreover, these costs were lower than originally forecast and are estimated to be at least 15% and up to 90% less than they would have been under a more prescriptive standard.[14]

Together, these examples provide real-world evidence that market-based policies can drive ambitious climate pollution reductions quickly, while allowing for economic prosperity – underscoring that they are a critical part of the solution set needed to reduce climate pollution at the pace and scale required to avert the worst impacts of climate change.

I thank the Committee for the opportunity to submit this letter on the critical need for economy-wide solutions to ensure dramatic reductions in climate pollution from across the U.S. economy. I look forward to working with members of the Committee on the development of comprehensive national climate legislation that achieves the goal of a 100% clean economy.

Sincerely,

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Senior Vice President, Climate
Environmental Defense Fund

cc:
Chairman Frank Pallone, Jr
Ranking Member Greg Walden

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[10] Environmental Defense Fund, "Cutting Carbon and Growing the Economy: A Decade of Cap-and-Trade Success in California" (Environmental Defense Fund, n.d.), https://www.edf.org/sites/default/files/cutting-carbon-growing-economy.pdf. See also, http://blogs.edf.org/climate411/2019/08/27/california-and-quebecs-august-auction-clears-after-emissions-below-2020-target-for-second-year-running/.

[11] California Air Resources Board, "California's 2017 Climate Change Scoping Plan," November 2017, https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

[12] Acadia Center, "The Regional Greenhouse Gas Initiative: 10 Years in Review," 2019, https://acadiacenter.org/wp-content/uploads/2019/09/Acadia-Center_RGGI_10-Years-in-Review_2019-09-17.pdf.

[13] Shadbegian, R.J., Gray, W., & Morgan, C. (2007). Benefits and Costs From Sulfur Dioxide Trading: A Distributional Analysis. *Acid in the Environment*, ed. Gerald R. Visgilio and Diana M. Whitelaw. Boston, MA: Springer US, 241–59. https://doi.org/10.1007/978-0-387-37562-5_13

[14] Schmalensee, R. & Stavins, R. N. and Robert N Stavins. (2013, February). The SO2 Allowance Trading System: The Ironic History of a Grand Policy Experiment. *Journal of Economic Perspectives* 27(1), 103–22. https://doi.org/10.1257/jep.27.1.103