Energy and Commerce Committee Questions

1. **What are the key policy, regulatory, and market considerations that should inform the development of comprehensive climate legislation? Please provide specifics.**

To design comprehensive national climate legislation, it's imperative to clarify the policies' objectives. We suggest six. First, the policy must reduce US emissions consistent with science-based targets, as these matter both in their own right and for the US to retake leadership of this critical global issue. Second, to truly stabilize climate risk, the policy must also stimulate global reductions as the US only accounts for 15% of the global total. The US cannot solve the climate crises alone. Third, the policy should be efficient, so that targeted reductions are achieved at minimal cost. In the long run, the less it costs to reduce emissions, the more reductions will be achieved, and the more popular and sustainable the program will be. Fourth, the policy should spur US innovation to seize the economic opportunity presented by the expanding global market for low carbon technologies. Fifth, the policy should not burden low-income households, as they are most vulnerable and suffer most from the effects of climate change. Finally, the policy should be politically feasible, as it is imperative that we begin reducing emissions soon. We believe these objectives may be achieved with a sensible climate policy and that many or all are fulfilled in bills now before the House. We discuss each policy criteria below.

Significantly Reduce US Emissions – Emissions can be significantly reduced through a carbon price (*e.g.*, cap and trade, or carbon fee), regulations (CAFE, RPS, CPP, performance standards), or a combination of these, and such policies can be enhanced through subsidies (extenders) or by funding R&D. We will discuss the effectiveness of pricing carbon[1] here as this is the most efficient approach (see discussion below), is strongly preferred by economists, and will soon cover 20% of global emissions according to the World Bank (see page 14 of the reference).

Economic analysis makes clear that applying a carbon fee on fossil fuels in the US could go a long way to greatly decarbonizing the US economy. The below chart contains the results from 11 top peer-reviewed models in a 2018 study (see page 10 of the reference) that shows an average of 30% reductions over 15 years from a carbon fee alone. A recent paper out of MIT found that a carbon tax of just $7/ton in 2020 rising to $36/ton by 2030 would generate the same emission reductions as the CAFE, RFS and CPP regulations combined.

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[1] We focus on revenue neutral carbon tax policies, as opposed to Cap & Trade, as there are several bills before Congress (discussed below) and CCL provided a lengthy discussion of the advantages of a carbon tax over cap and trade to Representative Tonko's office in 2018. A good discussion of the effectiveness of both approaches can be found here.

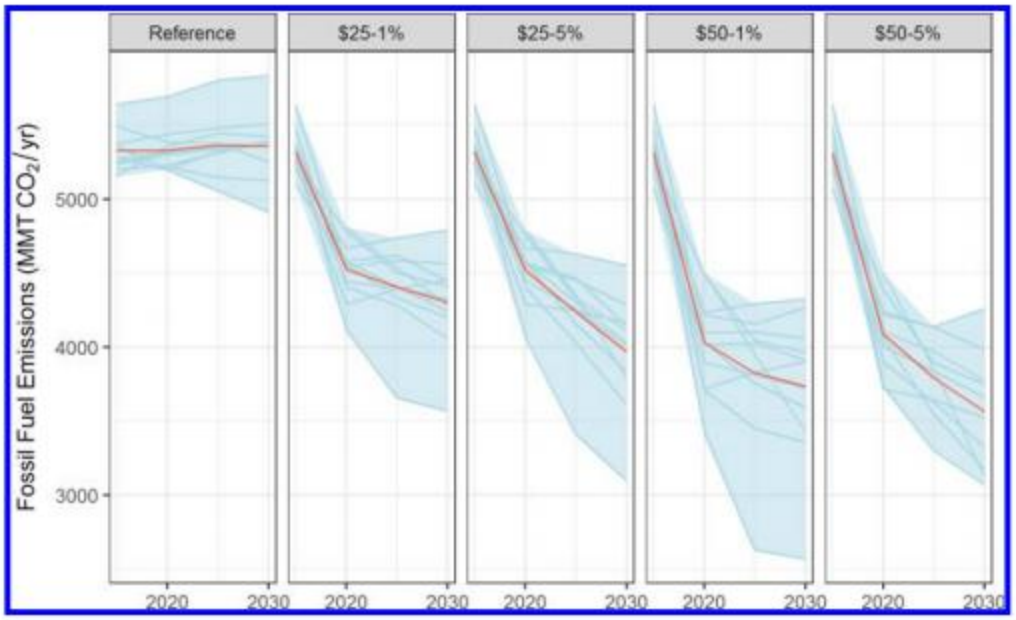
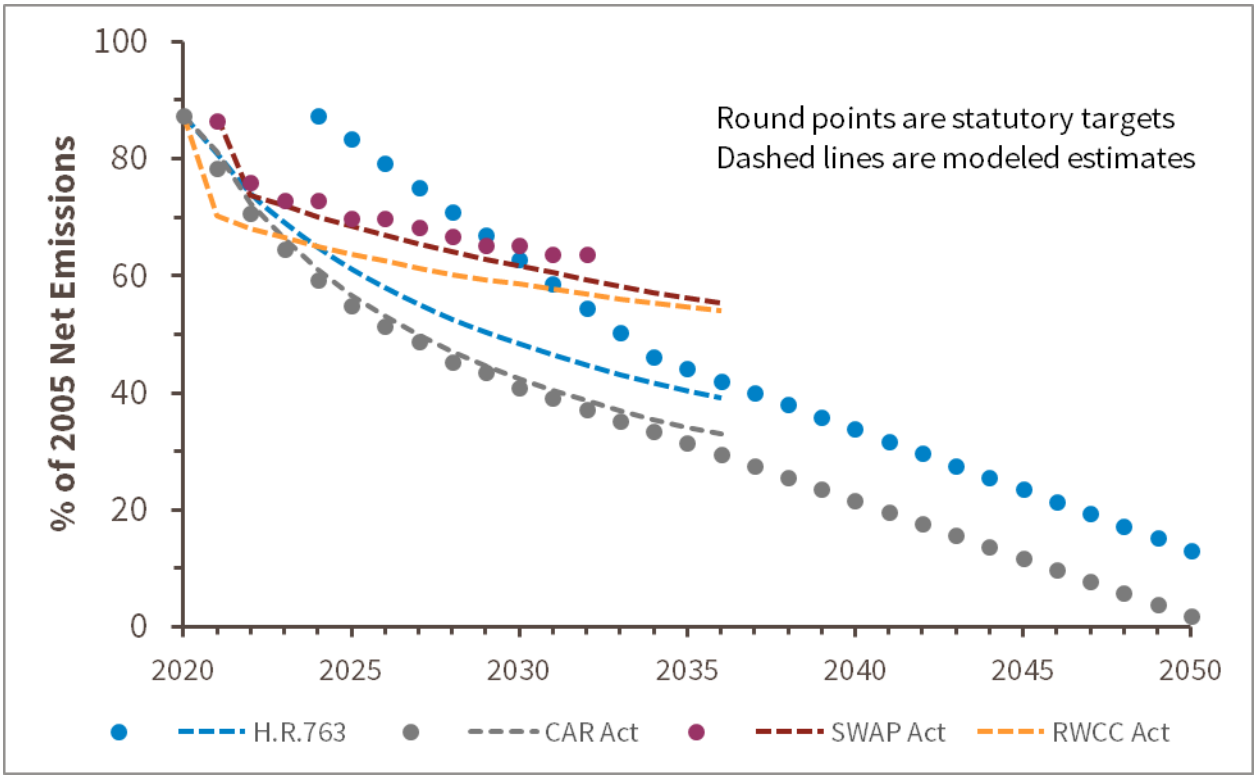


Figure 1. Annual fossil fuel emissions levels (MMt CO_2) by year under the reference case and the four core carbon tax trajectories. For this and subsequent figures, the red lines show the average values across the models, the blue shaded area shows the range of model results, and the individual model trajectories appear in blue. For better readability, the vertical axis here does not start at zero. As mentioned in Sec. 1, model identity is generally not relevant to our conclusions here and so individual models are not identified. Note that the model with the most aggressive reductions did not report results for the $50–5% scenario, which explains the deeper maximum reductions in the $50–1% scenario.

The chart below shows the estimated reductions from four different carbon pricing bills that are now before Congress. The bills modeled are HR 763 (Energy Innovation Act, now with 62 cosponsors), HR 4051 (Climate Action Rebate Act), HR 4058 (the Stemming Warming and Augment Pay Act) and HR 3966 (the Raise Wages and Cut Carbon Act). The key characteristics of each bill are compared in Appendix A, below. The modeled emissions are from Resources for the Future's (RFF) GH-E3 model (one of the 11 models in the study above) and are relative to 2005 levels (emissions are now roughly 88% of those levels). The dashed lines reflect estimated reductions while the dotted lines reflect statutory targets that prompt further carbon price increases or regulatory action if they are not met. Emission reductions are estimated at roughly 40% to 60% below 2005 levels by 2036, with statutory targets equal to 90% to 100% reductions by 2050.



Stimulating Global Emission Reductions – A key way to ensure the policy stimulates global emission reductions is to include a "border carbon adjustment," or BCA, which each of the bills modeled above does. A BCA creates a level playing field internationally by charging imported products a like carbon fee upon entry if that country does not have a similar one. This ensures domestic firms' competitiveness is not diminished as a result of the policy. Likewise, it also rebates a like fee on exports for the same reason. Foreign countries thus have a clear incentive to enact a similar fee in their own country to avoid an import charge in the all-important US market.

It is important to recognize the global context in which the policy would be implemented. Much of the world, including our biggest trading partners, are already pricing carbon. As discussed, 20% of global emissions are subject to a carbon price, and 75% (see exhibit 4s of the reference) of US imports are from countries that price carbon. Should the United States act to catch up with the established policies of our peers, it is more likely this serves to increase the ambition of their efforts than to decrease it.

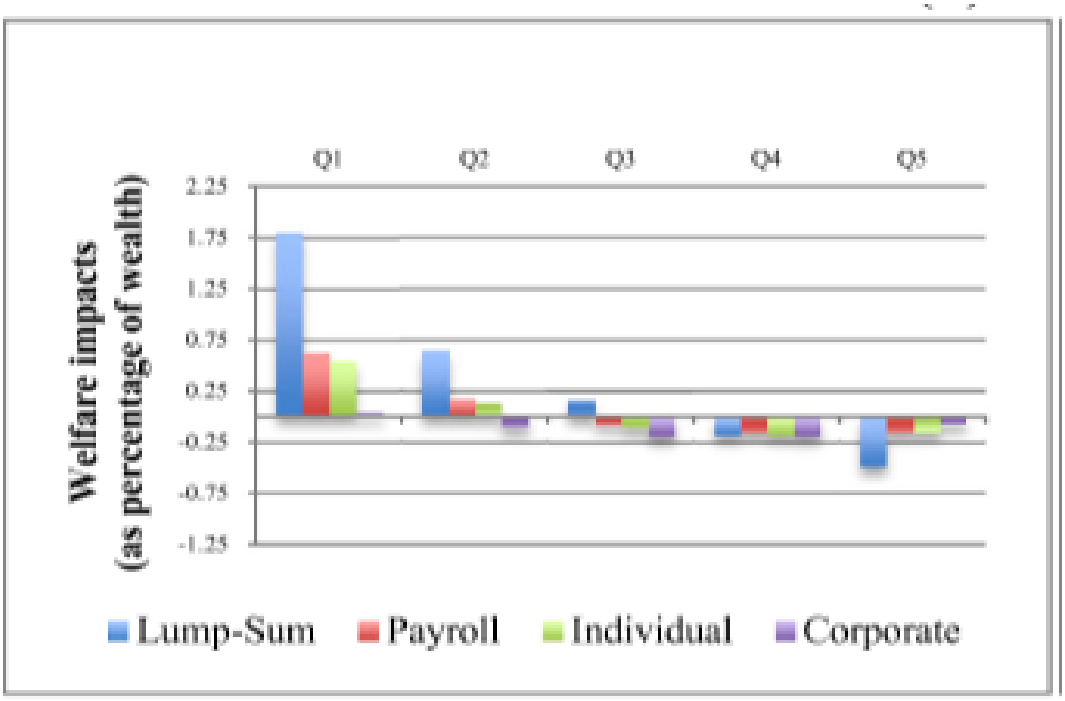
Efficiency: Achieving Reductions at Minimal Cost – Achieving targeted emissions reductions at least cost will make the policy more popular over the long term and therefore lead to greater reductions. Economists have established that using a pollution price is far more efficient than regulations for achieving reductions by giving all producers and consumers a financial incentive to reduce emissions and the flexibility to achieve them in the least-cost manner.

Seize the Economic Opportunity – Though government funding of R&D clearly has a role to play, the most impactful way to stimulate substantial investment in low carbon technologies is with a strong, predictable carbon price. This would provide an enhanced return for investors that is consistent with the value of the products produced, and would generate a level of new

private investment that should be far greater than what the government should provide. (Indeed, the private sector is well-suited to leverage publicly funded R&D that has already passed laboratory and pilot development.) The breakthrough technologies deployed from this investment will both lower the cost of reducing emissions *globally*, and create a multitude of good US jobs in what is likely to become the fastest growing international market of the 21st Century. *It is our knack for innovation that has generated strong economic growth and made the US economy the envy of the world: let's apply it toward solving the greatest challenge of our generation while reaping the corresponding economic windfall.*

A carbon fee is far preferable to cap and trade on this front. Cap and trade programs have yielded uncertain and volatile carbon prices, greatly diminishing the financial incentive to invest. For example, in both California and the EU, carbon prices have fallen or remained low for an extended period. The significant capital investment required for more transformative innovation will only be incented by a strong, reliable carbon price. Fortunately, the four bills modeled above contain this feature.

Do Not Burden Low Income Households – The latest research indicates that most revenue neutral carbon taxes that return all funds back to the economy actually provide a financial benefit to the poor (see chart below, page 63 of the reference). Specifically, when funds are returned either directly to households (lump-sum), via payroll tax or individual tax rate reductions, the bottom two US income quintiles receive a financial benefit, though the lump-sum payments to households is by far the most progressive policy. Once again, each of the four bills discussed generally takes one of these approaches. In contrast, MIT research indicates current regulations that reduce emissions tend to be regressive, so that a disproportionate financial burden falls on the poor. This provides a strong argument for relying on a pollution price as the foundation for any climate policy.



Politically Feasible – We have good evidence that a carbon fee policy in which all funds are returned to the economy will be effective at reducing emissions, can spur global reductions to reduce climate risk, will achieve reductions at least cost, will not harm the economy (and may even boost it) while it reduces climate and health risks, and will provide a financial benefit to the poor. Further, as noted above, this general approach has been endorsed by 3500 economists, including 27 Nobel Prize winners and all living former Federal Reserve Chairs. And when this approach has been implemented, as it has in British Columbia (BC), it has been popular. Finally, four bills taking this general approach have been introduced into the House, three on a bipartisan basis, and one of those now has 62 cosponsors. So it appears we are getting closer to understanding the type of policy that could work.

And the time may be ripe for Republicans to embrace a market-based solution to climate change that does not grow government. In June, pollster Frank Luntz released results from a poll showing fully 58% of Republicans under 40 are more concerned about climate change than they were just one year ago, and 55% said they were "very or extremely" concerned about their parties position on climate change. Further, 69% of all GOP voters were concerned that the party's stance on climate change is "hurting itself with younger voters."

With some Republican support, the climate policy will be far more "stable," reflecting Representative Tonko's 9th Principal of National Climate Action. He states that "Federal climate action must create steady, credible, and politically durable policies, send strong investment signals, and deliver long-term certainty to allow for proper planning and implementation while minimizing compliance costs." For policies to be politically durable, they must enjoy reasonably broad support on both sides of the aisle. This will provide comfort to other major global emitters that the policy will not be attacked and diminished after the next election cycle. To attract sufficient Republican support, the policy should return most or all of the funds back into the economy via either tax cuts or carbon dividends and to minimize any new government programs or administrative expenses. Other useful components of climate policy, such as funds for R&D, subsidies and performance standards may need to be part of a separate effort to keep the foundational legislation as clean and simple as possible.

Finally, conservative support may be enhanced through targeted funding or exemptions. Though there is no indication rural communities are disadvantaged by this type of policy, BC has utilized a small property tax credit for rural households that helped win support within this community. Further, HR 763 has carbon fee exemptions easing the burden on agriculture and the military that are appreciated by those constituencies. In sum, the net benefits of an efficient revenue neutral carbon fee are so positive, limited funds can be directed to those disadvantaged while allowing the policy to generate tremendous climate, health, economic and even regulatory benefits.

2. **Please describe any innovative concepts for climate policy design, including both sector-specific and economywide measures, that you believe the Committee should consider.**

One innovative mechanism discussed in the literature and prevalent in the bills before the House is an environmental integrity mechanism (EIM). As discussed here, these can be added to a policy to ensure science-based emission reduction targets are met. Specific provisions can include increased carbon prices, regulation, subsidies, or other vehicles that will prompt further reductions.

One way to utilize EIM's is to design a policy that features a specified and certain carbon price in combination with EIM's that provide the desirable emission reduction certainty similar to an emissions cap. For example, HR 763 contains two EIM's. First, the annual carbon price change increases from $10 to $15 per ton of CO_2e if targets are not met. As a backstop, if the enhanced price increases are not sufficient to meet emissions targets, the bill requires the EPA to step in and proscribe regulations to ensure the targets are met.

The approach of increasing ambition when science-based targets are not met without the need for an additional act of Congress is desirable, and opportunities to include such EIM's in policies in addition to carbon pricing should be pursued.

3. **If you work in, advise, or are familiar with sectors that are particularly challenging to decarbonize, have you identified any effective (and scalable) solutions that should be included in comprehensive climate legislation?**

Our research and that of other researchers with whom we communicate reveal the two most important sectors that are challenging to decarbonize are transportation and building heating.

The U.S. has over 250 million cars and light trucks on the road, [1] more than 99 percent of which burn gasoline, diesel fuel, or natural gas, [2,3] in spite of rapid growth in electric vehicles. Even in the most optimistic scenario, electrifying that huge private fleet as well as providing the additional power generation and charging infrastructure needed to keep them on the road, will take many decades. One straightforward complement to electrification is to decarbonize the *fuels* those existing vehicles burn. The U.S. Department of Energy's Energy Efficiency and Renewable Energy (EERE) division has already conducted a lot of groundbreaking R&D on integrated biorefineries, [4] many of which can make "drop-in" fuels to directly replace gasoline or diesel fuel while reducing GHG emissions by 88 percent or more. [5]

A similar situation exists with fuels for heating homes and commercial buildings. About 60 million U.S. buildings are currently heated with natural gas, [6] and electrifying all of them to make use of renewable electricity will be another massive, slow, and difficult transition. Renewable natural gas (RNG) made from biomass sources [7,8] can lower GHG emissions from the gas that already fills those pipelines.

Scientists tell us that the most important consideration in drawing down GHG emissions is to get started as quickly as possible. The U.S. DOE has already done a tremendous amount of work developing technologies to achieve this, but they sit on the shelf because there is no policy to make them economically competitive. Billions of dollars of taxpayer money has already been sunk into these programs, producing a treasure trove of engineering data. A steadily rising carbon price would incentivize private investors to seek out and harvest all this accumulated knowledge to put these technologies, and many others, into practice.

4. **If your organization has adopted carbon pollution reduction goals, how have those goals – or your plans to meet those goals – evolved over the last decade?**

As CCL/CCE is focused on policy advocacy and research, our goal is to maximize the potential to meet national goals. Over the last decade, we adopted a goal of advancing legislation to achieve 90 percent national GHG reduction by 2050. At the beginning of the decade, the general consensus in the climate science community was to target 80 percent reductions to fit a global goal of staying below 2°C over preindustrial temperature. But as the indicators suggested

that this would be inadequate, in 2010 we extended our legislative goal to 90 percent, in anticipation of findings that 80 percent would not be enough. This was borne out, and even exceeded, in 2018 with the IPCC SR1.5 report, which recommends 100 percent net decarbonization by 2050.

5. **If applicable, what actions has your organization already taken, or do you plan to take, to reduce carbon pollution?**

Our goal has always been to build the political will for strong, effective, and transparent carbon pricing as the best first step towards deep reduction in GHG emissions. CCL/CCE has been instrumental in engaging lawmakers to introduce strong carbon pricing legislation, H.R.763 The Energy Innovation and Carbon Dividend Act.

6. **What have been the challenges or barriers to making meaningful carbon pollution reductions, and how have you responded to those challenges or barriers?**

The major barrier to carbon pollution reduction remains, as it always has been, the fact that fossil fuels don't internalize the costs to society of the damage they do. As long as fossil fuels *appear* to be the cheapest form of energy – because their true costs are not reflected in market prices – someone somewhere will burn them. Some activists complain that carbon taxes have failed to pass or been repealed in many jurisdictions, and therefore should be abandoned. This complaint fails to recognize the reason that it has been difficult to pass effective carbon pricing: because it would work.

7. **How can the Federal Government assist you in reducing carbon pollution?**

As CCL/CCE is a volunteer advocacy organization, not a fossil fuels producer or user, this question is not relevant to our operations.

8. **Are there any additional comments or feedback you would like to add?**

The U.S. government, particularly the Department of Energy, has funded a tremendous amount of world-class research into technologies that can address climate change. A large amount of this knowledge sits on the shelves – and trillions of dollars of potential private investment sits on the sidelines – because the economic conditions to make these technologies attractive to private investors don't exist, and will not exist until fossil fuel prices reflect their true cost. That's why strong, transparent carbon pricing is so vital.

Appendix A – Comparison of Selected Current Carbon Pricing Bills

Title	Energy Innovation & Carbon Dividend Act		Climate Action Rebate Act		Raise Wages, Cut Carbon Act		Stemming Warming & Augmenting Pay Act	
House bill # **Sponsors (lead + D + R)**	H.R.763 Deutch + 60 + 1		H.R.4051 Panetta + 1 + 0		H.R.3966 Lipinski + 0 + 1		H.R.4058 Rooney + 1 + 0	
Senate bill # **Sponsors (lead + D + R)**	--		S.2284 Coons + 1 + 0		--		--	
Carbon Pricing Design								
Start year	2020		2020		2020		2021	
Covered fuels	Coal, crude oil, natural gas, & their products		Coal, crude oil, natural gas, & their products, & solid biomass [2,3]		Coal, petroleum & its products, & natural gas		Coal, refinery products, natural gas, process GHG's, biomass & biofuels [4]	
Starting price, $/mt CO_2e	$15		$15		$44 [5]		$30	
Annual increase, $/mt CO_2e	+ $10 + CPI		+ $15 + CPI		+ 2.5% + CPI		+ 5% + CPI	
Missed-targets increase	+ $5		+ $15		--		+ $3 @ 2 years	
F-gases taxed	Yes, 10% of GWP		Yes, 20% of GWP		Yes, 10% of GWP		Uncertain [6]	
CCUS[7] credits/refunds	Yes (fossil only)		Yes		Yes (fossil only)		Yes (fossil only)	
Emissions reduction [8]	Target	Model	Target	Model	Target	Model	Target	Model
10 years	37%	52%	59%	58%	None [11]	41%	36%	39%
15 years	56%	60%	71%	67%	--	45%	--	45%
30 years	89% [9]	--	100%[10]	--	--	--	--	--

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2 Not including "gases and liquids recovered from the decomposition of" biomass.
3 CO_2e equivalence to be set by EPA based on life cycle GHG emissions.
4 CO_2e equivalence to be set by EPA based on life cycle GHG emissions.
5 Carbon price is set in short tons, not metric tons, starting at $40 per short ton.
6 Bill test specifies "ozone-depleting substances" but not clear if that covers HFC's of concern.
7 CO_2 capture & utilization or sequestration.
8 Relative to 2005 emissions. Modeling is from Resources for the Future. Targets are statutory.
9 Carbon fee is frozen when emissions drop by 90% from 2016 levels.
10 Carbon fee is frozen when emissions drop by 90% from 2017 levels.
11 Carbon fee is frozen when emissions drop by 80% from 2005 levels.

Title	Energy Innovation & Carbon Dividend Act	Climate Action Rebate Act	Raise Wages, Cut Carbon Act	Stemming Warming & Augmenting Pay Act
House bill # **Sponsors (lead + D + R)**	H.R.763 Deutch + 60 + 1	H.R.4051 Panetta + 1 + 0	H.R.3966 Lipinski + 0 + 1	H.R.4058 Rooney + 1 + 0
Revenue Allocation [12]				
Treasury general fund	--	--	25%	25%
Dividends	100% (taxable) [13]	70% [14] (taxable)	--	--
Payroll tax cut	--	--	63%	52.5%
Soc Security benefits	--	--	7.5%	7.5%
LIHEAP and WAP programs	--	--	4.5% [15]	--
Low-income block grants	--	--	--	7.5%
Infrastructure	--	20% [16]	--	--
Climate adaptation	--	--	--	7.5%
Carbon sequestration	--	--	--	
Energy efficiency	--	--	--	
R&D	--	5%	--	
Transition assistance	--	5%	--	--
Border Adjustment	Yes	Yes [17]	Yes	Yes
Regulatory Pause	10 years [18]	--	10 years [19]	12 years **Error! Bookmark not defined.**[20]

[12] After administrative costs.
[13] Taxability of dividend makes PAYGO offset unnecessary to ensure revenue neutrality.
[14] Phased out for high-income households ($80-$100K for single filers, $130-$150K for joint filers).
[15] Low Income Heating Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP).
[16] Split among 19 categories.
[17] Also includes payments from border adjustment surplus for soil sequestration and direct air capture.
[18] Limited to GHG rules for stationary combustion sources.
[19] Limited to GHG rules for stationary combustion sources.
[20] May be rescinded if targets are exceeded after 5 years and again after 8 years.