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Congress at a Climate Crossroads: Legislative Pathways for Decarbonization in the United States

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**Congress at a Climate Crossroads:
Legislative Pathways for Decarbonization in the United States**

A thesis presented by

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to

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Chapter 1: Introduction

The American Climate Policy Pendulum

On November 3rd, 2020 the world watched the results of the U.S. 2020 election trickle in with bated breath. Through the duration of the campaign, pundits, policy experts, politicians, and activists repeatedly commented on the unprecedented stakes of the election.¹ In the year leading up to the election, the U.S. underwent the devastating impacts of the COVID-19 pandemic, a prolonged economic crisis, a national reckoning on racial injustice and record-breaking protests, the first impeachment trial of President Donald Trump, catastrophic wildfires, and the most active hurricane season in recorded history.² Many constituencies and interest groups certainly had much to win or lose during this election cycle, but the implications of the Presidential and U.S. Senate elections were particularly pronounced for those hoping that the United States would rejoin its international partners in the battle to solve the climate crisis. The very next day after the election, the U.S. was set to become the first country to formally withdraw from the 2015 Paris Climate Agreement, which made the stakes of the election for the future of American climate policy even more starkly apparent.³

Despite the tense buildup to election day, the American people, and the world, had to wait for what seemed like an eternity for the results to be finalized. It took four days for the

¹ Michael Hirsh, “The Most Important Election. Ever.,” *Foreign Policy*, September 25, 2020, <https://foreignpolicy.com/2020/09/25/2020-election-donald-trump-joe-biden/>.

² Shom Mazumder, “What Protests Can (And Can’t) Do,” *FiveThirtyEight* (blog), June 8, 2020, <https://fivethirtyeight.com/features/what-protests-can-do/>; Nicholas Fandos, “Trump Acquitted of Two Impeachment Charges in Near Party-Line Vote,” *The New York Times*, February 5, 2020, sec. U.S., <https://www.nytimes.com/2020/02/05/us/politics/trump-acquitted-impeachment.html>; Rhett Butler, “Top 10 Environmental News Stories of 2020,” *Mongabay Environmental News*, December 22, 2020, <https://news.mongabay.com/2020/12/top-10-environmental-news-stories-of-2020/>; Lisa Mascaro and Mary Clare Jalonick, “President Donald Trump Impeached by US House, 3rd in History,” *AP NEWS*, December 18, 2019, <https://apnews.com/article/d78192d45b176f73ad435ae9fb926ed3>.

³ Matt McGrath, “Climate Change: US Formally Withdraws from Paris Agreement,” *BBC News*, November 4, 2020, sec. Science & Environment, <https://www.bbc.com/news/science-environment-54797743>.

Presidential election to be called for Joe Biden by major news organizations, and several more weeks, following two runoff elections in Georgia, to determine that Democrats would control the White House, the Senate, and the U.S. House of Representatives.⁴ During the campaign, President Biden had made communicating to voters about his ambitious climate agenda a top priority.⁵ His proposed climate plan was extensive, however, the slim majorities held by Democrats in the House and Senate would make enacting comprehensive climate legislation an arduous task. President Biden began his presidency by signing a number of executive orders and rejoining the Paris Climate Accords to reaffirm an American commitment to reduce emissions and swiftly respond to the climate crisis.⁶ Still, how exactly the U.S. will proceed with further climate policy beyond these measures remains unknown.

Where We Stand: Climate Change in 2021

Federal action or inaction in response to climate change over the next several years will have far-reaching implications, both for the U.S. and for the global effort to mitigate the climate crisis. The emissions reductions commitments made by countries as part of the 2015 Paris Agreement, also known as nationally determined contributions (NDCs), were a significant step toward reducing global greenhouse gas emissions and the risks associated with climate change. However, a recent study published by researchers at the University of Washington found that,

⁴ Katie Glueck, “Joe Biden Is Elected the 46th President of the United States.,” *The New York Times*, November 7, 2020, sec. U.S., <https://www.nytimes.com/2020/11/07/us/politics/joe-biden-is-elected-the-46th-president-of-the-united-states.html>; John Wagner et al., “Democrats Win Control of U.S. Senate as Ossoff Defeats Perdue,” *Washington Post*, January 6, 2021, <https://www.washingtonpost.com/politics/2021/01/06/georgia-senate-election-results-live-updates/>.

⁵ Joe Biden, “Plan for Climate Change and Environmental Justice,” 2020, <https://joebiden.com/climate-plan/>.

⁶ “FACT SHEET: President Biden Takes Executive Actions to Tackle the Climate Crisis at Home and Abroad, Create Jobs, and Restore Scientific Integrity Across Federal Government,” The White House, January 27, 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/27/fact-sheet-president-biden-takes-executive-actions-to-tackle-the-climate-crisis-at-home-and-abroad-create-jobs-and-restore-scientific-integrity-across-federal-government/>; Antony Blinken, “The United States Officially Rejoins the Paris Agreement,” U.S. Department of State, February 19, 2021, <https://www.state.gov/the-united-states-officially-rejoins-the-paris-agreement/>.

given current trends, most countries will neither fulfill their NDC commitments nor will global warming be limited to the 2°C target laid out in the Paris Agreement.⁷ In order to meet the 2°C target, countries would on average have to increase their rates of emissions reductions by 80%. In the U.S., this would mean committing to a 36% reduction in greenhouse gas emissions by 2025 compared to 2005 levels. The previous commitment made by the U.S. in 2015 was to reduce emissions by 26%-28% by 2025. To meet these international climate commitments, the U.S. government will need to take swift action including comprehensive policies to decarbonize the American economy and energy system.

Without decisive action to reduce greenhouse gas emissions over the long-term, climate change is predicted to cause significant harm to the United States.⁸ Already, severe weather events have begun to occur with increased frequency and severity. 2020 saw a record 22 weather or climate related disasters with damages surpassing \$1 billion per event in the United States alone.⁹ Over the last five years, the U.S. has spent an average of \$121.4 billion per year on these disasters which resulted in a total of 3,969 deaths.¹⁰ These figures represent just one of the numerous ways in which climate change has already become a defining challenge of our time. The future costs of inaction for climate change are inconceivably high. There is a clear imperative for comprehensive policies to be enacted in the U.S. and globally to draw down greenhouse gas emissions. In the U.S., this will likely require federal legislation to transform our energy system and encourage innovation of low-emissions technologies.

⁷ Peiran R. Liu and Adrian E. Raftery, “Country-Based Rate of Emissions Reductions Should Increase by 80% beyond Nationally Determined Contributions to Meet the 2 °C Target,” *Communications Earth & Environment* 2, no. 1 (February 9, 2021): 1–10, <https://doi.org/10.1038/s43247-021-00097-8>.

⁸ David R. Reidmiller et al., “Impacts, Risks, and Adaptation in the United States: The Fourth National Climate Assessment, Volume II” (U.S. Global Change Research Program, 2018), 26, <https://doi.org/10.7930/NCA4.2018>.

⁹ Adam B. Smith, “U.S. Billion-Dollar Weather and Climate Disasters, 1980 - Present (NCEI Accession 0209268)” (NOAA National Centers for Environmental Information, 2020), <https://doi.org/10.25921/STKW-7W73>.

¹⁰ Smith.

A Missed Legislative Opportunity: Waxman-Markey

The phenomenon of climate change is not a recent discovery¹¹, and 2021 certainly isn't the first time that the United States has had the opportunity to enact an aggressive emissions reduction policy. In June of 2009, the American Clean Energy Security Act of 2009 (H.R. 2454), also known as 'Waxman-Markey', narrowly passed the House of Representatives.¹² The bill would have set a price on carbon through a cap-and-trade system which aimed to reduce emissions from covered sources 83% by 2050, compared to 2005 emissions. It also would have established a "combined energy efficiency and renewable electricity standard" that would have required electricity suppliers to meet 20% of their demand with renewable electricity by 2020.¹³ There were high hopes that the bill would also pass the U.S. Senate and be signed into law by President Barack Obama, but Waxman-Markey ultimately failed in 2010.¹⁴ A number of articles, reports, and studies¹⁵ have examined the case of Waxman-Markey and why comprehensive climate legislation wasn't able to pass in Congress despite Democratic control of the White

¹¹ Svante Arrhenius, *Worlds in the Making; the Evolution of the Universe*, (New York, London: Harper, 1908), <http://nrs.harvard.edu/urn-3:HUL.FIG:001832832>; Nathaniel Rich, "Losing Earth: The Decade We Almost Stopped Climate Change," *The New York Times*, August 1, 2018, sec. Magazine, <https://www.nytimes.com/interactive/2018/08/01/magazine/climate-change-losing-earth.html>.

¹² Henry A. Waxman, "Actions - H.R.2454 - 111th Congress (2009-2010): American Clean Energy and Security Act of 2009," July 7, 2009, 2009/2010, <https://www.congress.gov/bill/111th-congress/house-bill/2454/actions>.

¹³ Henry A. Waxman, "H.R.2454 - 111th Congress (2009-2010): American Clean Energy and Security Act of 2009" (2009), <https://www.congress.gov/bill/111th-congress/house-bill/2454>.

¹⁴ Nate Loewentheil, "Of Stasis and Movements: Climate Legislation in the 111th Congress," *SSRN Electronic Journal*, 2013, 15, <https://doi.org/10.2139/ssrn.2202979>.

¹⁵ Theda Skocpol, "What It Will Take to Counter Extremism and Engage Americans in the Fight against Global Warming," January 2013, https://scholars.org/sites/scholars/files/skocpol_captrade_report_january_2013_0.pdf; Petra Bartosiewicz and Marissa Miley, "The Too Polite Revolution Why the Recent Campaign to Pass Comprehensive Climate Legislation in the United States Failed" (Columbia School of Journalism and the Scholars Strategy Network, January 2013), https://scholars.org/sites/scholars/files/rff_final_report_bartosiewicz_miley.pdf; Michael Grunwald, "A New Report Says Change Happens From the Outside. But in the Obama Era, It's Happened on the Inside. | TIME.Com," *Time Magazine*, January 18, 2013, <https://swampland.time.com/2013/01/18/a-new-report-says-change-happens-from-the-outside-but-in-the-obama-era-its-happened-on-the-inside/>; Kyle C. Meng and Ashwin Rode, "The Social Cost of Lobbying over Climate Policy," *Nature Climate Change* 9, no. 6 (June 2019): 472–76, <https://doi.org/10.1038/s41558-019-0489-6>; John M. Broder, "'Cap and Trade' Loses Its Standing as Energy Policy of Choice," *The New York Times*, March 26, 2010, sec. Science, <https://www.nytimes.com/2010/03/26/science/earth/26climate.html>.

House and both Houses of Congress. Some researchers have suggested that lobbying efforts to kill the bill by firms expecting a negative impact on their stock prices resulting from passage of the policy were a key factor.¹⁶ Alternatively, others have suggested that Waxman-Markey failed because of the absence of an organized grass-roots political movement which understood and supported the bill.¹⁷ In any event, the failure of Waxman-Markey continues to shape the political dynamics which define the debate on future climate policy. The landmark proposal still represents the closest the U.S. has come to passing comprehensive climate legislation through Congress to reduce greenhouse gas emissions throughout the entire economy.

A Climate Policy Pendulum

The historical absence of a legislative framework directing U.S. climate policy has meant that most climate action taken by the federal government has occurred through the executive branch. For example, the Obama Administration joined the Paris Climate Accords and announced the Clean Power Plan (CPP) to pursue emissions reductions in the power sector using statutory authority granted to the Environmental Protection Agency (EPA) under the Clean Air Act (CAA).¹⁸ However, policies to decarbonize the U.S. energy system that are enacted through executive orders can often be short-lived. Control of the White House changed parties with the election of Donald Trump election in 2016, and the country's policy priorities shifted toward deregulation and rollbacks of environmental standards promulgated by the Obama

¹⁶ “Lessons Learned From the Last Major U.S. Climate Bill: Lobbying Takes Its Toll,” Energy Policy Institute at the University of Chicago, *EPIC News* (blog), May 28, 2019, <https://epic.uchicago.edu/news/lessons-learned-from-the-last-major-u-s-climate-bill-lobbying-takes-its-toll/>; Anthony Adragna, “POLITICO Pro Q&A: Sen. Ed Markey,” Politico Pro, February 9, 2021, <https://subscriber-politicopro.com.ezp-prod1.hul.harvard.edu/article/2021/02/politico-pro-q-a-sen-ed-markey-2033402>.

¹⁷ James Handley, “Cap-and-Trade Post-Mortems Overlook Fatal Flaw of ‘Hide the Price,’” *Carbon Tax Center* (blog), January 29, 2013, <https://www.carbontax.org/blog/2013/01/29/cap-and-trade-post-mortems-overlook-fatal-flaw-of-hide-the-price/>.

¹⁸ Blair Beasley, “Clean Power Plan: Timeline of Key Events,” Bipartisan Policy Center, 2020, <https://bipartisanpolicy.org/clean-power-plan-timeline-of-key-events/>.

Administration.¹⁹ Under the Trump Administration, climate policy was deprioritized, and the existence of climate change was often dismissed altogether.²⁰

While the 2016 sea change in environmental policy left many environmental advocates feeling disheartened, this dramatic reversal of U.S. climate policy in the executive branch was nothing new. Over the past three decades, transitions between Presidential Administrations have reflected something of a climate policy pendulum, where Democratic Presidents including Bill Clinton and Barack Obama pursued decarbonization plans and subsequent Republican Administrations under Presidents George W. Bush and Donald Trump sought to roll-back their efforts and delegitimize climate science. Oscillating priorities for American climate action can be attributed in large part to the absence of a stable legislative framework which has been agreed upon and passed by members of Congress which can direct the federal government's priorities over longer periods of time. While Democratic Administrations have in some cases been able to use the authority of the executive branch to implement climate policies, these measures can be undone with relative ease by a President hostile to climate action.

Following the election of President Joe Biden, whose climate plans are likely the most ambitious of any previous President, the U.S. seems poised for another oscillation of the climate policy pendulum toward climate action. However, as cumulative greenhouse gas emissions in the atmosphere and global temperatures continue to rise, prudent policy would aim for more permanent solutions. The problem of climate change will play out over long time horizons, and so will its solutions. Thus far, a volatile regulatory environment relating to climate mitigation

¹⁹ Nadja Popovich, Livia Albeck-Ripka, and Kendra Pierre-Louis, "The Trump Administration Rolled Back More Than 100 Environmental Rules. Here's the Full List.," *The New York Times*, October 16, 2020, sec. Climate, <https://www.nytimes.com/interactive/2020/climate/trump-environment-rollbacks-list.html>.

²⁰ Alejandro de la Garza, "Trump Mocks Climate Change After DoD Releases Climate Report," *Time Magazine*, January 20, 2019, <https://time.com/5508259/trump-climate-change-defense-department/>.

policy has likely prevented meaningful long-term investments in technological innovation that could reduce greenhouse gas emissions. Further, addressing climate change will take a global effort to reduce emissions. As the largest economy, the U.S. has a special role to play in creating demand for low-emitting technologies and reducing its own emissions.²¹ However, each time the American climate policy pendulum swings from action to inaction, U.S. credibility abroad deteriorates, and mustering leadership to coordinate global emissions reductions becomes more challenging.

In 2021, the Biden Administration and newly elected Congress have an opportunity to enact an aggressive and durable climate policy. President Biden’s campaign pledge of achieving “a 100% clean energy economy” and “net-zero emissions no later than 2050” in the U.S. will likely require legislation instead of executive orders which could be reversed by a future President.²² Ambitious targets such as these will require long-term investments by the private sector, and stable market signals which would be disrupted by a continuation of the American climate policy pendulum. Coinciding with the swearing in of a new presidential Administration and new Congress, several think-tanks, politicians, and advocacy groups have published many new proposals for federal climate action. These proposals form the backdrop to the current climate policy debate in Washington, D.C., including a variety of radically different approaches to solving the climate crisis, and ranging from economy-wide carbon pricing, to clean electricity standards, and to green infrastructure spending accompanied by federal jobs guarantees.

Thesis Roadmap

²¹ Prableen Bajpai, “The 5 Largest Economies In The World And Their Growth In 2020,” NASDAQ, January 22, 2020, <https://www.nasdaq.com/articles/the-5-largest-economies-in-the-world-and-their-growth-in-2020-2020-01-22>.

²² Biden, “Plan for Climate Change and Environmental Justice.”

This thesis is an examination of selected contemporary legislative proposals to address climate change in the United States from technological, economic, and political perspectives. The first chapter will discuss economy-wide carbon pricing. It will include analysis of a seminal proposal put forward by the Climate Leadership Council²³, designed around a carbon fee and dividend. This chapter will serve as a case study for the current context regarding a potential economy-wide market-based climate policy more broadly, discussing the advantages and disadvantages of these policies from technological, economic, and political perspectives.

The second chapter will center on a set of sector-based policy approaches which have been proposed by moderate Democrats in Congress, the Biden Administration, and by proponents of the Green New Deal to decarbonize the power sector.²⁴ This chapter will primarily focus on recently proposed Clean Electricity Standards (CES) and Tradable Performance Standards (TPS), examining if these policies are more politically palatable than economy-wide policy approaches and if they can provide pathways to sustainable and significant decarbonization of the entire economy.

The final chapter will synthesize findings from the preceding chapters and present an argument for some of the key considerations policymakers hoping to enact sensible federal climate policies should have in mind during the current Congress and Administration. This thesis will argue that federal lawmakers should prioritize passing legislation to mitigate U.S. greenhouse gas emissions, such as an economy-wide carbon price, CES or TPS for the power sector, or some other policy despite their imperfections. A short-term policy achievement to reduce emissions which can outlast executive actions made by the Biden Administration could

²³ “Climate Leadership Council Mission,” Climate Leadership Council, 2020, <https://clcouncil.org/mission/>.

²⁴ Alexandria Ocasio-Cortez, “H.Res.109 - 116th Congress (2019-2020): Recognizing the Duty of the Federal Government to Create a Green New Deal.” (2019), <https://www.congress.gov/bill/116th-congress/house-resolution/109/text>.

build momentum to pass more comprehensive climate mitigation legislation in the future which will be necessary to decarbonize the economy.

Methodology and Scope

Thesis Scope and Key Policy Proposals Being Analyzed

This thesis will focus on selected climate mitigation policy proposals which are representative of policies with the potential to have the most far-reaching decarbonization impacts throughout the economy. This includes economy-wide carbon pricing, which most economists agree is the most efficient policy for achieving the types of ambitious long-term emissions goals stated by President Biden. The alternative set of policies considered in this thesis are focused on the power sector. The power sector represents a significant segment of U.S. greenhouse gas emissions and other high emitting sectors of the economy will likely depend on the power sector decarbonize. For example, decarbonization of the transportation sector, which is the highest emitting economic sector in the U.S., is heavily dependent on decarbonization of the power sector. The U.S. is beginning to shift to zero emissions electric vehicles as alternatives to conventional vehicles running on fossil fuels. However, electric vehicles must be charged and will only contribute to significant emissions reductions if they run on electricity generated with low or zero greenhouse gas emissions. A clean power sector could help other industries decarbonize as well including the commercial and residential building sector as well as heavy industry. Thus, sector-based policies such as clean electricity standards have the potential to have an outsized impact in other areas of the economy on a comparable scale to economy-wide carbon pricing.

This thesis will not include a comprehensive examination of every policy proposal for climate mitigation. It will focus on decarbonization legislation which can drive forward

necessary progress toward decarbonization over the next twenty years. This means that the many promising proposals to support research and development of new technologies or programs to mitigate the climate crisis being carried out at the federal and state levels fall outside the scope of this thesis, as their potential near-term impacts are not on the same scale as carbon pricing or clean electricity standards.²⁵ However, it should be acknowledged that these policies still have an important role to play in the long-term development and eventual deployment of new technologies which will help the U.S. achieve deep decarbonization, but that they are distinct from the types of legislation that can achieve major reductions in greenhouse gas emissions in the present and near future. This thesis also will exclude examine regulatory actions from the executive branch which could be used to further mitigate U.S. emissions. These policies, as discussed already, are often impermanent and fall under a different procedural process for implementation which does not require legislation to be enacted.

Methodology

My approach to analyzing contemporary federal proposals for addressing climate change will draw on the policy evaluation criteria laid out in *Basic Methods of Policy Analysis and Planning* by Patton et al., including an analysis of each proposal's technical feasibility, economic and financial possibility, and political viability.²⁶ This is in accordance with the policy analysis framework proposed in "Bardach's typology" which identifies several constraints which are meant to help policymakers and scholars evaluate the effectiveness of a given policy. I have

²⁵ John Larsen et al., "Expanding the Reach of a Carbon Tax: Emissions Impacts of Pricing Combined with Additional Climate Actions" (Columbia SIPA Center on Global Energy Policy, October 20, 2020), <https://www.energypolicy.columbia.edu/research/report/expanding-reach-carbon-tax-emissions-impacts-pricing-combined-additional-climate-actions>.

²⁶ David Sawicki, Carl Patton, and Jennifer Clark, *Basic Methods of Policy Analysis and Planning -- Pearson EText* (Taylor and Francis, 2015), 195–97, <https://doi.org/10.4324/9781315664736>.

defined relevant questions, considering the technological, economic, and political dimensions of each plan to guide my analyses, which are presented at the beginning of each chapter.

Approach to Technological Analysis

Contemporary climate policy proposals are often accompanied by estimates of their respective impacts on greenhouse gas emissions, and it is important to evaluate and compare these estimates across the major competing plans so that policymakers understand the tradeoffs involved in pursuing a given set of policy choices to address climate change. In my analysis of the technical feasibility of each policy, I include references to various emissions models, secondary analyses, and projections of technology adoption which result may result from a given policy proposal. This thesis will cover the degree to which contemporary climate policy proposals could reduce greenhouse gas emissions in alignment with their stated targets, and whether they will drive the adoption of low-carbon technologies at scale across domestic and international contexts. Furthermore, determining each policy's direct and indirect impacts, short-term and long-term impacts, and adequacy (how far a policy goes toward solving climate change) will be useful as a basic framework for assessing technical feasibility.²⁷

Approach to Economic Analysis

To analyze the economic impact of each of these policies, I will evaluate the costs and benefits associated with each policy. Some costs and benefits will be clearly stated in the language of each of the proposals and accompanying documents from their authors. However, there are also undefined impacts on the economy for every policy. To account for these undefined economic impacts, I will include a discussion of secondary sources that evaluate economic costs and benefits for pieces of each proposal not explicitly mentioned. Further, I will

²⁷ David Sawicki, Carl Patton, and Jennifer Clark, 196.

compare estimates of the economic impact of these policies published by their proponents with independent economic analysis. This thesis will address the impacts of these policies on economic growth, unemployment, and distributional economic impacts.

Approach to Political Analysis

While it is important to understand the emissions and technological impacts of a given climate policy proposal and its impact on the economy, it is just as important to understand the feasibility of its implementation from a political perspective. After all, a climate policy without the requisite political support to be passed into law will never be able to achieve its emissions targets or transform the economy. To aid my political analysis of these policies, I will examine public statements of key legislators, public opinion data, key stakeholders in support or opposition to the advancement of these policies, and lessons learned from previous political breakdowns of climate policy proposals.

Chapter 2: Contemporary Economy-Wide Carbon Pricing Proposals in the United States

Chapter 2 Introduction and Overview

Since early in the discussion about optimal responses to climate change, climate policy experts and economists have argued that a carbon price represents the best and most efficient option to curb emissions and transition the United States toward a low carbon economy.²⁸

Emissions of greenhouse gases such as CO₂ contribute to global climate change which imposes significant costs on governments, firms, and individuals.²⁹ Market based carbon pricing policies aim to correct the historic tendency of unregulated markets to reward emissions intensive activities. By imposing a cost on greenhouse gas emissions resulting from transactions throughout the economy, a carbon price would incentivize broad emissions reductions.

Traditionally, carbon prices can take the form of a tax on emissions, which cause emissions-intensive activities to be more expensive, or the allocation of tradable emissions allowances, where a government sets a quantity of emissions allowances and firms can buy, sell, or trade them with each other.³⁰ One often cited argument made on behalf of market-based policies is that they allow emitting firms more flexibility to reduce their emissions in a number of ways compared to

²⁸ Robert N Stavins, “The Future of U.S. Carbon-Pricing Policy,” Working Paper (Cambridge, MA: National Bureau of Economic Research, 2019), https://www.nber.org/system/files/working_papers/w25912/w25912.pdf; Paul Krugman, “Earth in the Balance Sheet: Economists Go for the Green.,” *The Dismal Science* (blog), April 17, 1997, <http://web.mit.edu/krugman/www/green.html>; Peter Passell, “Yawn. A Global-Warming Alert. But This One Has Solutions.,” *The New York Times*, February 13, 1997, sec. Business, <https://www.nytimes.com/1997/02/13/business/yawn-a-global-warming-alert-but-this-one-has-solutions.html>; Robert W. Hahn and Robert N. Stavins, “Economic Incentives for Environmental Protection: Integrating Theory and Practice,” *The American Economic Review* 82, no. 2 (1992): 1.

²⁹ Seth Moulton et al., “The Costs of Climate Change: Risks to the U.S. Economy and the Federal Budget,” § Committee on the Budget (2019), 2, <https://www.govinfo.gov/content/pkg/CHRG-116hhrg37609/pdf/CHRG-116hhrg37609.pdf>.

³⁰ Hahn and Stavins, “Economic Incentives for Environmental Protection,” 1.

so-called command and control style environmental regulations which often mandate a single method for compliance with a policy.³¹

Despite widespread agreement among economists about the usefulness of market-based policies to mitigate the climate crisis, it has been politically difficult to implement such a policy in the U.S. However, market-based approaches to environmental problems have been used by policymakers in the past to address other problems. For example, the administration of President George H.W. Bush successfully implemented an emissions allowance trading scheme to address the problem of acid rain in 1990, and a market based B.T.U. tax on energy intensive fuels was proposed by President Bill Clinton in 1993, though not enacted into law.³²

In the early 2000s, some Republican leaders like Senator John McCain favored a market based approach to addressing climate change.³³ To many conservatives, market based policies were viewed as favorable to other forms of government regulation because they aligned with “the conservative/libertarian philosophy that markets are the most efficient method of allocating resources, that they effectively encourage the dynamic development of new technologies and ways of acting to solve problems”.³⁴ Bipartisan support for market based solutions for climate change in the U.S. changed when the views of average Americans on climate policy became significantly more polarized by political party.³⁵ By the mid to late 2000s, many elected officials

³¹ “Market-Based Strategies,” Center for Climate and Energy Solutions, June 13, 2020, <https://www.c2es.org/content/market-based-strategies/>.

³² OAR US EPA, “Acid Rain Program,” US EPA, August 21, 2014, <https://www.epa.gov/acidrain/acid-rain-program>; David E. Rosenbaum, “Clinton Backs Off Plan for New Tax on Heat in Fuels,” *The New York Times*, June 9, 1993, sec. U.S., <https://www.nytimes.com/1993/06/09/us/clinton-backs-off-plan-for-new-tax-on-heat-in-fuels.html>.

³³ Marianne Lavelle, “John McCain’s Climate Change Legacy,” *Inside Climate News*, August 26, 2018, <https://insideclimatenews.org/news/26082018/john-mccain-climate-change-leadership-senate-cap-trade-bipartisan-lieberman-republican-campaign/>.

³⁴ Spencer Banzhaf, “The Conservative Roots of Carbon Pricing,” *National Affairs*, 2020, <https://www.nationalaffairs.com/publications/detail/the-conservative-roots-of-carbon-pricing>.

³⁵ Patrick J. Egan and Megan Mullin, “Climate Change: US Public Opinion,” *Annual Review of Political Science* 20, no. 1 (May 11, 2017): 209–27, <https://doi.org/10.1146/annurev-polisci-051215-022857>.

in the Republican party shifted to opposing any type of environmental regulation and denying the existence of climate change altogether. Although debates over climate policy in the United States remain politically polarized today, it is still important to examine the prospects and promise of carbon pricing policies, as they continue to be widely regarded as one of the most effective options governments can pursue to mitigate further climate change.³⁶

Carbon Pricing is already being implemented in many countries around the world and in twelve states across the U.S.³⁷ State level programs include the Regional Greenhouse Gas Initiative (RGGI) across eleven states in eastern U.S. and California's cap and trade program in the West.³⁸ China, currently the world's largest contributor to annual greenhouse gas emissions³⁹, has committed itself to a national carbon trading market as part of its plan to become carbon neutral by 2060.⁴⁰

While most Republicans currently serving in Congress have not offered their voices in support of carbon pricing, some outliers exist. A select group of Republican members of Congress from both the House of Representatives and the United States Senate have voiced their interest in revenue-neutral carbon fees as a potential solution to the climate problem.⁴¹ Over the

³⁶ Gilbert Metcalf and James Stock, "Capitol Invasion Opened the Door for Sensible Climate Policy," *The Hill*, January 22, 2021, <https://thehill.com/opinion/energy-environment/535375-capitol-invasion-opened-the-door-for-sensible-climate-policy>.

³⁷ "Market-Based Strategies."

³⁸ "RGGI, Inc. | RGGI, Inc.," 2021, <https://www.rggi.org/rggi-inc/contact>; "Cap-and-Trade Program About," California Air Resources Board, 2021, <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about>.

³⁹ "Each Country's Share of CO₂ Emissions" (Union of Concerned Scientists, August 12, 2020), <https://www.ucsusa.org/resources/each-countrys-share-co2-emissions>; Johannes Friedrich, Mengpin Ge, and Andres Pickens, "This Interactive Chart Shows Changes in the World's Top 10 Emitters," *World Resources Institute* (blog), December 10, 2020, <https://www.wri.org/blog/2020/12/interactive-chart-top-emitters>.

⁴⁰ Jonathan Shieber, "China Launched Its National Carbon Trading Market Yesterday: If Done Right, It Could Be a Big Deal in the Fight against Climate Change," *TechCrunch* (blog), February 2, 2021, <https://social.techcrunch.com/2021/02/02/china-launched-its-national-carbon-trading-market-yesterday/>; Steven Lee Myers, "China's Pledge to Be Carbon Neutral by 2060: What It Means," *The New York Times*, September 23, 2020, sec. World, <https://www.nytimes.com/2020/09/23/world/asia/china-climate-change.html>.

⁴¹ Josh Siegel, "GOP Group Launches Ad Campaign for Carbon Tax," *Washington Examiner*, March 17, 2021, <https://www.washingtonexaminer.com/policy/energy/gop-group-launches-ad-campaign-carbon-tax-hill-shows-signs-moving-on>; Nick Sobczyk, "Murkowski: Carbon Pricing 'Worth Putting on the Table,'" *E&E News*, October 22, 2020, <https://www.eenews.net/stories/1063716797>.

last five years, a group of former high-ranking Republican officials, along with the help of policy think tanks and nonprofits have pushed for a carbon price in the form of a revenue-neutral carbon fee. This has culminated in the introduction of several bills using similar policy mechanisms during the 116th Congress (January 2019 - January 2021), which have received bipartisan support. Presently, the slim majorities which Democrats hold in the House and Senate likely mean that Republicans will play a key role in determining what types of climate policies are able to be passed into law during the 117th Congress (January 2021 - January 2023). Therefore, it is important for policymakers and climate action advocates focused on passing comprehensive federal climate change legislation in the U.S. to understand constituencies on the political right and whether or not passing a carbon pricing mechanism could be politically feasible.

Chapter 2 Roadmap

This chapter will discuss federal legislative proposals for carbon pricing and will engage in a detailed discussion of the Baker-Shultz plan to implement a federal carbon dividends program which has been pivotal in shaping current discussions of market based policies to address climate change. First, it will discuss how current carbon fee and dividend proposals work and why their proponents argue that they are effective. Second, this chapter will cover the degree to which market based incentive schemes could reduce greenhouse gas emissions in alignment with their stated targets, and whether they will drive the adoption of low-carbon technologies at scale across domestic and international contexts. Third, this chapter will critically engage with estimates regarding the types of impacts a carbon fee could have on unemployment and economic growth, as well as its distributional economic impacts. Next, this chapter will briefly discuss other available policy options for economy-wide carbon pricing that have been proposed by members of Congress, think tanks, and in scholarly literature. Finally, the chapter will

examine political support for the proposal and the feasibility of passing a carbon fee into law at the federal level.

Part I: The Climate Leadership Council Carbon Dividends Plan

Over the last four and a half years, a coalition of economists, moderate republicans, and business interest groups has emerged in support of a carbon fee and dividend scheme that has generated excitement across the political spectrum for a potential policy breakthrough.⁴² In 2017, the Climate Leadership Council (CLC) announced its proposal for a revenue neutral “carbon dividends program”.⁴³ The plan came to be known as the “Baker-Shultz Plan”⁴⁴ named for the two primary authors of the proposal: George Shultz, former Secretary of State under President Ronald Reagan, and James Baker, former Secretary of State under President George H.W. Bush. Sadly, Secretary Shultz passed away in February.⁴⁵ However, the CLC continues to actively advocate for the plan he helped to create.

This chapter will examine the Baker-Shultz plan (also referred to as “the CLC plan”) as a case study representative of recently proposed market-based policies focused on mitigating climate change. While the Baker-Shultz plan has not been finalized as a bill in Congress, it is still possible to analyze the plan’s proposed price on carbon, carbon price accelerator, changes in greenhouse gas regulations, border adjustment fee, and revenue rebate scheme as ongoing developments in the proposal’s formation continue to be made. The Baker-Shultz plan represents a policy framework drawn upon by other proposals introduced in the 116th Congress by

⁴² “Editorial Board Endorsements,” Climate Leadership Council, 2020, <https://clcouncil.org/endorsements/>.

⁴³ “Corporate Founding Members,” Wall Street Journal, June 20, 2017, https://clcouncil.org/media/2017/06/Climate_Leadership_Council_WSJ_Ad.pdf; James Baker and George Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap” (Climate Leadership Council, October 2020), iii–v, <https://clcouncil.org/Bipartisan-Climate-Roadmap.pdf>.

⁴⁴ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” 3.

⁴⁵ Stanford News Service, “George Shultz, Statesman and Stanford Scholar, Dies at 100,” Stanford News, February 7, 2021, <https://news.stanford.edu/2021/02/07/george-shultz-statesman-stanford-scholar-dies-100/>.

legislators from both political parties. Describing the Baker-Shultz plan's economic and technological strengths and weaknesses is illuminating for similar economy wide carbon pricing policies that may be considered in the 117th Congress.

Part II: How Would a Carbon Dividend Work (The Baker-Shultz Example)

The Baker-Shultz plan incorporates four central pillars as a part of its policy design: a gradually rising carbon fee, a carbon dividend, significant regulatory simplification, and a border carbon adjustment.

Carbon Fee

The plan's carbon fee would apply, economy-wide, to all CO₂ emissions, and the initial fee would start at \$40 per ton CO₂ emitted (in 2017 dollars).⁴⁶ Similar to other carbon pricing proposals, the carbon fee would be assessed at upstream points of entry where fossil fuel emissions enter the economy. These entry points include refinery exits, mines, wells, ports, and local gas distribution sites.⁴⁷ The purpose of placing carbon fees on upstream sources of CO₂ emissions is to send a market signal to consumers and producers which disincentivizes carbon-intensive activities by making them more costly compared to alternative activities associate with lower emissions.⁴⁸ Market signals are designed to make alternative low-carbon activities comparatively more profitable over time, while phasing carbon-intensive activities out of the economy by making them more expensive. CLC has estimated that the implementation of a 40\$/ton fee on carbon (2017\$) would result in a 50% reduction of U.S. emissions (at 2005 levels)

⁴⁶ Baker and Shultz, "The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap," 5.

⁴⁷ Baker and Shultz, 5.

⁴⁸ Gilbert E. Metcalf and David Weisbach, "The Design of a Carbon Tax," *The Harvard Environmental Law Review* : HELR 33, no. 2 (2009): 499–556.

by 2035.⁴⁹ Emission targets for 2050 and adjustments to the carbon price would be set in 2035, following a reassessment to evaluate initial progress achieved by the policy.⁵⁰

Carbon Price Accelerator and Emissions Assurance Mechanism (EAM)

To incentivize long term emissions reductions, the Baker-Shultz plan includes an annual carbon price accelerator which increases the carbon price over time. While the final escalation rate has not been finalized, CLC reports have proposed increasing the initial 40\$/ton of CO₂ carbon fee by 5% per year, plus inflation.⁵¹

To ensure the Baker-Shultz plan holds itself to its medium-term target of a 50% emissions reduction by 2035, the plan includes an “Emissions Assurance Mechanism” (EAM), which would be triggered if emissions reductions have not begun fast enough starting five years after the plan’s implementation.⁵² Activation of the EAM would allow the initial annual carbon price escalator to rise faster than the initial escalation rate of 5% per year. The EAM includes a requirement of an automatic increase of the carbon price accelerator to 7.5% per year in the first year after prescribed goals for emissions reductions have been not achieved. Two years later, the annual escalation rate could be increased again to 10% per year above inflation if emissions goals are still not met. If emissions reductions occur after the EAM is implemented, then the original escalation rate of 5% would be reinstated.⁵³

Revenue Neutral Carbon Dividend

By assessing a roughly \$40/ton CO₂ fee on carbon emissions, the Baker-Shultz plan would create significant revenues for the government. A key feature of this policy design,

⁴⁹ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” 5.

⁵⁰ Baker and Shultz, 5.

⁵¹ Baker and Shultz, 5.

⁵² Baker and Shultz, 5.

⁵³ Baker and Shultz, 5.

however, is that it is revenue neutral. Accordingly, after the administrative costs of the program are accounted for, all revenues from the carbon fee are rebated back to taxpayers in the form of a “carbon dividend”.⁵⁴ The dividend program would be administered by The Treasury Department, Social Security Administration, and other relevant agencies. The carbon dividend would be distributed as cash rebates on a quarterly basis, four times each year.⁵⁵ According to CLC estimates, “A family of four will receive approximately \$2,000 in carbon dividend payments in the first year” of the policy.⁵⁶ The size of the carbon dividend would likely grow over time as the carbon fee increases annually and raises larger revenues.

It should be noted that the framing of the CLC proposal as a revenue neutral carbon fee and dividend is an intentional and important choice. Given the CLC proposal is designed such that the government does not keep any of the revenues generated by the carbon fee, it is technically not a tax. The modern American political landscape has historically been hostile to implementing new taxes, and in particular taxes on carbon.⁵⁷ By framing its proposal as a carbon fee and dividend rather than a carbon tax, the CLC likely hopes to reach out to conservatives who may be distrustful of taxes and government regulation.

Regulatory Relief and Impact on Existing Regulations

In addition to the carbon fee and dividend, the CLC proposal includes significant regulatory relief. In current drafts of the Baker-Shultz plan, this would consist of the displacement and preemption of “all current and future federal stationary source carbon regulations.”⁵⁸ While this would not change the “endangerment finding” which gives the

⁵⁴ Baker and Shultz, 6.

⁵⁵ Baker and Shultz, 6.

⁵⁶ Baker and Shultz, 2.

⁵⁷ Ryan Lizza, “As the World Burns | The New Yorker,” *The New Yorker*, October 3, 2010, <https://www.newyorker.com/magazine/2010/10/11/as-the-world-burns>.

⁵⁸ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” 2.

Environmental Protection Agency (EPA) authority to regulate greenhouse gas emissions, it would displace the EPA's obligation to regulate certain stationary sources of CO₂ already covered by the Baker-Shultz plan's carbon fee.⁵⁹ The CLC plan would suspend and preempt all current and future stationary source CO₂ emissions regulations, future federal low-carbon fuel standards, and mobile source emissions standards for farm equipment and non-road vehicles.⁶⁰ Regulatory simplification would not apply to any existing regulations related to non-CO₂ emissions or the existing greenhouse gas reporting program administered by the EPA. Current regulations which are demonstrated to be more cost-effective than the carbon fee proposed by CLC would also either remain in place or be amended, and not superseded by the CLC proposal.⁶¹ Finally, if the CLC plan is repealed or weakened after being passed into law, through a lowering of the fee or adjustment of the EAM, the regulatory obligations which existed prior to its passage would be reinstated.⁶²

Border Carbon Adjustment

The final pillar of the CLC proposal is a border carbon adjustment fee. The border carbon adjustment is designed to prevent emissions leakages to other markets which have not yet implemented a carbon price. Imports from countries without a carbon price would face fees commensurate with their carbon content and U.S. exports to foreign economies which have not yet implemented carbon pricing would be given rebates to ensure the competitiveness of more energy-efficient American goods abroad.⁶³ This would require the implementation of a "carbon customs union" to evaluate the carbon content of traded goods, administer carbon adjustment

⁵⁹ Baker and Shultz, 7, 9.

⁶⁰ Baker and Shultz, 7.

⁶¹ Baker and Shultz, 7.

⁶² Baker and Shultz, 7.

⁶³ Baker and Shultz, 8.

fees and rebates, ensure compliance with World Trade Organization rules and regulations, and encourage climate action among U.S. trading partners.⁶⁴

Part III: Impact on Climate Crisis Mitigation and Technology Adoption

The CLC proposal presents several short-term and medium-term emissions targets. The following sections will cover various projections published by CLC and compare them with independent estimates to evaluate what the emissions impact of the Baker-Shultz plan might be.

CLC Emissions Projections

The CLC has published a number of reports projecting the Baker-Shultz plan's impact on emissions reductions. In one such report most recently updated in September of 2019, members of the CLC claim that the Baker-Shultz plan could achieve emissions reductions exceeding targets laid out in the U.S. commitment made as part of the 2015 Paris Climate Accords. In 2015, the U.S. committed to reducing greenhouse gas emissions by 26-28% below 2005 levels by 2025.⁶⁵ CLC has estimated that its carbon fee and dividend would lead to a 32% reduction of greenhouse gas emissions by 2025 (compared to 2005 levels), exceeding previous U.S. emissions reductions commitments.⁶⁶ The CLC commissioned a report by a nonpartisan organization called Resources for the Future (RFF)⁶⁷ to analyze the emissions reductions from the Baker-Shultz plan. RFF found that a carbon fee beginning in 2021 at \$43 per ton, escalating

⁶⁴ Baker and Shultz, 8.

⁶⁵ "U.S. Nationally Determined Contribution - UNFCCC," March 25, 2015, <https://www4.unfccc.int/sites/ndestaging/PublishedDocuments/United%20States%20of%20America%20First/U.S.A.%20First%20NDC%20Submission.pdf>.

⁶⁶ David Bailey and Greg Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO2 Reduction By 2035" (Climate Leadership Council, September 2019), 1, <https://clcouncil.org/media/Exceeding-Paris.pdf>.

⁶⁷ "About Us," Resources for the Future, accessed March 22, 2021, <https://www.rff.org/about/>.

at 5% per year above inflation would reduce U.S. emissions, compared to 2005 levels, 39% by 2025 and 51% by 2035.⁶⁸

In addition to RFF's analysis, CLC commissioned a report by a small energy research consultancy called Thunder Said Energy,⁶⁹ to determine the Baker-Shultz plan's potential impact on the U.S. economy, energy system, and emissions. Similarly, to RFF's finding, the Thunder Said Energy report predicted a 57% reduction in U.S. emissions by 2035 under the Baker-Shultz plan (compared to 2005 annual emissions levels), which exceeded RFF's previous analysis by 6%.⁷⁰ According to Thunder Said Energy, projected reductions by 2035 under the Baker-Shultz Plan would be equivalent to a 50% annual emissions reduction when compared to 2019 levels.⁷¹

CLC Technological Additionality Projections:

While it is often helpful for policymakers to understand projections for overall emissions reductions, it is also vitally important to be able to predict the additionality of a given climate policy. In other words, it is important to understand whether the policy would achieve outcomes beyond what would already be expected given current economic conditions and technological trends. While the commissioned Thunder Said Energy report findings did not expressly compare each of its projections for the technological impacts of the Baker-Shultz plan to a baseline, it did provide some helpful insights regarding what technological shifts could be expected from the policy. Some of the key findings of the Thunder Said Energy report include the following:

- Under the Baker-Shultz plan, 2035 energy consumption will decrease by 13% compared to 2019 levels

⁶⁸ Bailey and Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO2 Reduction By 2035," 1.

⁶⁹ "About Us Thunder Said Energy," Thunder Said Energy, <https://thundersaidenergy.com/about-us/>.

⁷⁰ Bailey and Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO2 Reduction By 2035," 1; Rob West, "Thunder Said Energy Climate Leadership Council Analysis" (Thunder Said Energy, July 2020), 1, https://assets.morningconsult.com/wp-uploads/2020/07/29124357/TSE_July2020.pdf.

⁷¹ West, "Thunder Said Energy Climate Leadership Council Analysis."

- All coal generated power will be produced at plants with carbon capture and storage (CCS) and coal demand will fall by 85% by 2035
- Oil demand will fall by 35% by 2035
- Demand for natural gas will peak in 2023 and then decline below 2020 levels by 2035.⁷²

The authors of the report predict that a \$40/ton (\$2017) carbon dividend with an annual 5% carbon price accelerator would boost renewable output roughly three-fold by 2053, to make renewably generated power represent 29% of the grid mix.⁷³ This would be achieved as a result of the increased incentive for deployment of wind and solar power which would see a yearly deployment of 50 TerraWatt hours (TWh) between 2020-2025, and 70 TWh from 2025 through 2030, compared to the average of 40 TWh of renewable power deployed between 2014-2019.⁷⁴

The report further predicts that a carbon tax would encourage emissions reductions through numerous technological improvements made in the industrial sector to increase efficiency. For example, in explaining potential sources of emissions reductions in for industrial manufacturing, the report claims that a carbon price and border adjustment mechanism would incentivize localized supply chains which could result in “65-90% CO2 savings” across the manufacturing and distribution of certain goods.⁷⁵ Further, a price on carbon would create a strong financial incentive for firms to install heat exchangers to capture a larger portion of waste. In fact, once the carbon price reaches \$50/ton, the CLC plan is expected to raise the rate of return for investment in heat exchangers by a factor of nearly four.⁷⁶ Another expected technological impact of the CLC carbon dividend would be that gas flaring in U.S. shale gas production could be eliminated once the carbon price reached \$90/ton, and the elimination of methane emissions was not included in the top line emissions reductions projected in this analysis. This is significant

⁷² West, 15.

⁷³ West, 1.

⁷⁴ West, 2.

⁷⁵ West, 2.

⁷⁶ West, 10.

given that the policy would likely increase reliance on shale as a short-term fuel source, compared to more emissions-intensive fuels such as coal. All told, industrial efficiency gains would grow by 2% according to the report.⁷⁷

Thunder Said Energy has also predicted that the CLC carbon dividends plan would facilitate accelerated emissions reductions in the transportation sector. In particular, carbon prices could create a \$500-\$1,000 yearly financial incentive for consumers to invest in electric light passenger vehicles between 2030-2035.⁷⁸ Gasoline demand would drastically decrease if two-thirds of the U.S. vehicle fleet transitioned to be electric by 2050.⁷⁹ Recent commitments by major automakers to phase out light-duty cars and SUVs running on fossil fuels make this prediction seem more credible.⁸⁰ The side-by-side implementation of more stringent fuel economy standards would likely work in tandem with a carbon price to improve fuel efficiency of internal combustion engines of roughly 1.8%.⁸¹ Meanwhile, heavy-duty vehicles would likely present a bigger challenge to electrify and would require breakthroughs in battery technologies.⁸² However, it is clear that the financial incentive to develop electric heavy-duty vehicles would only be strengthened by a carbon price similar to that proposed by the CLC. Still, it is worth acknowledging that each of these technological improvements would place greater demand on the electric grid, potentially creating a set of further technological challenges which would need to be overcome.

What is Left Out of the CLC Proposal

⁷⁷ West, 2.

⁷⁸ West, 14.

⁷⁹ West, 14.

⁸⁰ Steven Mufson, "General Motors to Eliminate Gasoline and Diesel Light-Duty Cars and SUVs by 2035," *Washington Post*, accessed March 23, 2021, <https://www.washingtonpost.com/climate-environment/2021/01/28/general-motors-electric/>.

⁸¹ West, 14.

⁸² West, 14.

The CLC's projected emissions reductions over time are dependent on core assumptions about how the U.S. economy will respond to a carbon price. CLC analysis anticipates that a carbon price would increase the cost of fossil fuel energy, thereby encouraging increased energy efficiency throughout the economy. Additionally, the goal of a price signal which increases over a period of decades would be to encourage increased investments in renewable energy and low-emitting technologies that could replace high carbon fuels and reduce emissions in the long run. According to the CLC, as carbon prices escalate over time, expected emissions reductions associated with each additional price increase will decrease.⁸³ Current drafts of the CLC plan have suggested a carbon price of 40\$ per ton of CO₂ emissions (2017\$) with a 5% per year price accelerator, however, neither of these provisions have been finalized and are therefore subject to change. Therefore, studying the impacts of different carbon price levels and acceleration rates is necessary for informed discussions of the possible emissions reductions which can be achieved by such policies.

Although it is not the central aim of the CLC proposal, reducing greenhouse gas emissions outside energy related to CO₂ emissions is another crucial step toward mitigating climate change. The emissions estimates cited by CLC reports predict significant emissions reductions from the Baker-Shultz plan. However, these estimates include assumptions that similar policies to a carbon fee would be applied to non-energy CO₂ emissions and greenhouse gases other than CO₂.⁸⁴ These emissions could be related to industrial manufacturing processes, land use, or agriculture, and would not directly be covered by the Baker-Shultz plan.⁸⁵ CLC

⁸³ Bailey and Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO₂ Reduction By 2035," 6.

⁸⁴ Bailey and Bertelsen, 6.

⁸⁵ M.Z. Jacobson, "Controlling Non-Energy Emissions in a 100 Percent Wind-WaterSolar (WWS) and Storage World," January 7, 2020, 1, <https://web.stanford.edu/group/efmh/jacobson/Articles/I/NonEnergySolutions.pdf>.

documents explaining the mechanism of its carbon fee and dividend have not specified a clear mechanism for the enforcement of its carbon fee on non-energy CO₂. Non-energy CO₂ emissions are an area where further specificity must be developed in the Baker-Shultz plan so that more accurate predictions and models for future CO₂ emissions can be developed.

However, the CLC still maintains an assumption that the Baker-Shultz plan would be applied to non-energy CO₂ emissions. RFF and CLC estimates have averaged projected impacts for a scenario in which the CLC proposal applies a fee on non-energy CO₂ emissions and a scenario in which the CLC proposal does not apply to non-energy CO₂ emissions. Based on their chosen models, CLC still claims the Baker-Shultz plan would be able to achieve a 31.3% decrease in U.S. emissions by 2025 compared to 2005 levels without putting a price on non-energy related CO₂ emissions. Their scenario which assumes that the Baker-Shultz plan would apply to non-energy CO₂ emissions yields only a 2% improvement in overall emissions reductions, reducing 2025 emissions compared to 2005 levels by 33.6%. Both estimates still exceed the 26-28% emissions reduction commitment made by the U.S. as part of the Paris Agreement.⁸⁶ This at first seems like a datapoint which supports the CLC proposal as an efficient emissions-reducing policy whether or not it is applied to non-energy CO₂ emissions. However, agricultural and industrial emissions combined made up 33% of all U.S. emissions in 2019 and much of those emissions were non-energy related.⁸⁷ If including the CLC carbon fee on non-energy-related emissions only reduces overall emissions by an added 2% by 2025 when non-energy emissions make up a significant share of CO₂ released into the atmosphere, then perhaps more analysis needs to be conducted as to how it will impact CO₂ emissions outside the energy

⁸⁶ Bailey and Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO₂ Reduction By 2035," 6.

⁸⁷ EPA, "Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2019," February 2021, 2-13, 2-32, <https://www.epa.gov/sites/production/files/2021-02/documents/us-ghg-inventory-2021-main-text.pdf>.

sector. The estimates for the Baker-Shultz plan's potential to drive down U.S. emissions are impressive, yet it is likely that further non-energy emissions reductions have been left out of current formulations of the proposal.

Another potential weakness of the Baker-Shultz plan is that it does not cover non-CO2 emissions. According to CLC statements, it will "eventually" propose measures to cover other greenhouse gases perhaps through taxes or other regulations, but the specifics have not yet been determined. In their estimates of the impact of these supplementary non-CO2 policies however, CLC documents acknowledge that they will likely not be able to be implemented to great effect before 2025.⁸⁸ The CLC has assumed a 10% reduction of non-CO2 greenhouse gas emissions for its 2025 estimates of overall U.S. emissions reductions resulting from its proposal.⁸⁹ It is encouraging that CLC estimates project that a carbon fee and dividend will achieve overall emissions reductions surpassing commitments made as part of the Paris Agreement while at the same time including relatively conservative assumptions about the potential for such a policy to reduce non-CO2 emissions. However, analysis regarding how the policy will affect non-CO2 greenhouse gases if actually implemented presents another aspect of the CLC policy proposal which still needs to be addressed.

Independent Emissions Projections for a Carbon Fee

While the CLC's projected emissions reductions resulting from the Baker-Shultz plan are impressive, examining other independent estimates is essential to come to an objective understanding of the technological impacts and emissions reductions of a carbon tax. A recent article published by the Institute for Energy Research (IER), a non-profit organization which

⁸⁸ Bailey and Bertelsen, "Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO2 Reduction By 2035," 6.

⁸⁹ Bailey and Bertelsen, 7.

carries out research on global energy markets,⁹⁰ points out that many of the emissions pledges made as part of the Baker-Shultz plan may give too much credence to the wrong metrics.⁹¹ CLC documents often refer to the impressive emissions reductions that the policy could achieve in terms of annual emissions compared to 2005 levels. However, it is likely that understanding how future emissions trajectories with a carbon dividend compare to future emissions trajectories without a carbon dividend is a more helpful metric. While some of the commissioned reports do reference modeling of these two possible scenarios, the Thunder Said Energy report often fails to do so, which makes its topline findings less useful to policymakers. A further observation made in the IER commentary is that the emissions reductions projected by CLC and its partners are rarely translated to differences in temperature or climate risk. This is a problem given that politically successful environmental policies generally have clear benefits and opaque costs.⁹² While the dividends aspect of the CLC proposal is a clear benefit of the policy for the average citizen, it could be argued that for a policy intended to help solve the climate crisis a primary focus should be placed instead on having a demonstrated positive impact on efforts to reduce emissions.

Analysis by the Rhodium Group,⁹³ a widely respected research organization, sheds light on the problem of comparing emissions projections for future scenarios with and without a carbon tax. Further, their work exposes the problem of creating estimates of achievable long-term emissions reductions of a carbon tax beyond the early years of the policy. Although the Rhodium Group has analyzed the impacts of carbon taxes instead of carbon fee and dividends,

⁹⁰ “Who We Are,” Institute for Energy Research, n.d., <https://www.instituteforenergyresearch.org/about/>.

⁹¹ Jordan McGillis, “Carbon Tax Update, August 2020,” *Institute for Energy Research* (blog), July 31, 2020, <https://www.instituteforenergyresearch.org/climate-change/carbon-tax-update-august-2020/>.

⁹² Skocpol, “What It Will Take to Counter Extremism and Engage Americans in the Fight against Global Warming.”

⁹³ “Rhodium Group - What We Do,” Rhodium Group, 2018, <https://rhg.com/what-we-do/>.

the policy designs are similar enough such that the predicted emissions impacts across the two can be compared. Using a customized version of the National Energy Modelling System (NEMS), which was created by the Energy Information Agency and is consistently relied upon by Congress to set energy policy, the Rhodium Group analyzed the energy and environmental implications of a federal carbon tax in 2018. They found that to achieve substantial long-term emissions reductions targets past 2030, which require annual emissions be reduced 80% below 2005 levels by 2050, carbon fee rates would likely need to exceed those proposed in the Baker-Shultz plan and/or be paired with complementary policies.⁹⁴ Furthermore, emissions reductions under carbon tax proposals with carbon prices similar to the carbon fee in the CLC proposal were projected to flatten out as a result of a rebound in emissions coming from sectors outside the electric power sector.⁹⁵ This analysis suggests that a policy comparable to the CLC proposal could help the U.S. achieve short-term goals set as part of the Paris Agreement, but that getting to net-zero emissions in the latter half of the century would likely require a higher starting carbon fee and/or escalation rate than those proposed in the CLC plan and other complementary proposals to achieve the necessary “decarbonization of buildings, transportation, and industry”.⁹⁶ CLC documents even admit that securing significant emissions reductions in the transport sector would require a much higher tax rate than the initial \$40/ton CO₂.⁹⁷

⁹⁴ John Larsen et al., “Energy and Environmental Implications of a Carbon Tax in the United States,” Columbia SIPA Center on Global Energy Policy, July 17, 2018, <https://www.energypolicy.columbia.edu/research/report/energy-and-environmental-implications-carbon-tax-united-states>.

⁹⁵ John Larsen et al., “Energy and Environmental Implications of a Carbon Tax in the United States,” July 2018, 31–32, https://www.energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Energy_Environmental_Impacts_Carbon_Tax_FINAL.pdf.

⁹⁶ Larsen et al., 33.

https://www.energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Energy_Environmental_Impacts_Carbon_Tax_FINAL.pdf

⁹⁷ Bailey and Bertelsen, “Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO₂ Reduction By 2035,” 6.

To compare emissions trajectories for scenarios with and without a federal carbon tax, the 2018 Rhodium Group study predicted significant emissions reductions resulting from policies with varying tax rates that outperform a continuation of current policies which exceed or almost achieve the goals set in the Paris Agreement for the early 2030's.⁹⁸ For a simulated \$50/ton carbon tax implemented beginning in 2020 and escalating at 2% annually, emissions were projected to fall to 39-46% of 2005 levels by 2030.⁹⁹ This modelling simulates a policy somewhat similar to the CLC proposal, and predicts that its respective impacts on U.S. emissions would be somewhat similar to what documents produced on behalf of the CLC predict the impact of the Baker-Shultz plan would be. Thus, the claims made by CLC documents that the Baker-Shultz plan would exceed the Paris Agreement commitments are not lacking in supporting research, and similar findings have been produced by independent third parties.

Estimates of the Additionality of Low-Carbon Technologies Resulting from a Carbon Fee

The CLC's bold claims regarding a carbon dividend's ability to serve as a strong market signal and fuel technological innovation have been a source of excitement for many, but it is necessary to examine rigorous analyses which have studied whether a carbon fee can drive adoption of low-carbon technologies in the U.S. and abroad. Scholarly literature in environmental economics often assumes that carbon prices can drive technological innovation.¹⁰⁰ Understanding the potential impacts of the CLC proposal (and proposals like it) on innovation of new technologies and individual actions of consumers and firms is useful for determining the overall likelihood that an economy-wide carbon price can achieve its stated goals.

⁹⁸ Larsen et al., "Energy and Environmental Implications of a Carbon Tax in the United States," July 2018, 17.

⁹⁹ Noah Kaufman and Kate Gordon, "The Energy, Economic, and Emissions Impacts of a Federal US Carbon Tax," July 2018, 8,

https://www.energypolicy.columbia.edu/sites/default/files/pictures/CGEP_SummaryOfCarbonTaxModeling.pdf.

¹⁰⁰ Metcalf and Weisbach, "The Design of a Carbon Tax"; Stavins, "The Future of U.S. Carbon-Pricing Policy."

Contrary to many of the claims made on the CLC website and commonly made assumptions in scholarly literature about carbon pricing, recently published studies have called into question whether a carbon price really causes technological change. A recent review carried out by academic researchers in Germany of already implemented carbon pricing schemes concluded that to date, empirical evidence which suggests that carbon pricing promotes the technological change necessary for full decarbonization is lacking, specifically when looking at changes toward investments in zero-carbon technologies.¹⁰¹ While researchers found that carbon pricing schemes resulted in short-term fuel shifts and behavioral change, they argued that effects on technological change were much more modest, if observable at all.¹⁰² Suggested causes for this include that already implemented policies have used carbon prices which are too low or include too many emissions exemptions, or that other economic factors overshadowed the price signal set by a given policy.¹⁰³ Furthermore, the review found that auxiliary policy instruments¹⁰⁴ supporting development of renewable energy “triggered rapid innovation and deployment of zero-carbon technology” when implemented alongside carbon pricing schemes.¹⁰⁵ It’s important to note that the authors of this review observed that “none of the carbon pricing schemes evaluated here was implemented according to text-book theory” and that to spur innovation a carbon price likely needs to be “long-lasting and predictably rising”.¹⁰⁶ Should the CLC carbon

¹⁰¹ Johan Lilliestam, Anthony Patt, and Germán Bersalli, “The Effect of Carbon Pricing on Technological Change for Full Energy Decarbonization: A Review of Empirical Ex-Post Evidence,” *WIREs Climate Change* 12, no. 1 (2021): e681, <https://doi.org/10.1002/wcc.681>.

¹⁰² Lilliestam, Patt, and Bersalli.

¹⁰³ Lilliestam, Patt, and Bersalli.

¹⁰⁴ Lawrence H. Goulder and Ian W. H. Parry, “Instrument Choice in Environmental Policy,” *Review of Environmental Economics and Policy*, *Review of Environmental Economics and Policy*, 2, no. 2 (2008): 152–74, <https://doi.org/10.1093/reep/ren005>.

¹⁰⁵ Lilliestam, Patt, and Bersalli, “The Effect of Carbon Pricing on Technological Change for Full Energy Decarbonization.”

¹⁰⁶ Lilliestam, Patt, and Bersalli.

fee and dividend or a policy like it be implemented, an emphasis on realizing these principles would be important to encourage future innovation where carbon prices have failed in the past.

Part IV: Economic Impact of Carbon Dividends

In addition to the expected environmental and technological impacts of a carbon pricing proposal such as the Baker-Shultz plan, it is important to consider the expected economic costs and benefits of a carbon dividend, impacts on economic growth, distributional impacts on populations across different geographies and income-levels, and impacts on the competitiveness on American firms in global markets.

CLC Estimates of the Economic Impact of a Carbon Fee and Dividend

The CLC has published documents claiming that the implementation of the Baker-Shultz plan will result in net macroeconomic benefits. In a CLC-commissioned study carried out by NERA Economic Consulting,¹⁰⁷ analysts compared equivalent emission reduction scenarios achieved by the Baker-Shultz approach and carbon pricing alternatives. This analysis estimated that the CLC carbon dividends proposal would result in an extra \$190 billion (about \$580 per person in the U.S.) per year in GDP, on average compared with carbon pricing alternatives.¹⁰⁸ For context, 2019 U.S. GDP was \$21.43 trillion according to the U.S. Bureau of Economic Analysis.¹⁰⁹ Other estimates analyzing how similarly designed carbon dividends proposals might impact U.S. GDP have projected an added \$80-\$90 billion in GDP by 2025.¹¹⁰

¹⁰⁷ “About NERA Economic Consulting,” NERA Economic Consulting, 2021, <https://www.nera.com/about.html>.

¹⁰⁸ Anne Smith et al., “Economic Impacts of the Climate Leadership Council’s Carbon Dividends Plan Compared to Regulations Achieving Equivalent Emissions Reductions Volume I: Analysis Insights for Policymakers,” December 2020, 7, https://clcouncil.org/reports/NERA_CLC_VOL1_Policy_Summary_121020.pdf.

¹⁰⁹ “Gross Domestic Product, Fourth Quarter and Year 2019 (Advance Estimate),” U.S. Bureau of Economic Analysis (BEA), January 30, 2020, <https://www.bea.gov/news/2020/gross-domestic-product-fourth-quarter-and-year-2019-advance-estimate>.

¹¹⁰ Scott Nystrom and Patrick Luckow, “The Economic, Climate, Fiscal, Power, and Demographic Impact of a National Fee-and-Dividend Carbon Tax” (Regional Economic Models, Inc. (REMI) / Synapse Energy Economics

Empirical Evidence of a Carbon Fee's Impact on Economic Growth (GDP)

Recent literature which reviews the economic impacts of carbon pricing, and particularly the impacts of carbon taxes, which have already been implemented in geographic contexts outside the U.S. have argued that it is unlikely that carbon taxes have a negative impact on the economy.¹¹¹ In fact, based on data retrieved from economies around the world which have already implemented a carbon price, researchers have found that in most cases, carbon taxes have had a net positive impact on GDP growth and employment.¹¹² Most significantly, however, there is little evidence that carbon taxes have had “adverse macroeconomic impacts”, especially when considering economies in the European context.¹¹³ Other research has also demonstrated that the carbon tax in the Canadian province of British Columbia¹¹⁴ has not resulted in negative impacts on GDP.¹¹⁵ While these analyses were conducted with a focus on foreign economies, it is plausible that they present significant findings which could be applicable to the United States. Absent the actual implementation of a nationwide carbon tax in the United States, drawing evidence from how similarly designed policies have performed in other countries is a reasonable and logical tool of analysis.¹¹⁶

Models of the GDP Impacts of a Federal Carbon Fee

Inc., June 9, 2014), 8, <https://11bup83sxdss1xze1i3lp04-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/The-Economic-Climate-Fiscal-Power-and-Demographic-Impact-of-a-National-Fee-and-Dividend-Carbon-Tax-5.25.18.pdf>.

¹¹¹ Gilbert E. Metcalf and James H. Stock, “Measuring the Macroeconomic Impact of Carbon Taxes,” *AEA Papers and Proceedings* 110 (2020): 101–6, <https://doi.org/10.1257/pandp.20201081>.

¹¹² Metcalf and Stock, 8.

¹¹³ Metcalf and Stock, 8.

¹¹⁴ Ministry of Environment and Climate Change Strategy, “British Columbia’s Carbon Tax,” Province of British Columbia (Province of British Columbia, 2021), <https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax>.

¹¹⁵ Gilbert E. Metcalf, “On the Economics of a Carbon Tax for the United States,” *Brookings Papers on Economic Activity*, 2019, 31.

¹¹⁶ Using empirical evidence from other contexts is a method used in Stavins, 2019 to measure the effectiveness and impacts of carbon taxes and cap and trade, as well as a recognized analytical method in policy instrument analysis proposed in Sawicki, 2015.

Numerous studies have presented models to predict the macroeconomic impacts of a federal carbon tax implemented in the United States. Models of the economic impacts of a U.S. federal carbon tax align well with empirical findings by economists Gilbert Metcalf and James Stock that carbon taxes in most cases have a small effect on GDP. One report published by Diamond and Zodrow compared three versions of a federal carbon tax with different revenue use options including a payroll tax reduction, equal per-household rebates, and a combined proposal to reduce national debt in concert with providing equal rebates to Americans over time. The study found that a policy which rebates revenues back to citizens would result in more negative short and long-term impacts on GDP, causing it to shrink by about 0.4%.¹¹⁷ For a policy that used revenues to reduce payroll taxes, GDP increased by 0.5% in the long term, despite having negative macroeconomic impacts initially.¹¹⁸ This is likely because decreased payroll taxes would be expected to drive up consumption, total investment, and the labor supply. Finally, a policy which distributes revenues toward reducing the national debt would also yield a slightly positive impact on long-run GDP, although consumption and the labor supply would fall. It is important to note that these estimates do not account for the likely positive economic impacts resulting from a carbon tax's (or in the case of the CLC proposal, carbon fee and dividend) simultaneous reductions in air pollution and potential simplification of other regulatory frameworks.¹¹⁹

CLC Estimates of a Carbon Dividend's Impact on Unemployment

¹¹⁷ John Diamond and George Zodrow, "The Effects of Carbon Tax Policies on the US Economy and the Welfare of Households" (Columbia SIPA Center on Global Energy Policy and Rice University's Baker Institute for Public Policy, July 2018), 5,

https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Effects_of_CarbonTaxPolicies_US_Economy_Welfar_of_Households.pdf.

¹¹⁸ Diamond and Zodrow, 5.

¹¹⁹ Kaufman and Gordon, "The Energy, Economic, and Emissions Impacts of a Federal US Carbon Tax," 7.

The CLC-commissioned Thunder Said Energy report analyzing the Baker-Shultz plan's impact on the economy used an economy-wide model to predict possible impacts on job creation. The report found that implementing the CLC plan would create as many 195,000 new jobs in 2023, soon after its potential enactment.¹²⁰ Further, the report anticipates \$1.4 trillion of capital investment in new technologies resulting from the market signals created by the CLC plan, which would make it possible for as many as 1.6 million "new energy-related construction and operational jobs" to be created by 2035.¹²¹ Thunder Said Energy predicts that placing a steep price on carbon with a strong border adjustment fee before the end of the decade would force manufacturing supply chains to become more localized, initiating additional cost savings and "returning jobs to the United States" which are not represented in the estimates laid out in the study.

Independent Estimates of the Impact of a Carbon Fee on Unemployment

While the reports published by CLC and its partnering organizations make strong claims that a carbon dividend would have a positive impact on creating jobs in manufacturing and in the clean energy sector, it is important to compare these estimates with independent analyses. Examining the revenue-neutral carbon tax, which was implemented in British Columbia in 2008, there is some empirical evidence to back up the claims that a policy like the CLC proposal could have a net positive impact on unemployment and job creation. A study examining the employment impacts of the policy through 2013 found that there were small but statistically significant increases in employment during the first years of the policy, suggesting that a revenue-neutral carbon fee may not have a negative impact on employment.¹²² While there were

¹²⁰ West, "Thunder Said Energy Climate Leadership Council Analysis," 1.

¹²¹ West, 1.

¹²² Akio Yamazaki, "Jobs and Climate Policy: Evidence from British Columbia's Revenue-Neutral Carbon Tax," *Journal of Environmental Economics and Management* 83 (2017): 197, <https://doi.org/10.1016/j.jeem.2017.03.003>.

declines in employment in emissions intensive industries, there were significant gains in “clean service industries”.¹²³ However, when aggregating across all industries, researchers found that positive employment effects experienced in labor-intensive industries were enough to outweigh job losses in negatively affected industries.¹²⁴ One possible reason for this is that the revenues which were redistributed to people living in British Columbia through income tax reductions, corporate tax reductions, and lump sum payments were then used for additional spending across all industries.¹²⁵ This additional revenue for businesses creates more demand for labor, and thus has a positive impact on unemployment. It should be noted that while overall employment may not have worsened, the job losses in emissions intensive industries are still important to consider. Workers in these industries may be able to transition to other sectors, but policies such as a carbon tax or carbon fee and dividend are likely to cause real challenges for those who lose their jobs.

Empirical observations demonstrating little net employment effects from a carbon tax align well with predictions of recently published models showing how a carbon tax might affect the American economy. For example, policy analyst Marc Hafstead and economist Robertson Williams’ 2016 paper found that pollution taxes can lead to reductions in employment for polluting sectors of the economy but are balanced by similarly sized gains in employment in nonpolluting sectors.¹²⁶ This finding bolsters empirical evidence that a carbon tax or carbon fee may have a neutral or positive effect on overall employment. However, the distributional effects

¹²³ Yamazaki, 212.

¹²⁴ Yamazaki, 214.

¹²⁵ Akio Yamazaki, “Research Note: It’s Not a Job Killing Policy - The Case of BC’s Revenue Neutral Carbon Tax” (Sustainable Prosperity, n.d.), 5, <https://institut.intelliprosperite.ca/sites/default/files/jobs-and-bc-carbon-tax.pdf>.

¹²⁶ Marc AC Hafstead and Robertson C. Williams, “Unemployment and Environmental Regulation in General Equilibrium,” *Journal of Public Economics* 160 (2018): 50–65, <https://doi.org/10.1016/j.jpubeco.2018.01.013>.

of significant reallocations of labor demand across industries would have an important impact which requires serious consideration.

CLC Estimates of the Distributional Impacts of a Carbon Fee and Dividend

The CLC commissioned a 2020 report to model the expected distributional impacts from the Baker-Shultz Plan. The analysis was done by Oxford Economics, a leading firm specializing in global forecasting and quantitative analysis. The report discusses modelling of disposable household incomes across a variety of geographical regions, and for all 50 states in the first and fifth years of the Baker-Shultz Plan's implementation. A key topline finding of the report was that in the fifth year of the plan, seven of ten income deciles would be better off in terms of real household disposable income in year five of the plan.¹²⁷ In year one of the plan's implementation, 11 states were projected to have all ten of their respective income deciles have a positive impact, while all other states had nine out of ten of their income deciles experience positive impacts.¹²⁸ The states which experienced the best outcomes in year one of the policy include Arizona, Arkansas, Idaho, Indiana, Louisiana, Michigan, Mississippi, Oklahoma, Tennessee, Texas, and Wyoming. A similar trend is observable for projected state-by-state impacts on households in year five of the policy. For all states, at least seven of ten income deciles are positively impacted. The hardest hit states include Alaska, California, Colorado, Connecticut, Hawaii, Maryland, Massachusetts, New Jersey, New York, North Dakota, South Dakota, and Wyoming.¹²⁹ However, for all of these states, seven of ten income deciles are still better off in year five of the policy. In the other 38 states, better outcomes are projected by the

¹²⁷ Michael Kleiman, "National & State Level Household Income Distributional Analysis of Baker-Shultz Carbon Dividends Plan" (Oxford Economics, September 2020), <https://clcouncil.org/reports/Oxford-household-income-distributional-analysis.pdf>.

¹²⁸ Kleiman, 2.

¹²⁹ Kleiman, 3.

Oxford Economics report. Nationally, in both year one and year five of the policy, the lowest income decile is expected to have the largest positive change in total real household disposable income from baseline projections (Increasing above baseline projections by 4.2% in both year one and year five of the policy).¹³⁰ Meanwhile, the top earning decile is expected to see the largest negative change in household disposable incomes.

The underlying data and methods behind the findings of the Oxford Economics report have not been made publicly available. It is somewhat surprising that this report predicts that a state which has already begun sourcing significant portions of electricity generation from renewable energy, such as California, would experience similar distributional impacts from a carbon fee and dividend as a state which is heavily reliant on coal, such as Wyoming. Based on language included in the topline findings of this report, it seems possible that these projections did not take into account the relative carbon footprints of each state which would be vital in determining how costly a carbon dividend would be for a given region.¹³¹

Independent Estimates of the Distributional Impacts of a Carbon Tax and Dividend

Numerous independent analyses have examined questions around the distributional impact and equity implications of a carbon dividend across various income levels. In a report prepared by researchers at the Baker Institute of Public Policy at Rice University, a carbon fee paired with uniform rebates for every American household was found to be highly progressive.¹³² Modeling showed that nearly all of the bottom income deciles would experience welfare gains while the richest income groups made up the few segments of the population who

¹³⁰ Kleiman, 3.

¹³¹ Tomas Green and Christopher Knittel, “Distributed Effects of Climate Policy: A Machine Learning Approach,” Working Paper (MIT Center for Energy and Environmental Policy Research, September 2020), 35, <http://cepr.mit.edu/files/papers/roosevelt-project/The-Roosevelt-Project-WP-3.pdf>.

¹³² Diamond and Zodrow, “The Effects of Carbon Tax Policies on the US Economy and the Welfare of Households,” 25.

experienced welfare losses.¹³³ Researchers have predicted that equal household rebates from a carbon fee would likely far exceed the additional amount paid for consumer goods by low-income households in the bottom 20% of the income distribution.¹³⁴ Furthermore, a carbon fee in addition to achieving greenhouse gas emissions reductions would likely reduce other forms of air pollution harmful to human health as a co-benefit. Given that low-income households are exposed to air pollution at a disproportionate rate, a carbon dividend policy may disproportionately benefit these communities through auxiliary health benefits which is not included in most modelling of distributional outcomes.¹³⁵

While the CLC plan has been touted for its progressive features, critics have also raised concerns about potentially regressive elements of the plan's design. For example, while most estimates in the scholarly literature predict that equal household lump sum payments (dividends/rebates) would compensate for increases in energy prices and other products, some have argued that the marginal emissions reductions achieved by the policy do not justify raising a wide range of day-to-day costs for low-income families.¹³⁶ Understandably, the downstream impacts of a carbon fee on key economic variables like the price of energy is uncertain, and even some of the CLC's own estimates state that the Baker-Shultz plan could "increase home heating costs by between \$110 and \$2,600," a wide range that could exceed the amount of the individual carbon dividends.¹³⁷ This is concerning, given that low-income households spend a disproportionate share of their income on energy compared to higher income households.¹³⁸ To

¹³³ Diamond and Zodrow, 25.

¹³⁴ Kaufman and Gordon, "The Energy, Economic, and Emissions Impacts of a Federal US Carbon Tax," 6.

¹³⁵ Kaufman and Gordon, 6.

¹³⁶ McGillis, "Carbon Tax Update, August 2020,".

¹³⁷ McGillis, "Carbon Tax Update, August 2020."

¹³⁸ Jason Bordoff and John Larsen, "US Carbon Tax Design: Options and Implications" (Columbia SIPA Center on Global Energy Policy, January 2018), 49, https://www.energypolicy.columbia.edu/sites/default/files/pictures/CGEPCarbonTaxDesignOptions118_1.pdf.

mitigate these and other distributional concerns, some have argued that payments could instead be redistributed to those who bear the greatest costs of climate change.¹³⁹

It's worth noting that the intent of a carbon tax or carbon fee is to alter incentives throughout the economy such that firms and individuals will change their behavior to participate in lower emitting activities. Under a carbon price policy, this would likely require some increase in costs over time on emissions-intensive actions relative to lower-emitting alternatives, even for those at the lower end of the income distribution. However, it is possible that a more progressive rebate structure could be designed to give larger dividends to lower-income households instead of equal rebates to all households. That said, this alteration to the CLC proposal would make it significantly more complicated and could drive up the administrative costs of the program leading to a less efficient use of revenues. To address the potential burden of a carbon price on lower income individuals and families, perhaps other policies targeted at addressing income inequality more broadly would be a better approach such as raising minimum wage or expanding the Earned Income Tax Credit EITC.

Part V: Alternative Carbon Pricing Options from the 116th Congress

It is important to note that several bills were introduced in the 116th Congress which employed a similar approach for carbon pricing to the Baker-Shultz Plan, including those listed in Appendix A.¹⁴⁰ There were at least ten bills introduced which included a carbon tax or carbon fee mechanism, and one bill proposing a revenue-neutral cap-and-trade system with revenues

¹³⁹ McGillis, "Carbon Tax Update, August 2020."

¹⁴⁰ Jason Ye, "Carbon Pricing Proposals in the 116th Congress" (Center for Climate and Energy Solutions, September 2020), <https://web.archive.org/web/20201003221831/https://www.c2es.org/site/assets/uploads/2020/08/carbon-pricing-proposals-in-the-116th-congress.pdf>.

directed back to taxpayers through a dividend.¹⁴¹ Most of the carbon taxes would apply a price on carbon upstream or midstream in the economy like the Baker-Shultz plan. However, they differ in their respective starting carbon prices, price acceleration rates, and proposals for altering related federal regulations.

Differences in Starting Carbon Prices

Across the carbon pricing bills introduced during the 116th Congress, there was significant variation between the starting prices per metric ton of carbon. Starting carbon prices for proposals ranged from \$15 per metric ton to \$52 per metric ton. The Energy Innovation and Carbon Dividend Act of 2019 (H.R.763) introduced by Representatives Ted Deutch (D-Fla.) and Francis Rooney (R-Fla.) incorporated a \$15 price per metric ton of carbon to start, while The American Opportunity Carbon Fee Act of 2019 (S.1128) introduced by Senators Sheldon Whitehouse (D-R.I.), Brian Schatz (D-Hawaii), Martin Heinrich (D-N.M.), and Kirsten Gillibrand (D-N.Y.) incorporated a \$52 per metric ton price on carbon.¹⁴² Notably, the CLC proposal starting carbon price falls in between these two carbon prices, like most of the other proposals, at \$40 (\$2017)/metric ton of carbon. Although the starting fee on carbon is important to consider, it is likely that the acceleration rate of a given policy's carbon price is more important for reducing emissions in the long run. After all, the acceleration rate of the carbon price is what determines the long-term price signal given by the policy which firms will need to adjust to in the future.

Differences in Carbon Price Accelerators

¹⁴¹ Marc Hafstead, "Carbon Pricing Bill Tracker," Resources for the Future, October 1, 2020, <https://www.rff.org/publications/data-tools/carbon-pricing-bill-tracker/>; Ye, "Carbon Pricing Proposals in the 116th Congress," 1.

¹⁴²Ye, "Carbon Pricing Proposals in the 116th Congress," 2–5.

The carbon pricing proposals from the 116th Congress proposed different mechanisms for raising economy-wide carbon prices over time. Some bills called for carbon prices to increase annually by a certain percentage, while others planned to increase carbon prices by a certain dollar amount over a certain time frame. For example, H.R. 763 employed a \$10 annual increase in its carbon price, which would have risen to \$15 per year if emissions targets were not met. On the other hand, S. 1128 included a 6% per year above inflation escalation rate, similar to the CLC proposal. Proposals introduced by Reps. Rooney, Lipinski, Larson, and Fitzpatrick, and Senator Durbin would increase carbon prices annually above inflation respectively by 5% per year, 2.5% per year, 6% per year, and 5% per year. The carbon price acceleration mechanism for this later set of proposals represents a similar approach to the accelerator proposed as part of the Baker-Shultz plan. While the Baker-Shultz plan has not specified a finalized version of its carbon price accelerator, it is likely that its carbon price would rise between 2-5% per year, similar to many of the proposals announced during the 116th Congress.

Differences in Emissions Targets

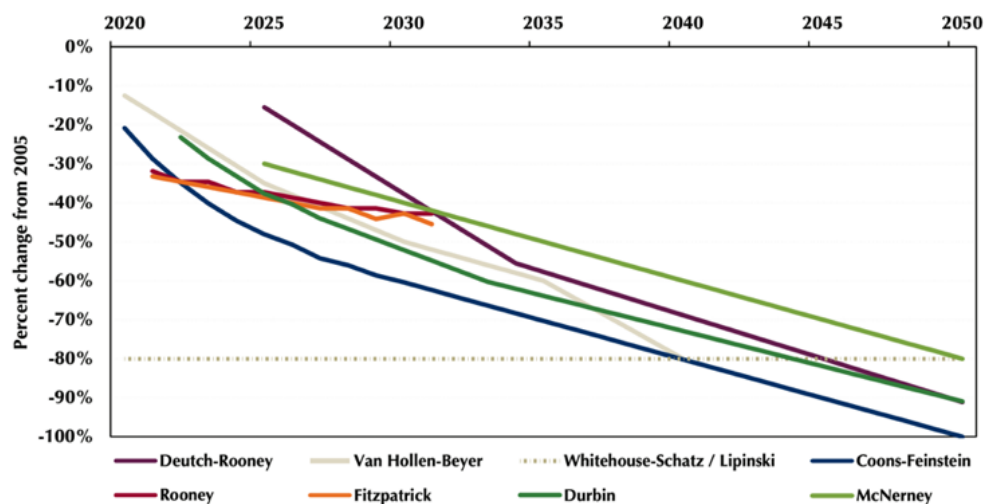
Another significant way in which carbon pricing proposals from the 116th Congress differ is in their respective emissions targets. H.R. 763 includes an emissions reduction target of 90% below 2016 levels by 2050 (91% below 2005).¹⁴³ Meanwhile, S. 1128 increase its carbon price by 6% per year over inflation until emissions are 80% below 2005 levels.¹⁴⁴ This target of achieving emissions which are 80% below 2005 levels at some point in the future is shared by H.R. 8175 (introduced by Rep. Jerry McNerney (D-Calif.)). The Climate Action Rebate Act of 2019 (S.2284 and H.R.4051) introduced by Senators. Chris Coons (D-Del.) and Dianne Feinstein (D-Calif.), and Representative Jimmy Panetta (D-Calif.) included an emissions target of 100

¹⁴³ Ye, 3.

¹⁴⁴ Ye, 3.

percent below 2017 levels by 2050. S. 4484 introduced by Senator Dick Durbin (D-Ill.) included an emissions reduction target of 90 percent below 2018 levels by 2050.¹⁴⁵ The graph below, created by the Center for Climate and Energy Solutions¹⁴⁶ clearly illustrates a comparison of the various proposals and their respective emissions schedules.

FIGURE 2: Emission reduction target for carbon pricing proposals



The figure shows the emissions reduction targets relative to 2005 greenhouse gas emissions for nine carbon pricing proposals, four of which go out to 2050, one to 2040, and two to 2031. The Whitehouse-Schatz and Lipinski proposals have an emissions target of 80 percent below 2005 levels but with no target date, which is represented here as a horizontal line.

For context, the CLC proposal has been estimated to reduce emissions by compared to 2005 levels, 39% by 2025 and 51% by 2035.¹⁴⁷ An examination of Congressional carbon pricing bills reveals the CLC proposal as comparatively less ambitious in its emissions reductions goals than multiple alternative proposals. However, the slower CLC emissions reduction targets still would achieve U.S. targets made as part of the Paris Agreement.

Differences in Revenue Use

¹⁴⁵ Ye, 3.

¹⁴⁶ Ye, 4.

¹⁴⁷ Bailey and Bertelsen, “Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO₂ Reduction By 2035,” 1.

While the CLC proposal's revenue use allocation distributing equal dividends to all Americans, there are other policy options for how revenue from a carbon fee or carbon tax could be spent including payroll tax reductions, national deficit reductions, corporate tax reductions, or increased government spending on other programs.¹⁴⁸ Of the ten proposed carbon taxes, five used some portion of the generated revenues for a rebate paid back to the American people in a similar fashion to the Baker-Shultz plan.¹⁴⁹ These included H.R. 763, S.2284/H.R.4051, H.R. 4142, S. 4484, and H.R. 8175. Among the proposals including a carbon rebate or dividend, there were differences in the percentage of total revenue generated by the policy allocated to rebates. Some proposals proposed re-investing a portion of the revenues into other programs such as a grant for low-income households, infrastructure resilience, research and development for low emissions technologies, and worker transition assistance programs.¹⁵⁰ In addition to these proposals, the lone cap-and-trade proposal from the 116th Congress, (S.940/H.R.1960) would direct revenues from its allowance auctioning program back to the American people as a dividend. Alternatively, S.1128, H.R. 4058, H.R. 3966, H.R. 5457, all would have directed a substantial portion of their revenues to reducing payroll taxes or granting tax credits.¹⁵¹ Policy analysts at Columbia University have argued that using carbon tax revenue for rebates would achieve better macroeconomic outcomes than other revenue use options.¹⁵² Meanwhile, using revenues used for payroll tax cuts would boost the economy by incentivizing work and revenues

¹⁴⁸ Kaufman and Gordon, "The Energy, Economic, and Emissions Impacts of a Federal US Carbon Tax," 5.

¹⁴⁹Ye, "Carbon Pricing Proposals in the 116th Congress," 16–18.

¹⁵⁰ Ye, 16.

¹⁵¹ Ye, 16–18.

¹⁵² Noah Kaufman, "A Comparison of the Bipartisan Energy Innovation and Carbon Dividend Act with Other Carbon Tax Proposals," Working Paper (Columbia SIPA Center on Global Energy Policy, November 2018), 2, https://energypolicy.columbia.edu/sites/default/files/pictures/DeutchCarbonTax-CGEP_Commentary_NEW.pdf.

used for other investments could boost infrastructure transitions and climate change adaptation.¹⁵³

Differences in Proposed Regulatory Relief

Finally, each of the 116th Congress carbon pricing proposals included varied regulatory alterations for existing rules relating to greenhouse gas emissions. S. 1128 did not propose any regulatory alteration, making it the only proposal which did not alter other regulatory policy relating to climate change.¹⁵⁴ Meanwhile other proposals would have eliminated stationary source greenhouse gas regulations under the Clean Air Act (CAA) with various caveats and timelines.¹⁵⁵ This would mean that policies resembling the Clean Power Plan or Affordable Clean Energy rule to regulate stationary sources such as power plants could not be established in the future.¹⁵⁶ Some Congressional carbon pricing proposals include an outright moratorium on these regulations, while others would eliminate them until 2025, 2029, or 2030. If emissions targets of these proposals were not met, greenhouse gas regulatory authority under the Clean Air Act would be reinstated. The lone cap-and-trade proposal (Van Hollen-Beyer proposal) would require the EPA administrator to issue new regulations for emissions not covered by the carbon price as well as emissions from food production. None of the carbon pricing plans from the 116th Congress would have affected tort liability for historically high emissions firms as was previously proposed under early drafts of the Baker-Shultz proposal.

Part VI: Political Feasibility: Can an Economy-Wide Carbon Price Get Passed into Law?

¹⁵³ Kaufman, 2.

¹⁵⁴ Kaufman, 6.

¹⁵⁵ Ye, “Carbon Pricing Proposals in the 116th Congress,” 4.

¹⁵⁶ Kaufman, “A Comparison of the Bipartisan Energy Innovation and Carbon Dividend Act with Other Carbon Tax Proposals,” 6; Martin Levy, “President-Elect Biden Supports a ‘Carbon Enforcement Mechanism’ - Could That Mean a Price on Carbon? - Environmental & Energy Law Program,” Harvard Law School, November 15, 2020, <http://eelp.law.harvard.edu/2020/11/president-elect-biden-supports-a-carbon-enforcement-mechanism-could-that-mean-a-price-on-carbon/>.

Determining the residual impacts of a policy are centrally important in a complete analysis, projections and predictions are meaningless if the proposed policy cannot feasibly get passed into law and overcome political barriers. The following section will delve into whether a carbon price such as the one proposed in the Baker-Shultz plan or those introduced during the 116th Congress could feasibly garner enough votes in Congress to get passed into law, and whether political support for this type of policy could be sustained over time.

Key Stakeholders and Partners

The CLC proposal boasts an impressively long and powerful list of supporting organizations and leaders. In 2017, the Climate Leadership Council (CLC) announced its proposal for a revenue neutral “carbon dividends program”, backed by a group of large companies, NGO’s, economists, and policy experts.¹⁵⁷ While the idea of a revenue neutral carbon dividend scheme wasn’t new, the display of combined support from high profile public officials and economists, along with backing from fossil fuel companies was the first of its kind in the U.S. With the support of high-profile members of both parties, carbon dividends became a policy that was seen to have a real chance of gaining widespread bipartisan backing in Congress.

Beyond its founding members and member organizations, the CLC works in tandem with the organization Americans for Carbon Dividends (AFCD), a 501c4 lobbying organization funded through sizeable contributions from high-net-worth individuals and corporations.¹⁵⁸ In essence, it represents the lobbying arm of the CLC. In 2019, AFCD had raised \$5 million to drive political support for the CLC proposal.¹⁵⁹ These financial contributions came from

¹⁵⁷ “Corporate Founding Members”; Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” iii–v.

¹⁵⁸ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” 11.

¹⁵⁹ Zack Coleman, “Business Group Pushes New ‘climate Dividend’ Plan,” *Politico Pro*, February 13, 2020, <https://subscriber-politicopro-com.ezp-prod1.hul.harvard.edu/article/2020/02/business-group-pushes-new-climate-dividend-plan-1879194>.

industries including the energy, auto, and tech sectors. Exxon Mobil gave \$1 million to AFCD to lobby for the Baker-Shultz plan, becoming the first oil company to do so.¹⁶⁰

The recent withdrawal of oil giant Total, from the American Petroleum Institute (API) is indicative of the potential for other oil companies to support efforts aimed at protecting and furthering emissions reductions policies.¹⁶¹ Total cited a misalignment with API across six areas relating to climate action as the reason for its withdrawal. On January 15th, 2021, Total explained in a statement that one of the key differences between itself and API, was an only partial alignment regarding Total's "belief in the necessity to implement carbon pricing". Not long after that, reports surfaced about API's updated position on carbon pricing. A draft statement from API said, "API supports economy-wide carbon pricing as the primary government climate policy instrument to reduce CO2 emissions while helping keep energy affordable, instead of mandates or prescriptive regulatory action".¹⁶² These recent events suggest a potential shift in priorities among large oil companies and a willingness to break from the status quo to support policies such as carbon pricing. Additionally, one of the largest business interest groups¹⁶³ and contributors to Republican lawmakers, the U.S. Chamber of Commerce, recently stated its support of "a market-based approach to accelerate GHG emissions reductions across the U.S. economy".¹⁶⁴ If the priorities of big oil companies and business interests are shifting toward a

¹⁶⁰ Tom DiChristopher, "Exxon Mobil Pledges \$1 Million to Campaign to Promote Carbon Tax," *CNBC*, October 9, 2018, sec. Energy, <https://www.cnbc.com/2018/10/09/exxon-mobil-pledges-1-million-to-campaign-to-promote-carbon-tax.html>.

¹⁶¹ "Total Withdraws from the American Petroleum Institute," Total.com, January 15, 2021, <https://www.total.com/media/news/press-releases/total-withdraws-from-the-american-petroleum-institute>.

¹⁶² "Oil Trade Group Is Poised to Endorse Carbon Pricing - WSJ," accessed March 22, 2021, https://www.wsj.com/articles/oil-trade-group-considers-endorsing-carbon-pricing-11614640681?st=236f93upeo5pskf&reflink=share_mobilewebshare.

¹⁶³ "About the U.S. Chamber of Commerce," U.S. Chamber of Commerce, November 14, 2013, <https://www.uschamber.com/about/about-the-us-chamber-of-commerce>.

¹⁶⁴ "Our Approach to Climate Change," U.S. Chamber of Commerce, n.d., <https://www.uschamber.com/climate-change-position>.

strategy that prioritizes emissions reductions, there is potential that CLC and AFCD could find even broader and deeper support from companies interested in a market-based approach to climate change.

In addition to having the backing of major oil producers and business groups, AFCD is chaired by Trent Lott, the former Republican U.S. Senate Majority Leader, and John Breaux, former Democratic Senate Deputy Majority Whip.¹⁶⁵ The involvement of these former elected officials gives AFCD access to political networks and bipartisan political clout, both of which will be necessary for the passage of a carbon dividends plan. However, whether the involvement of former players in the Republican and Democratic parties will be enough to influence legislative support for the Baker-Shultz plan among currently elected legislators in Congress remains unknown.

While work remains to be done for the CLC to garner political support for the Baker-Shultz plan among elected officials in Congress, they do have an important ally in the executive branch. Recently confirmed Secretary of the Treasury Janet Yellen was a founding member of CLC¹⁶⁶ and has repeatedly voiced her support of carbon pricing as a key tool for policymakers to address climate change. For example, in her written testimony to the Senate Finance Committee during her recent cabinet confirmation hearings Yellen expressed her belief that “[w]e cannot solve the climate crisis without effective carbon pricing. The President supports an enforcement mechanism that requires polluters to bear the full cost of the carbon pollution they are emitting. I am deeply engaged on this issue and, if confirmed, will continually discuss my views and

¹⁶⁵ Trent Lott and John Breaux, “Here’s How to Break the Impasse on Climate,” *Americans for Carbon Dividends* (blog), October 24, 2019, <https://www.afcd.org/heres-how-to-break-the-impasse-on-climate/>.

¹⁶⁶ “Founding Members,” Climate Leadership Council, n.d., <https://clccouncil.org/founding-members/>.

thinking with the President and our entire team”.¹⁶⁷ Clearly, Yellen occupies a powerful position in the executive branch and has demonstrated interest in driving more support in the Biden-Harris administration for carbon tax policies. She represents a key ally for CLC and could be an important partner for those hoping for support from the White House on key carbon pricing proposals.

Public Support for Carbon Pricing and the Carbon Dividends Plan

While gaining the support of large corporations and political insiders has been a major step in passing a potential version of the Baker-Shultz plan, gauging public support for the proposal or similar policies is also important in determining its political viability. A recent national survey carried out by the Yale Program on Climate Change Communication with the George Mason University Center for Climate Change Communication found that 67% of registered voters support “requiring fossil fuel companies to pay a tax on the carbon pollution they produce and using that revenue to reduce other taxes (such as the federal income tax) by an equal amount (i.e., a revenue-neutral carbon tax)”, including 36% of conservative Republicans.¹⁶⁸ This data demonstrates a potential increase in support for revenue neutral carbon pricing options, as a 2018 survey conducted by the same two organizations asked specifically about the Baker-Shultz plan and found that 58% of voters supported “taxing carbon emissions with the revenue rebated directly to all Americans”.¹⁶⁹ Meanwhile, a survey by Morning Consult, a widely respected market research and polling company, on behalf of CLC found that 65% of

¹⁶⁷“Hearing on the Nomination of Dr. Janet Yellen: Responses by Dr. Yellen” (2020), 112, <https://www.finance.senate.gov/imo/media/doc/Dr%20Janet%20Yellen%20Senate%20Finance%20Committee%20QFRs%2001%2021%202021.pdf>.

¹⁶⁸ Anthony Leiserowitz et al., “Politics & Global Warming” (Yale Program on Climate Change Communication and the George Mason University Center for Climate Change Communication, December 2020), 4, 12, 38, <https://climatecommunication.yale.edu/wp-content/uploads/2021/01/politics-global-warming-december-2020b.pdf>.

¹⁶⁹ “National Survey Results on the Baker-Shultz Carbon Dividends Plan” (Yale Program on Climate Change Communication and the George Mason University Center for Climate Change Communication, October 2018), <https://www.clcouncil.org/media/YaleGMU-Poll-October-2018.pdf>.

Americans say they support charging fossil fuel companies for carbon emissions and rebating revenues back to Americans.¹⁷⁰

Another survey found that Americans would be willing to pay an average of \$177 more (14% more) on their annual household energy bills under a carbon tax.¹⁷¹ Additionally, when considering revenue use options for a carbon tax, 80% of respondents supported using it for the development of solar and wind energy or infrastructure improvements, 70% supported using the revenues to assist displaced workers from the coal industry, and 46% supported returning revenues to Americans in equal amounts.¹⁷² The results of this survey demonstrate there is a diversity of preferences among the American public for how an economy-wide carbon price should allocate its revenues. It also suggests that there may be more politically popular revenue use options than the CLC proposal of rebating revenues back to all Americans.

The Republicans: Support and Opposition:

While the CLC has amassed an impressive list of former leaders from the Republican party, whether currently elected members of the Republican party choose to support a carbon dividend or comprehensive carbon pricing scheme at the federal level is a different question entirely. Kevin McCarthy, the Republican minority leader of the House of Representatives, was recently quoted along with other Republicans saying that carbon taxes are “not needed to spur innovation”.¹⁷³ In 2017, all but six House Republicans voted for a resolution which stated a tax on CO₂ emissions “would be detrimental to American families and businesses, and is not in the

¹⁷⁰ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” 12.

¹⁷¹ Matthew J. Kotchen, Zachary M. Turk, and Anthony A. Leiserowitz, “Public Willingness to Pay for a US Carbon Tax and Preferences for Spending the Revenue,” *Environmental Research Letters* 12, no. 9 (September 2017): 094012, <https://doi.org/10.1088/1748-9326/aa822a>.

¹⁷² Kotchen, Turk, and Leiserowitz.

¹⁷³ Timothy Gardner, “U.S. Carbon Price Group Boosts Lobbying in Congress, Releases Plan,” *Reuters*, February 14, 2020, <https://www.reuters.com/article/us-usa-climate-tax-idUSKBN207250>.

best interest of the United States”.¹⁷⁴ Four years later, significant roadblocks to gaining the support of House Republicans for carbon pricing remain.

While Republican support for a carbon dividends plan in the House of Representatives might bolster the political momentum for economy-wide carbon pricing, it is likely that gaining Republican support the U.S. Senate would be even more consequential, given the 50-50 split between the two major parties entering the 117th Congress. Still, there is a chance that some Republican Senators would consider bipartisan efforts to pass a carbon price or carbon dividends plan. For example, Senator Lisa Murkowski (R-AK) stated in a recent event hosted at the Stanford Institute for Economic Policy Research that carbon pricing “is worth putting on the table” as a policy to address climate change.¹⁷⁵ Senator Mitt Romney has expressed similar sentiments, acknowledging the need to reduce global CO₂ emissions. In 2019, Romney publicly stated that he was “looking at” carbon dividends proposal as a policy to encourage innovation and international emissions reductions.¹⁷⁶ More recently however, it was reported that Senator Romney was interested in carbon pricing, and in particular the Baker-Shultz Plan.¹⁷⁷ He was quoted saying “I am interested in the proposal because it may create incentives for the private sector to develop new technologies that will be adopted globally”.¹⁷⁸ Further, in a recent interview with the New York Times, he stated “I’m very open to a carbon tax, carbon dividend,

¹⁷⁴ Timothy Cama and Juliegrace Brufke, “House Votes to Disavow Carbon Tax,” *The Hill*, July 19, 2018, <https://thehill.com/homenews/house/397848-house-votes-to-disavow-carbon-tax>.

¹⁷⁵ Sobczyk, “Murkowski: Carbon Pricing ‘Worth Putting on the Table’”; “Prospects for Significant Bipartisan Climate-Change Legislation In the Next U.S. Congress: A Conversation with Senators Lisa Murkowski and Sheldon Whitehouse | SIEPR,” October 21, 2020, https://siepr.stanford.edu/events/prospects-significant-bipartisan-climate-change-legislation-next-us-congress-conversation?fbclid=IwAR0iLhxvqg3_RBvwMGcF6P37s_hhccbrF30qfbVQZN3nR_TO_rcgmsT-1PE.

¹⁷⁶ Anthony Adragna, “Romney ‘looking at’ Carbon Dividend Proposal,” *Politico Pro*, August 20, 2019, <https://subscriber-politicopro.com.ezp-prod1.hul.harvard.edu/article/2019/08/romney-looking-at-carbon-dividend-proposal-1673381>.

¹⁷⁷ Josh Siegel, “Mitt Romney Leans in on Carbon Tax to Spur Clean Energy Technology Breakthroughs,” *Washington Examiner*, March 18, 2021, <https://www.washingtonexaminer.com/policy/energy/mitt-romney-leans-in-on-carbon-tax-to-spur-clean-energy-technology-breakthroughs>.

¹⁷⁸ Siegel.

where there's a tax on oil companies and coal companies and so forth," ... "The funds that are raised then go to individual taxpayers so they could meet the costs of the higher price of energy".¹⁷⁹ Given these statements, it seems at the very least possible that Senator Romney could be counted on as a swing vote in support of a carbon dividend plan, such as the one proposed by the CLC and others during the 116th Congress.

To date, few if any Republicans in Congress have come out in strong support of carbon pricing. However, some moderate Republicans seem open to throwing their support behind the right proposal if it comes along. Their support may be necessary given the less than full alignment in the Democratic party behind carbon pricing as a comprehensive climate policy, and slim majority in the Senate.

Support for carbon pricing remains incomplete among Republican members of the current Congress for a carbon dividends plan may remain incomplete, there are some encouraging grassroots groups on the political right which have backed the Baker-Shultz plan. For example, Young Conservatives for Carbon Dividends was created with the intention of backing the Baker-Shultz plan, and uniting young conservative leaders behind carbon pricing.¹⁸⁰ The 501c4 organization was founded by dozens of student leaders of college Republicans clubs across the country and represents the kind of grassroots effort that would likely be necessary to pressure conservative members of Congress to back the Baker-Shultz plan.¹⁸¹ While Young Conservatives for Carbon Dividends is not alone, and other groups like Young Evangelicals for

¹⁷⁹ "DealBook DC Policy Project: Mitt Romney on the Search for Common Ground," *The New York Times*, February 23, 2021, sec. Business, <https://www.nytimes.com/live/2021/02/23/business/dealbook-dc-policy-project>.

¹⁸⁰ "Young Conservatives for Carbon Dividends (YCCD) Mission Statement," Young Conservatives for Carbon Dividends, n.d., <https://www.yccdaction.org/mission>.

¹⁸¹ "The Co-Founders Young Conservatives for Carbon Dividends (YCCD)," Young Conservatives for Carbon Dividends, n.d., <https://www.yccdaction.org/cofounders>.

Climate Action¹⁸² and RepublicEN¹⁸³ support implementing carbon pricing, it is still likely that gaining the support of well-established special interest groups with greater political clout and resources is more important to pressuring current members of Congress.

The Democrats: Support and Opposition

While there is far more support for climate action among congressional Democrats than congressional Republicans, support for carbon pricing is not uniform across the Democratic caucus. For example, during the 2020 Democratic presidential primary, Senator Bernie Sanders (I-VT) opposed setting a price on carbon, and Senators Elizabeth Warren (D-MA) and Michael Bennet (D-CO) only expressed an openness to the idea.¹⁸⁴

For a carbon tax or carbon dividend bill to pass, it is like that almost every Senate Democrat would need to get in line behind the proposal, as few Senate Republicans seem to support economy-wide carbon pricing. This could pose a significant roadblock to passing carbon pricing legislation through the senate, as moderate Democrats have often expressed doubts about the merits of these types of policy instruments. Senator Joe Manchin (D-W. Va.), who opposed carbon pricing legislation in 2009,¹⁸⁵ would not be a sure vote for an economy-wide carbon price.¹⁸⁶ In a 2021 interview touching on this topic, Manchin said,

“On pricing, let me think about it. You can't use it as a carrot and stick and a penalty. The bottom line is, if we do things and do it right, we can move forward with the tax credits and incentives to get people moving in the direction we need to. That means a cleaner environment, cleaner technology that will be used in all aspects of producing energy.”¹⁸⁷

¹⁸² “Young Evangelicals for Climate Action,” n.d., <https://yecaction.org/>.

¹⁸³ “What We Stand For,” republicEn, n.d., <https://republicen.org/about>. “Young Evangelicals for Climate Action.”

¹⁸⁴ “Carbon Tax, Cap-and-Trade: Where 2020 Democrats Stand,” 2020, <https://www.washingtonpost.com/graphics/politics/policy-2020/climate-change/carbon-tax/>.

¹⁸⁵ Nick Wing, “Joe Manchin Shoots Cap-And-Trade Bill With Rifle In New Ad (VIDEO),” *HuffPost*, October 11, 2010, sec. Politics, https://www.huffpost.com/entry/joe-manchin-ad-dead-aim_n_758457.

¹⁸⁶ Anthony Adragna, “POLITICO Pro Q&A: Sen. Joe Manchin,” *Politico Pro*, January 14, 2021, <https://subscriber-politicopro-com.ezp-prod1.hul.harvard.edu/article/2021/01/politico-pro-q-a-sen-joe-manchin-2028791>.

¹⁸⁷ Adragna.

In another interview when asked if an aggressive carbon pricing bill could be passed in the next couple years he said,

"They want to talk about this as a penalty? Forget it. As long as I'm here and there's 50 votes and it takes 51 to pass it" ... "let me get this straight, you want me to go back to West Virginia and tell voters that I'm going to raise prices on a bunch of stuff, I'm going to knock a bunch of you out of jobs but trust me, the global economy is going to invent technologies? That's not going to happen."¹⁸⁸

While it does appear that Senator Manchin may still prefer other policy approaches over carbon pricing including tax credits, he nonetheless expresses an openness to negotiating to talking about a breadth of solutions that will transition the U.S. energy system to cleaner technologies.¹⁸⁹ That said, Senator Manchin's recent responses to questions asking him whether he would support economy-wide carbon pricing during the 117th Congress demonstrate why proponents of a carbon pricing plan might need to attract members of both parties to their cause, as they likely won't be able to count on every Democrat supporting a carbon pricing bill. Senator Manchin isn't the only Democratic Senator who has expressed misgivings about a carbon price. Democratic Senator Kyrsten Sinema of Arizona voted with the vast majority of House Republicans to condemn a carbon tax in 2017 when she was still a member of the House of Representatives, and it is unclear whether she would change her position to support a carbon dividends plan.¹⁹⁰ Further, Senator John Tester of Montana has been quoted saying he supports tax credits for renewable energy over carbon taxes or cap and trade proposals.¹⁹¹

¹⁸⁸ Mike Palicz and Ed Tarnowski, "Video: 'Forget It.' Joe Manchin Rules Out a Carbon Tax," Americans for Tax Reform, February 5, 2021, <https://www.atr.org/video-forget-it-joe-manchin-rules-out-carbon-tax>.

¹⁸⁹ Josh Siegel, "Energy Chairman Joe Manchin Warns Democrats against Climate Mandates: 'You Cannot Eliminate Your Way to a Cleaner Environment,'" *Washington Examiner*, January 14, 2021, sec. Energy, <https://www.washingtonexaminer.com/policy/energy/energy-chairman-manchin-warns-democrats-against-climate-mandates>.

¹⁹⁰ Cama and Brufke, "House Votes to Disavow Carbon Tax."

¹⁹¹ Tom Lutey, "Billings Gazette: Tester Fields Questions on Climate Change, Gun Control and More at Town Hall Meeting in Billings," U.S. Senator for Montana Jon Tester, October 4, 2019, <https://www.testersenate.gov/news&id=7050>.

While moderate Democrats in the Senate may not yet be on board to support economy-wide carbon pricing, progressives in the Democratic caucus have also expressed their doubts about whether these policies should be the center piece of climate mitigation efforts in the U.S. In two significant Congressional reports released in 2020 on climate change, one produced by the House Select Committee on the Climate Crisis and one by the Senate Democrats' Special Committee on the Climate Crisis, different views on the effectiveness of carbon pricing were expressed. The House select committee's report stated, "carbon pricing is not a silver bullet and should complement a suite of policies to achieve deep pollution reductions and strengthen community resilience to climate impacts."¹⁹² On the other hand, the Senate report stated that the federal government must "use every proven tool at its disposal" including "a federal clean energy standard, emission standards, a carbon price, and/or other market mechanisms to ensure the rapid adoption and scale-up of proven technologies".¹⁹³ Opinions of carbon pricing among congressional Democrats remain heterogenous, making any path toward the passage of a carbon pricing bill less feasible. However, there is a sense of urgency among Democrats to pass comprehensive climate change legislation and a clear openness to discussion of various policy options which could present an opening for proponents of carbon pricing despite the current absence of a solid coalition of lawmakers on their side.

Regulatory Relief as a Political Bargaining Chip for Carbon Pricing?:

¹⁹²Majority Staff for the Select Committee on the Climate Crisis, "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America. Select Committee on the Climate Crisis Majority Staff Report" (116th Congress, June 2020), 9, <https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Climate%20Crisis%20Action%20Plan.pdf>.

¹⁹³ Senate Democrats' Special COmmittee on the Climate Crisis, "The Case for Climate Action: Building a Clean Economy for the American People" (United States Senate, August 25, 2020), 10, https://www.schatz.senate.gov/imo/media/doc/SCCC_Climate_Crisis_Report.pdf.

According to the CLC, the Baker-Shultz plan represents “a series of grand bargains” which will appeal to “environmentalists, businesses and conservatives at the same time”.¹⁹⁴ The Baker-Shultz plan is not the only contemporary carbon pricing plan including a proposal for regulatory relief in exchange for a gradually rising carbon price. CLC argues that the potential appeal of these types of bargains across a diverse range of constituencies is the result of combining a policy which is likely to achieve Paris Agreement emissions commitments, a revenue neutral market based mechanism to achieve emissions reductions, and regulatory relief. The CLC’s carbon dividend proposal would remove “all current and future federal stationary source carbon regulations.”¹⁹⁵ CLC’s stated rationale for pursuing deregulation with a carbon dividend is to give businesses the “flexibility they need to innovate and make long-term investments in a low-carbon future” and to promote economic growth.¹⁹⁶

In the earliest versions of the Baker-Shultz plan, regulatory simplification also included repealing the Clean Power Plan,¹⁹⁷ and ending tort liability for emitters at the state and federal levels.¹⁹⁸ While the Clean Power Plan has since been repealed,¹⁹⁹ critics have raised concerns that trading emitters’ tort liability for a carbon price may not be palatable with parts of the environmental community.²⁰⁰ Eliminating tort liability for high emitters would protect them from lawsuits filed by states, local governments or others for their contributions to climate damage.²⁰¹

¹⁹⁴ Baker and Shultz, “The Baker Shultz Carbon Dividends Plan Bipartisan Climate Roadmap,” vi.

¹⁹⁵ Baker and Shultz, 2.

¹⁹⁶ Baker and Shultz, 3–4.

¹⁹⁷ OAR US EPA, “FACT SHEET: Overview of the Clean Power Plan,” Overviews and Factsheets, August 2015, [fact-sheet-overview-clean-power-plan.html](https://www.epa.gov/fact-sheet-overview-clean-power-plan.html).

¹⁹⁸ James Baker et al., “The Conservative Case for Carbon Dividends” (Climate Leadership Council, n.d.), 3, <https://www.clcouncil.org/media/2017/03/The-Conservative-Case-for-Carbon-Dividends.pdf>.

¹⁹⁹ OAR US EPA, “Affordable Clean Energy Rule,” US EPA, May 10, 2019, <https://www.epa.gov/stationary-sources-air-pollution/affordable-clean-energy-rule>.

²⁰⁰ Kate Yoder, “Republicans Are Backing a ‘carbon Dividend.’ What the Heck Is That?,” *Grist*, June 21, 2018, <https://grist.org/article/republicans-are-backing-a-carbon-dividend-what-the-heck-is-that/>.

²⁰¹ Marianne Lavelle, “Carbon Tax Plans: How They Compare and Why Oil Giants Support One of Them,” *Inside Climate News*, March 7, 2019, <https://insideclimatenews.org/news/07032019/carbon-tax-proposals-compare-baker-shultz-exxon-conocophillips-ccl-congress/>.

Ryan Costello, a former Republican member of the House of Representatives and current managing director at the CLC's lobbying firm, Americans for Carbon Dividends, has argued that eliminating these liabilities will allow firms to invest more money in research and development for low-carbon technologies.²⁰² While tort liability waivers were included in the initial 2017 draft of the Baker-Shultz plan, they have been missing from the regulatory relief packages proposed since. Although many of the corporate backers of the CLC plan and carbon pricing proposals more broadly have maintained their support despite minor tweaks to proposed regulatory relief it is unclear if eliminating of tort-liability is a "must-have" for fossil fuel companies for an acceptable climate policy.

At the same time, analysis of positions of leaders on the political left suggests that Democrats are in many cases unwilling to trade regulatory relief for a carbon price. Regulatory relief represents an evolving aspect of federal carbon pricing legislation that will require more attention if a comprehensive climate bill is ever voted on in Congress. Importantly, the 2020 House Select Committee on the Climate Crisis on report on climate action expressed disapproval of offering "liability relief" or nullification of "Clean Air Act authorities or existing statutory duties to cut pollution in exchange for a carbon price".²⁰³ Clearly, these statements stand in opposition to the type of regulatory relief proposed as part of the Baker-Shultz plan and many of the carbon pricing proposals introduced during the 116th Congress, and call into question whether regulatory rollbacks in exchange for carbon pricing could be a politically feasible bargain.

Budget Reconciliation

²⁰² "About Ryan Costello," AFCD, n.d., <https://www.afcd.org/about-ryan-costello/>; Lavelle, "Carbon Tax Plans."

²⁰³ Majority Staff for the Select Committee on the Climate Crisis, "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America. Select Committee on the Climate Crisis Majority Staff Report," 286.

In the U.S. Senate, 60 votes are needed to pass most legislation. At first glance, this would seem an insurmountable barrier for any carbon pricing bill introduced in the 117th Congress to eventually pass into law. However, there is still a slim legislative pathway available for lawmakers to pass a carbon fee and dividend using a process called budget reconciliation. The Congressional Budget Act of 1974 allows legislation relating to taxes, spending, or the national debt to be exempted from a filibuster in the Senate.²⁰⁴ For ordinary bills, 60 votes would be needed to end a filibuster in opposition to legislation. However, under budget reconciliation, only a simple majority would be required to end a filibuster, essentially lowering the threshold of votes required to pass a bill from 60 votes to 50 votes plus the vote of the Vice President in the case of a 50-50 tie. Carbon prices, including a revenue neutral carbon fee and dividend, could count as policies which would alter in government revenues and spending. This would qualify legislation including a carbon price to be passed with just 50 votes, plus the Vice President. A recent independent analysis by researchers at the Niskanen Center found that “most of the components of existing carbon tax proposals” could be tailored in such a way that they would be germane to the budget reconciliation process.²⁰⁵ This opinion was reflected in a recent statement made by Democratic Senator Sheldon Whitehouse who said “at a minimum, a carbon price, I think, could be a pretty clear budget-related item”.²⁰⁶ However, passing a carbon price or carbon

²⁰⁴ Richard Kogan and David Reich, “Introduction to Budget ‘Reconciliation,’” *Center on Budget and Policy Priorities* (blog), January 21, 2021, <https://www.cbpp.org/research/federal-budget/introduction-to-budget-reconciliation>; Joseph Majkut, Annabelle Swift, and Peter Marsters, “A Carbon Tax in the Context of Budget Reconciliation,” Niskanen Center, February 18, 2021, <https://www.niskanencenter.org/a-carbon-tax-in-the-context-of-budget-reconciliation/>.

²⁰⁵ Joseph Majkut, Peter Marsters, and Annabelle Swift, “A Carbon Tax in the Context of Budget Reconciliation” (Niskanen Center, February 2021), 1, <https://www.niskanencenter.org/wp-content/uploads/2021/02/A-Carbon-Tax-in-the-Context-of-Budget-Reconciliation.pdf>.

²⁰⁶ Molly Christian and Zack Hale, “Buzz Grows around Use of Budget Reconciliation to Advance Energy, Climate Goals,” S&P Global Market Intelligence, October 22, 2020, <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/buzz-grows-around-use-of-budget-reconciliation-to-advance-energy-climate-goals-60878440>.

fee and dividend through the budget reconciliation process would likely prevent accompanied regulatory relief. Analysis by Niskanen Center researchers argued that changes to EPA regulatory authority, similar to the regulatory simplification included in the Baker-Shultz plan and other proposals from the 116th Congress, would not be well suited for passage through budget reconciliation, as they do not count as changes to spending and revenue.²⁰⁷ This limitation of the budget reconciliation process could render proposals such as the Baker-Shultz plan, as currently written, difficult to pass during the 117th Congress.

Overall Political Viability of a Carbon Dividend

Political support for the Baker-Shultz plan and carbon pricing bills generally have much room to grow before it can be said that these types of policies have a good chance of being passed into law. That said, the coalition of interest groups, oil companies, economists, and other stakeholders coming together behind carbon pricing continues to strengthen. However, this may not matter if their support isn't paired with a grassroots movement to pressure lawmakers.

According to renowned political scientist and sociologist Theda Skocpol, one reason the last major carbon pricing proposal failed to pass during the Obama administration was a lacking national supporting organization which could organize support at local and regional levels.²⁰⁸ For future efforts to pass economy-wide carbon pricing bills to be successful, Skocpol has suggested that the political center left will need to be mobilized²⁰⁹ by a policy that the public can understand and is enthusiastic about.²¹⁰

²⁰⁷ Majkut, Marsters, and Swift, "A Carbon Tax in the Context of Budget Reconciliation," 10.

²⁰⁸ Skocpol, "What It Will Take to Counter Extremism and Engage Americans in the Fight against Global Warming," 116.

²⁰⁹ Skocpol, 116.

²¹⁰ Skocpol, 119.

The impressive corporate and non-governmental partners brought together by CLC likely will not have an impact if grassroots organizations are not engaged to pressure lawmakers in their home states and districts. The good news for CLC is that there are some organized networks of support for carbon dividends as previously mentioned. Further, organizations such as the Citizen's Climate Lobby (CCL) have been creating chapter-based organizations to support their version of a carbon dividend for years now and have amassed over 600 local chapters of their organization throughout the United States.²¹¹ If the CLC could combine its coalition of key interest groups and political insiders with the grassroots coalition put together by the Citizen's Climate lobby, a carbon price may feasibly be able to gain the necessary political clout to be passed into law.

Part VII: Chapter Conclusion

This chapter has outlined many of the advantages and drawbacks of an economy-wide carbon price, such as the CLC carbon dividends proposal. These policies can offer substantial opportunities for short-term decarbonization of the power sector and, if properly designed and implemented, send a market signal across all sectors of the economy to innovate new technologies that will assist the U.S. in meeting long-term emissions reductions targets. However, economy-wide carbon pricing policies will need to be complemented by additional measures and investments to achieve net-zero emissions. Carbon pricing can have unequal impacts which are potentially harmful in the short-term for coal-reliant and low-income households. However, revenues generated by carbon prices can be reallocated in a number of ways to address some of these inequities. Finally, while the political prospects for passing a carbon through Congress have improved given the swearing in of a new presidential

²¹¹ "Citizens' Climate Lobby," Citizens' Climate Lobby, 2021, <https://citizensclimatelobby.org>.

Administration and Congress which are both more open to climate action, it doesn't appear likely that an economy-wide carbon price will be enacted into law given current levels of support.

Chapter 3: Federal Emissions Reduction Policies for the Power Sector

Chapter 3 Introduction

The previous chapter outlines many of the advantages and drawbacks of contemporary proposals for economy-wide carbon pricing. Given the significant political barriers to implementing an economy-wide carbon price, it is important to examine other approaches to making meaningful reductions in greenhouse gas emissions. This chapter will focus on contemporary climate mitigation proposals at the federal level that are designed to decarbonize the power sector. Greenhouse gas emissions from the power sector make up 27% of total U.S. emissions, and decarbonizing other sectors such as transportation, the industrial sector, and the residential and commercial sectors is in large part dependent on decarbonizing the power sector.²¹² Therefore, policies aimed at reducing emissions in the power sector could allow further emissions reductions to occur in other sectors as well. This chapter will examine policy proposals focused on the power sector including federal Clean Energy/Electricity Standards (CES) and a closely related set of policies called Tradable Performance Standards (TPS).

It is important to note that these policies do not represent an exhaustive list of the policy options available to policymakers at the federal level to decarbonize the power sector. However, they are representative of policies that are most likely to result in large emissions reductions across the entire economy on a scale that can be compared with the mitigation potential of economy-wide carbon pricing proposals.²¹³ This chapter will discuss the potential of CES and

²¹² OAR US EPA, “Sources of Greenhouse Gas Emissions,” Overviews and Factsheets, US EPA, December 4, 2020, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

²¹³ Joseph E. Aldy, “Promoting Clean Energy in the American Power Sector: A Proposal for a National Clean Energy Standard,” *Environmental Law Reporter* 42, no. 2 (2012): 1.

TPS proposals to compete with emissions reductions promised by carbon pricing proposals, their impacts on the economy, and their political and legal staying power over the long-term.

Part I: Clean Energy/Electricity Standards

During his campaign in 2020, President Biden supported a technology-neutral Energy Efficiency and Clean Electricity Standard (EECES) which would help the United States achieve 100% clean electricity generation by 2035.²¹⁴ Achieving a “100% clean” electricity sector would mean eliminating or drastically reducing 27% of total U.S. greenhouse gas emissions, and Biden’s CES proposal was a major component of his proposed climate agenda.²¹⁵ Proponents of a CES have argued that it could be passed in the U.S. Senate by a simple majority through budget reconciliation, which could make pursuing this type of policy an attractive option for policymakers.²¹⁶

What is a Clean Energy/Electricity Standard (CES)?

A Clean Energy Standard or Clean Electricity Standard (CES) is a sectoral approach to mitigating greenhouse gas emissions in the power sector. A CES “requires a percentage of retail electricity sales to come from low and zero-carbon ‘clean’ electricity sources”.²¹⁷ This requirement is placed on utilities or load serving entities (LSEs) that supply power to consumers. Most CES policies require that LSEs supply an increasing percentage of electricity from clean

²¹⁴ Denis Chow, “How Biden’s Climate Plan Makes Clean Energy by 2035 ‘Very Doable,’” *NBC News*, July 21, 2020, <https://www.nbcnews.com/science/environment/how-biden-s-climate-plan-makes-clean-energy-2035-very-n1234528>; Joe Biden, “The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future,” Joe Biden for President: Official Campaign Website, 2020, <https://joebiden.com/clean-energy/>.

²¹⁵ US EPA, “Sources of Greenhouse Gas Emissions.”

²¹⁶ Leah Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies” (Evergreen Collaborative and Data for Progress, n.d.), 14, <https://www.evergreenaction.com/policy-hub/evergreen-ces-report.pdf>.

²¹⁷ Bipartisan Policy Center, “Pathways to Decarbonization: A National Clean Energy Standard” (Bipartisan Policy Center, n.d.), 1, https://bipartisanpolicy.org/wp-content/uploads/2020/03/BPC_Energy_Clean-Energy-StandardV2.pdf.

sources over time. Clean sources of energy could include wind power, solar power, geothermal power, nuclear power, or power generated at fossil fuel plants with carbon capture and storage.²¹⁸ Different CES proposals adopt different points of regulation with some plans such as the Biden proposal placing clean energy requirements on “utilities and grid operators” while others have proposed regulating “individual companies, regional power pools” or states.

To help regulated entities comply with the clean energy requirements of a CES, these policy proposals often include a credit tradable credit system. A CES with a credit trading system would in many ways operate as a carbon price for the power sector. Under this policy regime, regulators would prescribe a certain number of clean energy credits that an LSE would need to obtain to comply with the policy. LSEs would be able to acquire clean energy credits in two ways. First, they could earn credits by including the prescribed percentages of clean energy in their electricity generation mix. Second, LSEs which haven’t met clean energy generation requirements could buy clean energy credits from LSEs already in compliance with the CES by including enough clean energy in their generation mixes. Some CES proposals also include an Alternative Compliance Payment (ACP) mechanism, which would allow LSEs to make a payment to the government should it not be able to obtain enough clean energy credits due to scarcity in the credit trading market.²¹⁹

The price paid for credits by higher emitting LSEs would be similar to a carbon price, as they would have to pay a price for emitting beyond prescribed limits set by a CES. This would maintain incentives to reduce emissions but also allow LSEs, such as utilities, greater flexibility for how they could comply with a CES. While a CES with a clean energy credit trading system

²¹⁸ Bipartisan Policy Center, 1.

²¹⁹ Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies,” 17.

operates as a carbon price for the power sector, it is important to note that many of those backing this type of policy avoid calling it a carbon price for political reasons. By creating a financial incentive for firms in the power sector to decarbonize, a CES has the potential to create a lasting market signal that boosts technological innovation and investment in new low-carbon technologies.²²⁰ In 2020 there were 30 states which had already implemented a CES or CES-like policy, indicating that policymakers, regulators, and regulated entities in the power sector would have valuable experiences at the state level to draw upon for implementation of a broader federal CES.²²¹

Part II: Tradable Performance Standards (TPS)

What is a Tradable Performance Standard (TPS)

A Tradable Performance Standard (TPS) is a similar policy to a CES, and they are commonly used interchangeably in policy proposals. Where a CES would specify requirements for utilities or power plants to include a certain percentage of clean energy in their generation mixes, a TPS would establish a “performance goal” that required certain emissions intensity rates to be met per unit of power produced.²²² A TPS would also include a tradable credit system like a CES, where all regulated entities in the power sector would be required to earn or buy a specified number of credits to comply with the policy. Electricity suppliers able to achieve the performance goal would earn credits. Lower emitting suppliers would then be allowed to sell

²²⁰ Bipartisan Policy Center, “Pathways to Decarbonization: A National Clean Energy Standard,” 2.

²²¹ Ashley Lawson, “Clean Energy Standards: Selected Issues for the 117th Congress” (Congressional Research Service, February 22, 2021), 1, <https://fas.org/sgp/crs/misc/R46691.pdf>.

²²² “Tradable Performance Standards: Innovation through Regulation,” Resources for the Future, November 17, 2020, <https://www.rff.org/news/press-releases/tradable-performance-standards-innovation-through-regulation/>; Warwick McKibben, Adele Morris, and Peter Wilcoxon, “Controlling Carbon Emissions from U.S. Power Plants: How a Tradable Performance Standard Compares to a Carbon Tax,” Climate and Energy Economics Discussion Paper (Brookings Institute: The Climate and Energy Economics Project, August 3, 2015), 2, <https://www.brookings.edu/wp-content/uploads/2016/06/TPS-vs-Carbon-tax-with-cover.pdf>.

these credits to higher emitting electricity suppliers, allowing all firms to acquire the required amount of TPS credits for compliance, even if they are not able to meet the emissions performance standard. Recent proposals which have been referred to as a federal CES are often more accurately described as a TPS. For example, a recently introduced bill in the 117th Congress called the Climate Leadership and Environmental Action for our Nation’s Future Act or CLEAN Future Act (H.R. 1512) includes a proposal for a CES.²²³ However, the CES credit system under this proposal grants Zero-Emissions Energy Credits (ZEECs) based on a regulated entity’s emissions intensity, rather than the composition of sources in its generation mix.²²⁴ Thus, the CES in H.R. 1512 more closely resembles a TPS than a traditional CES. In many contemporary policy discussions about designing future regulations for the power sector, this slight semantic differentiation between a CES and TPS is often overlooked. Given their similarity, this chapter will address these policies, their barriers to implementation, and their implications for emissions reductions and the economy together.

Part III: Analysis of CES and TPS Policies

Emissions and Technological Impacts of a CES/TPS Policy

While different CES proposals often define clean energy differently, most contemporary proposals recommend that the power sector be 100% clean by sometime between 2035-2050.²²⁵ To assess the feasibility of achieving such targets, it is important to understand the current generation mix of the power sector. According to the U.S. Energy Information Administration

²²³ “H.R. 1512 To Build a Clean and Prosperous Future by Addressing the Climate Crisis, Protecting the Health and Welfare of All Americans, and Putting the Nation on the Path to a Net-Zero Greenhouse Gas Economy by 2050, and for Other Purposes.,” GovTrack.us, n.d., <https://www.govtrack.us/congress/bills/117/hr1512>.

²²⁴ House Committee on Energy and Commerce, “Summary of the Climate Leadership and Environmental Action for Our Nation’s (CLEAN) Future Act,” Bill Summary (U.S. House of Representatives, March 2021), 2, <https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Section-by-Section%20of%20CLEAN%20Future%20Act%20117th.pdf>.

²²⁵ Lawson, “Clean Energy Standards: Selected Issues for the 117th Congress,” 2.

(EIA), renewable energy supplied 19.8% of electricity generated in the U.S. in 2020, which included generation from sources such as wind, hydropower, solar, biomass, and geothermal.²²⁶ Natural gas, which under some CES proposals would be defined as clean, sourced 40.3% of electricity generation and nuclear power sourced 19.7%.²²⁷ Taken together, renewables, natural gas, and nuclear sources made up 79.8% of U.S. electricity generation in 2020. While it is likely that any federal CES would require that a sizable portion of current generation supplied by natural gas either be reduced, use CCS, or be eliminated altogether, the fact that the power sector is already drawing heavily upon sources which are considered clean by many CES proposals demonstrates that an aggressive timeline to achieve a 100% clean power sector may not be far-fetched. A key determining factor for when the power sector could feasibly transition to being considered 100% clean is how a CES policy would define clean sources. A CES which excludes natural gas generated electricity from qualified clean sources of power would surely require substantially greater transformations of the national energy system and economy than a CES which designated natural gas as a clean source. That said, electricity generated by coal, which made up 19.3% of total generation in 2020, would likely be phased out under a federal CES policy, as most proposals do not include coal as a clean source of power generation.²²⁸

Different CES proposals promise different emissions reduction schedules and targets, with some proposals promising a 60% reduction in power sector emissions over 20 years²²⁹ and others proposing 100% carbon-free power sector over just 14 years.²³⁰ The wide variation among promised emissions targets of different CES proposals requires an examination of the CES

²²⁶ EIA, “Frequently Asked Questions (FAQs) - U.S. Energy Information Administration (EIA),” EIA, 2021, <https://www.eia.gov/tools/faqs/faq.php>.

²²⁷ EIA.

²²⁸ EIA.

²²⁹ Aldy, “Promoting Clean Energy in the American Power Sector.”

²³⁰ Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies,” 34.

emissions impacts which have been predicted by robust models of the economy and American energy system. A range of policy analysts and scholars have modeled how a potential CES would impact emissions and technology in the power sector. In 2011, a group of researchers at Resources for the Future (RFF) used an electricity market model, called the Haiku model, to predict how a CES might impact power sector emissions as well as the percentage of generation sourced by renewables. They found that a CES with a target of 57% clean generation by 2035 could achieve a 60% reduction in annual CO₂ emissions from the power sector over an implementation period of 2013-2035.²³¹ A separate report carried out by the EIA using the widely respected National Energy Modelling System (NEMS)²³² found that a CES implemented in 2015 could have reduced electricity sector CO₂ emissions 22% by 2025 and 43% by 2035.²³³ While these two estimates predict emissions reductions in the power sector for differently designed CES policies, they demonstrate that there has been some agreement that a federal CES could indeed lead to significant emissions reductions.

A 2015 report created for the Brookings Institute Climate and Energy Economics Project found that a TPS could “achieve a significant reduction in future economy-wide emissions relative to business as usual”.²³⁴ Further, the report found that the most significant change in overall electricity generation sourcing which would result from a TPS would be a major reduction in annual coal generated electricity of more than 400 terawatt-hours (TWh) by 2030.²³⁵

²³¹ Anthony Paul, Karen Palmer, and Matt Woerman, “Clean Energy Standards for Electricity: Policy Design Implications for Emissions, Supply Prices, and Regions,” RFF Discussion Paper (Resources For the Future, July 2011), 13–14, <https://media.rff.org/archive/files/sharepoint/WorkImages/Download/RFF-DP-11-35.pdf>.

²³² EIA, “Annual Energy Outlook 2021,” EIA, February 3, 2021, https://www.eia.gov/outlooks/aeo/info_nems_archive.php.

²³³ EIA, “Analysis of Impacts of a Clean Energy Standard as Requested by Chairman Bingaman” (EIA, November 2011), 6, https://www.eia.gov/analysis/requests/ces_bingaman/pdf/ces_bingaman.pdf.

²³⁴ McKibben, Morris, and Wilcoxon, “Controlling Carbon Emissions from U.S. Power Plants: How a Tradable Performance Standard Compares to a Carbon Tax,” 15–16.

²³⁵ McKibben, Morris, and Wilcoxon, 16.

Meanwhile, renewable energy generation was expected to increase across a range of technologies and only small growth of natural gas generated electricity was expected to occur.²³⁶ Achieving a successful transformation of the power sector that results in reduced emissions could depend greatly on the share of generation that is made up by natural gas. While natural gas is a lower emitting fuel than coal, there is uncertainty about the climate impact of methane leakage associated with natural gas extraction and methane leakages could counteract emissions reductions made from switching from coal generation to natural gas.²³⁷

Economic and Distributional Impacts of CES/TPS

In addition to understanding the emissions impacts of a CES, it is important that policymakers understand the economic and distributional impacts of a CES. In comparison to other policy options for emissions reductions in the power sector consisting of either an economy-wide carbon price or subsidies for renewable sources, academic literature has generally found that “carbon pricing is more cost effective than a CES, but a CES is more efficient than subsidies” in terms of achieving emissions reductions for the lowest cost.²³⁸

However, one commonly cited critique of a CES is that it could raise electricity costs for consumers.²³⁹ The current average price for electricity in the U.S. is 13.2 cents per kilowatt-hour (kWh).²⁴⁰ Since 2011, the cost of utility-scale renewable energy generation has significantly

²³⁶ McKibben, Morris, and Wilcoxon, 16.

²³⁷ Ramón A. Alvarez et al., “Greater Focus Needed on Methane Leakage from Natural Gas Infrastructure,” *Proceedings of the National Academy of Sciences* 109, no. 17 (April 24, 2012): 6435–40, <https://doi.org/10.1073/pnas.1202407109>; Xiaochun Zhang, Nathan P. Myhrvold, and Ken Caldeira, “Key Factors for Assessing Climate Benefits of Natural Gas versus Coal Electricity Generation,” *Environmental Research Letters* 9, no. 11 (November 2014): 114022, <https://doi.org/10.1088/1748-9326/9/11/114022>.

²³⁸ McKibben, Morris, and Wilcoxon, “Controlling Carbon Emissions from U.S. Power Plants: How a Tradable Performance Standard Compares to a Carbon Tax,” 7.

²³⁹ “Creating a Clean Energy Standard,” Third Way, January 11, 2011, <https://www.thirdway.org/memo/creating-a-clean-energy-standard>.

²⁴⁰ EIA, “Short-Term Energy Outlook” (EIA, March 2021), 45, <https://www.eia.gov/outlooks/steo/archives/mar21.pdf>.

declined.²⁴¹ It is possible that continued declines in costs associated with wind and solar technologies²⁴² would make any potential negative economic impacts of an ambitious CES target less severe. A recent report²⁴³ published by researchers at the University of California Berkeley’s Goldman School of Public Policy found that switching to 90% clean electricity by 2035 would not raise consumer electricity costs.²⁴⁴ In this study, clean electricity is defined as electricity generated from resources that do not contribute direct CO2 emissions, including “nuclear, hydropower, wind, solar, biomass, and fossil fuel plants with carbon capture and storage”.²⁴⁵ The report modeled a scenario requiring 90% clean electricity generation by 2035 alongside a continuation of current policies using the National Renewable Energy (NREL) Regional Energy Deployment System (ReDS) capacity-expansion model with Energy Exemplar’s PLEXOS electricity production-cost model.²⁴⁶ Researchers explained that electricity costs under the 90% clean energy scenario would likely be lower than today’s electricity costs as a result of “low renewable energy and battery costs”.²⁴⁷ However, electricity costs would still be 12% higher under the 90% clean energy case than under the continuation of new policies in 2035.²⁴⁸

While understanding how a CES would influence electricity prices nationwide is a helpful metric to evaluate to evaluate these kinds of policies, it is vital that policymakers also

²⁴¹ Lazard, “Lazard’s Levelized Cost of Energy Analysis - Version 13.0,” November 2019, 7, <https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf>.

²⁴² “Levelized Cost of Energy and Levelized Cost of Storage 2019,” Lazard.com, November 7, 2019, <http://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2019/>.

²⁴³ “The US Can Reach 90 Percent Clean Electricity by 2035, Dependably and without Increasing Consumer Bills,” UC Berkeley Goldman School of Public Policy, June 8, 2020, <https://gspp.berkeley.edu/faculty-and-impact/news/recent-news/the-us-can-reach-90-percent-clean-electricity-by-2035-dependably-and-without-increasing-consumer-bills>.

²⁴⁴ Amol Phadke et al., “2035 the Report” (Goldman School of Public Policy University of California Berkeley, June 2020), 33, <http://www.2035report.com/wp-content/uploads/2020/06/2035-Report.pdf?hsCtaTracking=8a85e9ea-4ed3-4ec0-b4c6-906934306ddb%7Cc68c2ac2-1db0-4d1c-82a1-65ef4daaf6c1>.

²⁴⁵ Phadke et al., 12.

²⁴⁶ Phadke et al., 12.

²⁴⁷ Phadke et al., 4.

²⁴⁸ Phadke et al., 5.

examine the regional and distributional impacts of a CES. Current electricity prices and power generation sources vary greatly by region, which means that a CES would impact different regions differently. An older analysis carried out in 2011 by the EIA examined the variation in future electricity prices that might occur in response to the implementation of a bill including a federal CES. Using the National Energy Modeling System (NEMS), the EIA found that in the long term, many regions would experience increases in electricity costs of 10% and that several regions could expect a CES to raise electricity prices by more than 25%.²⁴⁹ On average, the EIA predicted that long term electricity prices would increase by 21% under a federal CES compared to a baseline projection of electricity markets under the status quo.²⁵⁰

A 2014 study of the distributional and efficiency impacts of a CES in the U.S. found that electricity prices in the southeast and south central regions of the country (which includes states such as Oklahoma, Arkansas, Louisiana, Kentucky, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi) would experience the largest medium term percentage increases in electricity prices while in the long term the north central and south central regions (which included states such as North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Oklahoma, Alabama, Louisiana) of the country would experience the largest cost increases.²⁵¹ States that experienced the mildest electricity price increases included California, New York, and Florida as well as states in New England.²⁵² The imbalance in economic impacts was driven by regional variations in the electricity supply. Regions currently reliant on coal generation were generally the regions that were predicted to see the largest increases in

²⁴⁹ EIA, “Analysis of Impacts of a Clean Energy Standard as Requested by Chairman Bingaman,” 16.

²⁵⁰ EIA, 7.

²⁵¹ Sebastian Rausch and Matthew Mowers, “Distributional and Efficiency Impacts of Clean and Renewable Energy Standards for Electricity,” *Resource and Energy Economics* 36, no. 2 (2014): 579, <https://doi.org/10.1016/j.reseneeco.2013.09.001>.

²⁵² Rausch and Mowers, 579.

electricity costs.²⁵³ Furthermore, the study found that a CES for the power sector would be regressive, given that it would “place a disproportionately large burden on low-income households” who spend greater fractions of their income on electricity relative to higher income households.²⁵⁴

Although multiple studies using robust models have suggested that the long-term impacts of a CES might be experienced unevenly across geographies and income, the overall impact of a CES is important to keep in mind as well. Joe Aldy, an economist and Harvard Professor, published a report in 2011 examining the potential impacts of a federal CES. He found that in roughly two out of every three states, a federal CES would reduce electricity costs in the short-term.²⁵⁵ Further, an economy-wide analysis of a CES comparing it to carbon pricing (specifically, a cap-and-trade policy) found that CES policies could be more cost-effective depending on what was defined as “clean”.²⁵⁶ The most cost-effective CES policy design was found to correlate to a policy which granted clean energy credits to electricity suppliers using natural gas for generation. It is possible that alongside a CES or TPS policy, Congress could pursue a redistributive policy to assist communities bearing the greatest cost burden of the energy transition from dirtier to cleaner fuels.

Part IV: Current and Recent CES/TPS Proposals

The 116th Congress

²⁵³ Rausch and Mowers, 583.

²⁵⁴ Rausch and Mowers, 583.

²⁵⁵ Aldy, “Promoting Clean Energy in the American Power Sector,” 15.

²⁵⁶ Rausch and Mowers, “Distributional and Efficiency Impacts of Clean and Renewable Energy Standards for Electricity.”

In the 116th Congress, there were six bills introduced that would have implemented a federal CES, although none of them were enacted.²⁵⁷ Some of these bills defined clean energy sources solely as renewables while others included generation from sources such as nuclear, natural gas, and other sources using carbon capture and storage (CCS) as acceptable. Additionally, some proposals use a TPS as an alternate policy design where eligible clean sources of energy are defined through a standard measuring the carbon intensity of generated electricity or GHG released per unit of electricity.²⁵⁸ Four of the six bills included 100% clean energy target for the U.S. by 2050, and one bill would have required renewables to source 100% electricity by 2035.²⁵⁹ Clearly, there was significant interest in the 116th Congress in how a CES could work in the power sector. Despite this interest, none of the CES legislative proposals materialized into implemented policy given the make-up of Congress and lack of support for emissions reducing policy in the White House.

The Evergreen Action Proposal

CES proposals have very recently become a bigger part of the conversation as a potential centerpiece of future U.S. federal climate policy. A report published by two progressive think tanks, the Evergreen Collaborative²⁶⁰ and Data for Progress²⁶¹, has generated media attention for a CES policy designed to be passed in the Senate through budget reconciliation, where it would only need 51 votes.²⁶² The report is titled “A Roadmap to 100% Clean Electricity by 2035” but will hereafter be referred to as the “Evergreen Action Report”. The report was written by Leah

²⁵⁷ Lawson, “Clean Energy Standards: Selected Issues for the 117th Congress,” 1.

²⁵⁸ Lawson, 2.

²⁵⁹ Lawson, 2. (H.R. 330 Climate Solutions Act of 2019)

²⁶⁰ “Evergreen Action,” Evergreen Action, 2021, <https://www.evergreenaction.com/>.

²⁶¹ “What Is Data for Progress?,” Data For Progress, 2021, <https://www.dataforprogress.org/about>.

²⁶² Zoya Teirstein, “Biden’s Treacherous Path to 100% Clean Energy Just Got Easier,” *Grist*, February 4, 2021, <https://grist.org/politics/bidens-difficult-but-possible-path-to-100-clean-electricity-by-2035/>.

Stokes, Assistant Professor at the University of California Santa Barbara, and Sam Ricketts, an environmental policy expert and co-founder of Evergreen Action.²⁶³ The proposal includes a version of a CES that could potentially be passed through the budget reconciliation process and represents a version of the policy that progressive politicians, environmentalists, and activists known for backing the goals set forth in The Green New Deal might be more amenable to supporting.

In their report, Stokes and Ricketts envision a CES that includes a trading program for zero emissions credits (ZECs). ZECs would be earned by load serving entities (LSEs) for one megawatt-hour (MWh) of power produced eligible clean sources, which would exclude natural gas generated power that does not use carbon capture.²⁶⁴ In order to create a policy proposal that could be implementable under the current Congress, Stokes and Ricketts provide multiple versions of a CES that could pass the Senate under budget reconciliation. While budget reconciliation could present an alternative pathway to pass comprehensive climate mitigation legislation, there are specific requirements set out in the Senate's Byrd Rule which determine whether a piece of legislation is germane to the budget reconciliation process, and thus passable via this alternate legislative route.

Budget Reconciliation and The Byrd Rule

The Byrd Rule states that legislation which falls under one or more of the following definitions is considered extraneous and therefore not able to be passed through budget reconciliation.²⁶⁵

²⁶³ "The Evergreen Mission," Evergreen Action, 2021, <https://www.evergreenaction.com/mission>.

²⁶⁴ Stokes et al., "A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies," 17, 22.

²⁶⁵ Bill Heniff Jr., "The Budget Reconciliation Process: The Senate's 'Byrd Rule'" (Congressional Research Service, December 1, 2020), 5, <https://fas.org/sgp/crs/misc/RL30862.pdf>.

(the following list has been reproduced based on a report on the Byrd Rule made for the Congressional Research Service)²⁶⁶:

- it does not produce a change in outlays or revenues or a change in the terms and conditions under which outlays are made or revenues are collected
- it produces an outlay increase or revenue decrease when the instructed committee is not in compliance with its instructions
- it is outside of the jurisdiction of the committee that submitted the title or provision for inclusion in the reconciliation measure
- it produces a change in outlays or revenues which is merely incidental to the nonbudgetary components of the provision
- it would increase the deficit for a fiscal year beyond the “budget window” covered by the reconciliation measure
- it recommends changes in Social Security

A clear takeaway from examining the Byrd Rule is that a CES being passed through budget reconciliation would have to change the federal government’s revenue or expenditures, and that those changes could not be “merely incidental to the nonbudgetary components” of the bill. To account for these rules, Stokes and Ricketts present several formulations of a CES that may be viable under budget reconciliation rules for policymakers to consider. The first is described as an “‘On the Books’ ZEC System”.²⁶⁷ The system would feature ZECs similar to a clean energy credit trading system implemented in a regular CES, however “ZECs would function as cash-like assets, whose supply and distribution would be determined by the federal government”.²⁶⁸ In essence, the ‘On the Books’ ZEC System creates a CES which requires the federal government to change its inlays and outlays, and thus makes it potentially more germane to the Byrd Rule.

Under the ‘On the Books’ ZEC system, utilities would be required to obtain an increasing number of ZECs over time, and the federal government would determine how many ZECs would

²⁶⁶ Heniff Jr., 5.

²⁶⁷ Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies,” 33.

²⁶⁸ Stokes et al., 30.

be available to LSEs, thus allowing the federal government to prescribe the amount of clean electricity delivered to consumers across the entire market.²⁶⁹ ZECs could be obtained in two ways under this policy. First, an LSE delivering one megawatt-hour (MWh) of carbon free-electricity to the grid could claim a ZEC from the federal government at no added cost. Stokes and Ricketts add that each ZEC earned by an LSE in this way could be paired with a rebate which would decline over time to further incentivize early movement to carbon-free electricity generation. This also could make the proposal more germane under the Byrd Rule, given that it includes a budgetary impact and outlays from the federal government.²⁷⁰ The second method through which LSEs could choose to obtain a ZEC would be to purchase them from the federal government. This second option of compliance would function similarly to an Alternative Compliance Payment, and the cost of these ZECs would be determined on a regional basis. This option would likely be pursued by LSEs deciding it would be lower cost to purchase ZECs than to earn them through switching to clean energy. The amount of purchasable ZECs an LSE could use to demonstrate compliance would also be limited in quantity so there would be a pressure over time to switch to cleaner power generation. Purchased ZECs would create revenues for the federal government, which Stokes and Ricketts argue could be spent on clean energy deployment and “prioritizing renewable energy projects in disadvantaged communities”.²⁷¹ This method could also include a secondary market for ZECs which could allow trading of ZECs among LSEs, which might further reduce the compliance costs associated with the policy.²⁷²

²⁶⁹ Stokes et al., 30.

²⁷⁰ Stokes et al., 31.

²⁷¹ Stokes et al., 31.

²⁷² Stokes et al., 31.

The second CES policy design Stokes and Ricketts present is a “Reverse-Auction for ZECs”.²⁷³ A reverse-auction CES would charge the federal agency administering the policy with purchasing ZECs from LSEs and generators who have demonstrated compliance with clean electricity share requirements.²⁷⁴ The federal government would purchase a quantity of ZECs from LSEs necessary to meet clean electricity goals set by the CES. This would ensure that the federal government was engaged in substantial outlays (expenditures) to comply with the Byrd Rule. Each LSE would still need to demonstrate compliance with the policy by earning a prescribed number of ZECs or by paying for ACPs instead. Following the reverse-auction, LSEs covered by the CES in aggregate would be required to pay fees equivalent to the cost of the reverse-auction. Individual LSEs would pay a fee to cover the reverse-auction commensurate with its share of total retail sales of electricity by all LSEs covered under the policy.²⁷⁵

The third CES option offered in the Evergreen Action Proposal involves a so-called “Mass-Based Standard”.²⁷⁶ Under this policy framework, LSEs could earn ZECs which would correspond to emissions reductions equal to the “difference between the emissions rate (per MWh) of a clean resource and that of a conventional coal-fired power plant”.²⁷⁷ Under this version of a CES, LSEs would be given an “emissions reduction compliance trajectory” that would chart a pathway from an LSE’s baseline emissions to zero-emissions by 2035. Compliance for LSEs would be met through reducing emissions to earn the requisite amount of ZECs or purchasing ZECs. This version of the policy would include a similar role for the federal government as the previously mentioned policy frameworks, with the federal government

²⁷³ Stokes et al., 31.

²⁷⁴ Stokes et al., 31-32.

²⁷⁵ Stokes et al., 32.

²⁷⁶ Stokes et al., 32.

²⁷⁷ Stokes et al., 32.

determining the price and quantity of ZECs available to LSEs, as well as the required amount of ZECs an LSE would need to obtain for compliance.

In addition to the three main options for how policymakers could design a CES discussed so far, the Evergreen Action report offers three more legislative routes to decarbonizing the power sector which could be passed through budget reconciliation. One proposal includes a conditional block grant program, which would direct “federal investment to states conditioned upon and in support of their movement towards carbon-free power”.²⁷⁸ Second, Stokes and Ricketts present a carbon-intensity standard for electricity which could either be designed with similar elements of a CES but would be based upon “a clean-energy-percentage threshold instead of an emissions-intensity threshold”.²⁷⁹ In other words, LSEs could earn ZECs for reduced emissions rather than meeting certain thresholds for included zero-carbon generation sources or emissions intensity standards.

The proposals suggested in the Evergreen Action Report represent CES policy options that may be more politically palatable than traditional conceptions of a CES, especially in the context of budget reconciliation. However, given the recent evolution of the discussion about climate mitigation policy to include a CES as a possible centerpiece for U.S. climate policy, these ideas likely need to be fleshed out further before they are introduced as serious proposals in Congress.

The CLEAN Future Act

The discussion of what a CES could look like has already begun in the 117th Congress. On March 2nd, 2021 Democrats in the House of representatives introduced the Climate Leadership

²⁷⁸ Stokes et al., 34.

²⁷⁹ Stokes et al., 34.

and Environmental Action for our Nation’s Future Act or CLEAN Future Act (H.R. 1512).²⁸⁰

While the bill is extensive, and is nearly 1,000 pages in length, a focal point of the legislation is the inclusion of a Clean Electricity Standard.²⁸¹ The bill is titled the Climate Leadership and Environmental Action for our Nation’s Future Act or CLEAN Future Act. It is a revised version of a bill previously introduced in the 116th Congress and includes updated and more ambitious targets to reflect the increased ambition for decarbonizing the power sector expressed during President Biden’s 2020 campaign.²⁸² The H.R. 1512 CES includes a requirement that retail electricity suppliers nationwide must provide 100% clean electricity by 2035. Like the CES proposed by Evergreen Action, H.R. 1512 includes a credit trading program for Zero-Emission Electricity Credits (ZEECs). However, ZEECs are earned by power generators based on compliance with a carbon intensity standard for electricity generation.²⁸³ Starting from 2023 through 2030, ZEECs would be granted for electricity generation with a carbon intensity of 0.82 metric tons of CO₂ per megawatt-hour or lower. Starting from 2035, a more stringent carbon-intensity standard would begin and ZEECS would be granted to electricity suppliers for generation with a carbon intensity of 0.4 metric tons of CO₂ per megawatt-hour or lower. Electricity suppliers would be required to “provide an increasing percentage of clean electricity each year starting in 2023, rising to 80 percent in 2030 and 100 percent in 2035”.²⁸⁴ A notable

²⁸⁰ “H.R. 1512 To Build a Clean and Prosperous Future by Addressing the Climate Crisis, Protecting the Health and Welfare of All Americans, and Putting the Nation on the Path to a Net-Zero Greenhouse Gas Economy by 2050, and for Other Purposes.”

²⁸¹ Frank Pallone, “The CLEAN Future Act (H.R. 1512),” Pub. L. No. H.R. 1512 (2021), <https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/CFA%20Bill%20Text%202021.pdf>.

²⁸² “E&C Leaders Release Draft CLEAN Future Act Legislative Text to Achieve a 100 Percent Clean Economy,” Democrats, Energy and Commerce Committee, January 28, 2020, <https://energycommerce.house.gov/newsroom/press-releases/ec-leaders-release-draft-clean-future-act-legislative-text-to-achieve-a-100>.

²⁸³ House Committee on Energy and Commerce, “Summary of the Climate Leadership and Environmental Action for Our Nation’s (CLEAN) Future Act,” 2.

²⁸⁴ House Committee on Energy and Commerce, 2.

difference here to the Evergreen proposal is that clean electricity is defined by a carbon intensity threshold rather than zero-emissions generation. However, if enacted, H.R. 1512 would grant full credits to non-emitting generators while “GHG-emitting generators below the carbon intensity threshold” would receive partial credits.²⁸⁵

In addition to earning credits by meeting a carbon intensity threshold, generators could obtain credits through the ZEEC trading program which would allow low or zero-emitting generators to sell credits to higher emitting generators.²⁸⁶ The bill also includes an Alternative Compliance Payment (ACP) Mechanism, which would allow electricity suppliers to make payments instead of earning or buying ZEECs. The price of the ACP would increase annually and for suppliers which use ACPs for more than “10% of their compliance obligation for two consecutive calendar years” a deferral on price increases may be granted for up to five years. ACPs would be paid out to the administrating federal agency, in this case the EPA, and 25% of these revenues would be required to assist consumers with electric utility bills. The revenues generated by this program would also be used for a “Carbon Mitigation Fund” which would be spent on activities that “improve energy efficiency; promote electrification; replace fossil fuel-powered vehicles owned by state and local governments with electric or other low-carbon fuel vehicles; install fast charging electric vehicle infrastructure along urban and rural highways and public roads; or promote direct air capture and permanent sequestration or utilization of CO₂”.²⁸⁷ H.R. 1512 is likely to undergo changes as it progresses through the legislative process, however, it is an important marker for what a CES could look like which is passed in the 117th Congress.

The Biden Plan: Energy Efficiency and Clean Electricity Standard

²⁸⁵ House Committee on Energy and Commerce, 2.

²⁸⁶ House Committee on Energy and Commerce, 2.

²⁸⁷ House Committee on Energy and Commerce, 2-3.

The current policy landscape for a federal CES is still evolving and will continue to develop in the coming months. However, whether the CES proposals previously mentioned, or others gain enough steam among legislators in Washington is partially dependent on what the Biden Administration decides support. As a candidate, President Biden proposed a “technology-neutral Energy Efficiency and Clean Electricity Standard (EECES) to achieve a 100% clean power sector by 2035.”²⁸⁸ Biden’s campaign website included language that emphasized his support for scaling up “best practices from state-level clean energy standards”. The short paragraph outlining his plan to decarbonize the power sector expressed strong interests in supporting labor protections for workers and the creation of new jobs, public and private investment in a clean energy revolution, and clean energy technologies such as solar, wind, nuclear, and hydropower.²⁸⁹ The specifics of the proposals discussed in this thesis could easily be tailored to the relatively broad policy principles President Biden expressed on the campaign trail.

Part V: Political Opportunities and Challenges Associated with a CES/TPS

CES proposals have been propelled to the forefront of the U.S. domestic climate policy debate, in large part because of the perception that such a policy might be a more politically viable alternative than an economy-wide carbon price. This portion of the chapter will discuss public support for CES policies, support for and opposition to a CES among legislators, the prospects for a CES to pass through budget reconciliation, a potential regulatory simplification that could be attached to a CES, and finally how the executive branch could pursue a CES-like policy without Congress should legislative negotiations break down.

Public Support for CES/TPS Policies:

²⁸⁸ Biden, “The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future.”

²⁸⁹ Biden.

A common claim that advocates make for why lawmakers should pursue a federal CES is that the policy is relatively popular among the general public.²⁹⁰ More than 30 states have already implemented CES policies or similarly designed renewable portfolio standards.²⁹¹ This means that one in three Americans already live in places where a CES or CES-like policy has been implemented. In January 2021, the progressive think tank Data for Progress fielded a national survey of likely voters to gauge public support for a CES. The survey found that 62% of likely voters supported a 100% clean electricity grid by 2035, compared to 30% of voters who were opposed.²⁹² Additionally, 85% of Democratic voters supported this measure, compared to only 40% of Republicans. Data for Progress fielded another survey in swing states (including Minnesota, Arizona, Pennsylvania, Florida, Iowa, Nevada, North Carolina, Georgia, and Texas) during the lead-up to the 2020 election on November 4th which found that a 50% or more of likely voters supported all of these states.²⁹³ On average 11% of voters in these states expressed that they didn't know whether they supported making federal investments in achieving a 100% carbon pollution-free power grid by 2035. This suggests that any major push to implement a CES/TPS would need to reach out to these voters to convince them that such a policy was worth pursuing. An important caveat about this survey of swing voters, is that Data for Progress asked if respondents supported federal investments in a carbon pollution-free power grid. This question asks about a closely related policy option to a federal CES. However, it may be an imperfect

²⁹⁰ Leah Stokes, "This Popular and Proven Climate Policy Should Be at the Top of Congress's to-Do List," *Vox*, February 4, 2021, <https://www.vox.com/22265119/biden-climate-change-renewable-energy-clean-electricity-standard-congress>.

²⁹¹ Kelly Trumbull et al., "Progress Toward 100% Clean Energy In Cities & States Across the U.S." (UCLA Luskin Center for Innovation, November 2019), 2, <https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/100-Clean-Energy-Progress-Report-UCLA-2.pdf>.

²⁹² Danielle Deiseroth, Julian Brave NoiseCat, and Marcela Mulholland, "Voters Support 100% Clean Electricity by 2035" (Data for Progress and Evergreen Action, February 2021), 2, <https://www.filesforprogress.org/memos/voters-support-a-clean-electricity-standard.pdf>.

²⁹³ Deiseroth, NoiseCat, and Mulholland, 3.

measure of what voters think about a CES/TPS and might instead be a better indicator of the popularity of federal investments in a clean power grid.

A separate poll conducted by Climate Nexus, the Yale Program on Climate Change Communication, and the George Mason University Center for Climate Change Communication, also fielded in the fall of 2020, demonstrated strong support for decarbonizing the power sector among American voters.²⁹⁴ 72% of respondents answered that they supported “requiring electric utility companies in the United States to generate 100% of their electricity from renewable sources, like wind and solar, by the year 2035”.²⁹⁵ Such widespread support for sourcing electricity from renewable generation in national polls is somewhat unsurprising given that President Biden won election while prioritizing these policy goals and other climate action during the campaign.

The Republicans: Support and Opposition

While there has been a renewed interest in the political possibility of a CES being passed through Congress among moderate and progressive Democrats, whether a CES would be amenable to Republican legislators, particularly in the U.S. Senate, is a more complicated question. The coalition among Democrats for supporting a CES is still somewhat new and would need to grow in order to gather the requisite number of votes for a CES to pass. This makes examining any potential support for a CES among Republicans incredibly important. In 2010, Republican Senator Lindsey Graham of South Carolina introduced a bill including his own

²⁹⁴ Climate Nexus, “Poll: Voters Support Transition to 100% Clean Economy,” October 27, 2021, 1, <https://climatenexus.org/wp-content/uploads/2015/09/Public-Gas-Poll-Press-Release.pdf>.

²⁹⁵ Climate Nexus Polling, “PR2016 National Poll Toplines” (Climate Nexus, The Yale Program on Climate Change Communication, The George Mason University Center for Climate Change Communication, October 2020), 5, https://climatenexus.org/wp-content/uploads/2015/09/Public-Gas-Poll-Climate-Change.pdf?utm_campaign=Polling&utm_source=Social%20Pack&utm_content=Gas%20Poll%20Social%20Pack%20-%20Polling%20Toplines.

version of a CES. Senator Graham introduced the S. 20 (The Clean Energy Standard Act of 2010),²⁹⁶ which would have required utilities to generate 13% of their electricity from clean sources in 2013.²⁹⁷ This clean energy percentage requirement would have increased to 50% by 2050 and the policy would then have been terminated. While the plan is a rare example of a Republican legislator openly supporting a CES of any kind, Senator Graham's bill included "advanced coal generation", which is defined as coal generated electricity with capture and storage of 65% or more of greenhouse gas emissions, as a clean power source.²⁹⁸ The inclusion of coal generation as a clean power source in Senator Graham's bill could be indicative of what it would take to get Republicans on board to support a federal CES. However, at present, it seems unlikely that Democrats would be open to such a compromise. Further, it is questionable that a CES which allows continued coal generation over the long term would be able to achieve comparable emissions reductions to contemporary CES proposals which lead to significant decreases in coal generation.

Another possibility for attracting Republican support for a CES would be to include some kind of regulatory relief with the proposal. In fact, in 2012, Republican Senator Lisa Murkowski of Alaska said she would only support a CES if it replaced other federal climate regulations, such as those under the Clean Air Act which allow the EPA to regulate greenhouse gasses.²⁹⁹ In his 2010 proposal for a CES, Harvard economist Joe Aldy argued that a federal CES would

²⁹⁶ Lindsey Graham, "S.20 - 111th Congress (2009-2010): Clean Energy Standard Act of 2010" (2010), <https://www.congress.gov/bill/111th-congress/senate-bill/20/text>.

²⁹⁷ Lindsey Graham, "S. 20 To Amend the Public Utility Regulatory Policies Act of 1978 to Establish a Federal Clean Energy Standard.," Pub. L. No. S. 20 (2010), 16, <https://www.congress.gov/111/bills/s20/BILLS-111s20is.pdf>; Katie Howell, "Sen. Graham's Plan for Clean-Energy Bill Could Drain RES Support," *The New York Times*, September 29, 2010, <https://archive.nytimes.com/www.nytimes.com/gwire/2010/09/29/29greenwire-sen-grahams-plan-for-clean-energy-bill-could-d-63814.html>.

²⁹⁸ Graham, S. 20 To amend the Public Utility Regulatory Policies Act of 1978 to establish a Federal clean energy standard., 2, 6.

²⁹⁹ Andrew Restuccia, "Bingaman Launches Uphill Battle with 'clean' Power Proposal," *The Hill*, March 1, 2012, <https://thehill.com/policy/energy-environment/213585-bingaman-floats-long-awaited-clean-energy-standard>.

“eliminate the need for EPA regulations of greenhouse gas emissions in the power sector, and need for significantly duplicative state renewable mandates” and that federal CES legislation should “strike EPA greenhouse gas regulatory authority in the power sector and preempt state renewable and alternative energy portfolio standards”.³⁰⁰ This very much mirrors the argument made by CLC for including regulatory simplification in legislation for a carbon fee and dividend. Proponents of regulatory simplification argue that eliminating older regulatory regimes used by federal agencies to regulate the power sector could promote more cost-effective clean energy deployment.³⁰¹ However, it remains an open question whether Republicans would support an ambitious CES in exchange for rolling back other regulations of greenhouse gas emissions in the power sector.

Some CES proponents argue that because a CES could hide electricity price increases from consumers, it might be more palatable with Republicans than policies like a carbon tax or carbon fee.³⁰² However, current support for CES policy proposals among Republican legislators is lacking. While Republican governors at the state level in many cases have supported and implemented these types of policies, there is still a harsh reaction among many lawmakers to any federal mandates for clean energy at the federal level.³⁰³ The ranking Republican member of the House Energy and Commerce committee, Cathy McMorris Rodgers, was recently asked about her opinion of the CLEAN Future Act (H.R. 1512), which was introduced by her Democratic counterpart on the committee and is the most fleshed out version of a CES currently making its way through Congress. She remarked that the bill is a “pie-in-the-sky” federal mandate and that

³⁰⁰ Aldy, “Promoting Clean Energy in the American Power Sector,” 6.

³⁰¹ Aldy, 12.

³⁰² Abby Smith, “Carbon Taxes Are out, and Clean Electricity Standards Are In,” *Washington Examiner*, March 12, 2021, <https://www.washingtonexaminer.com/policy/clean-electricity-standard-explainer-biden-democrats>.

³⁰³ Smith.

it's "really a government takeover of electricity, of energy, of our transportation systems. I believe that is bad policy and is not going to yield the positive results for the American people."³⁰⁴ Clearly, if a CES is going to pass the 117th Congress with Republican support there is much work to be done to earn their votes. The central implication of lacking Republican support for a CES is that CES bills will probably need to be able to pass with Democratic support alone. This would require that the bill be passed through budget reconciliation, likely with all 50 Democratic Senators supporting the bill.

The Democrats: Support and Opposition:

On the other side of the political spectrum, legislators in the Democratic party have expressed a diversity of opinions on a potential CES policy. While both moderate and progressive members of the Democratic party have expressed support for different versions of a CES, whether or not a CES could be worked out to please both sides of the party is unclear. For example, moderate Democratic Senator Joe Manchin of West Virginia said about the clean energy transition, "You can't just say we're going to eliminate using all fossil and coal's going to be out, oil's going to be out, everything else, gas is going to be out of it".³⁰⁵ At the same time, when asked whether he is open to a CES, Senator Manchin said

"Oh, yeah, we are open to everything on that. The bottom line is, though, when you are doing the thing we are doing, you have to do it in a way that you don't create one vast economic depression on the price of coal because another one has opened up with opportunities. We have to make sure we are sending the opportunities to the areas that have basically carried us."³⁰⁶

³⁰⁴ Ellie Potter, "US GOP Lawmakers Introduce Alternatives to Democrats' Climate Solutions," *S&P Global Market Intelligence*, March 15, 2021, <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/us-gop-lawmakers-introduce-alternatives-to-democrats-climate-solutions-63179405>.

³⁰⁵ Potter.

³⁰⁶ Jeremy Dillon, "Q&A: Manchin on Fracking, Climate and a Clean Energy Standard," *E&E News*, January 15, 2021, <https://www.eenews.net/stories/1063722643>.

Given these statements, it appears that Senator Manchin's vote in support of a CES would be dependent on a potential proposal including coal generation as a clean generation source, programs to help communities reliant on coal power through the energy transition, or some combination of both. The CES proposals which have recently received the most media attention are designed specifically to encourage the phase out of fossil fuels such as coal and natural gas generated power, and may not in their current form meet Senator Manchin's minimum requirements to gain his support.

Meanwhile, some progressives may not be open to versions of a CES which have been customized to appeal to moderates, or even conservatives. It is hard to imagine, for example, supporters of the Green New Deal backing a plan that would maintain the presence of coal or other fossil fuels in power generation mixes much beyond 2035. This would make crafting a CES compromise which includes emissions reductions targets and power generation requirements that could keep enough conservatives, moderates, and progressives together for a bill to pass both houses of Congress extraordinarily challenging. Another area for possible disagreement over a CES is the issue of whether or not a CES bill would include regulatory simplification, limiting executive authority to regulate greenhouse gas emissions under the Clean Air Act (CAA). While some have argued regulatory simplification might be a way to get conservatives or moderates on board with an aggressive CES, progressives have seemed unwilling to put eliminating CAA authorities to regulate greenhouse gasses on the table. The Evergreen CES proposal explicitly states that "the EPA's Clean Air Act authority to regulate greenhouse gas pollution from stationary sources should remain intact under a federal CES. And, the implementation of a federal CES would not and should not in any way subtract from the important work that the EPA must do to limit traditional air pollutants from power plants, such

as through rules like Clean Air Act Mercury and Air Toxics Standards (MATS)”.³⁰⁷ The Evergreen proposal explains that it is opposed to eliminating these federal regulations in exchange for a CES because they protect communities of color and low-income communities from harmful toxic air pollution.³⁰⁸ In fact, the Evergreen Action proposal advocates that CAA regulation of power plants be pursued on top of a federal CES.³⁰⁹

Some progressives may still prefer a policy approach including a CES approach over economy wide carbon pricing. As Chairman of the House Energy and Commerce Committee and Frank Pallone author of the CLEAN Future Act said, “the votes are just not there for a price on carbon” and “[i]t’s time to try something new”.³¹⁰ Progressives would likely be more supportive of a CES designed with a narrower and less carbon-intensive definition of clean energy, and sooner targets for when the power sector should achieve a 100% clean energy goal. Other progressive priorities for a CES would be to include protections for workers and organized labor and supplementary environmental justice oriented programs to help communities which have been historically hardest hit by pollution emitted from the power sector as well as communities which may experience significant job losses due to a transition away from fossil fuels.

Chances that a CES/TPS Could Pass Through Budget Reconciliation

The recent excitement surrounding CES/TPS policies on the political left has focused on the potential viability of these policies to be tailored to pass Congress through the budget reconciliation process with a simple majority in the Senate. However, whether or not a bill including a CES/TPS is determined to be viable would be at the discretion of the Senate

³⁰⁷ Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies,” 23, 24.

³⁰⁸ Stokes et al., 24.

³⁰⁹ Stokes et al., 16.

³¹⁰ Timothy Gardner, “Democrats in U.S. House Introduce Wide-Ranging Climate Bill,” *Reuters*, March 2, 2021, <https://www.reuters.com/article/us-usa-climate-house-idUSKCN2AU2JQ>.

Parliamentarian. Although overriding the decision of the Senate Parliamentarian is an option available to the Vice President if she is backed by 50 Senators, it seems unlikely that the Biden Administration would pursue such a path. It also seems unlikely that 50 Senators would approve of overriding the judgment of the Parliamentarian.

Democrats will have the opportunity to use the budget reconciliation process only once more this fiscal year, as it was already used this year for the American Rescue Act.³¹¹ Recent reports suggest that the Democrats plan to pursue an infrastructure package with the second and final budget reconciliation process of the current fiscal year.³¹² This could make it harder to include a complicated CES/TPS policy as a center piece of a bill germane to the reconciliation process, and more likely to be viewed with scrutiny by the Senate Parliamentarian. Congressman Frank Pallone, sponsor of the CLEAN Future Act, recently expressed doubt that a CES would be germane to the Byrd Rule within the budget reconciliation process stating,

“If you have a clean electricity standard that mandates that you move by 2035 or 2050, that's authorization and that's a lot harder to justify and probably wouldn't survive under the so-called Byrd rule”³¹³

Even if a bill including a CES/TPS specifically tailored to budget reconciliation was approved by the Senate Parliamentarian, it would need to get 50 votes in the Senate which may remain challenging.

Using Executive Authority to Implement a CES/TPS and Judicial Review

³¹¹ Dylan Matthews, “This Obscure Senate Rule Might Be Donald Trump’s Best Hope for Passing His Agenda,” *Vox*, November 23, 2016, <https://www.vox.com/policy-and-politics/2016/11/23/13709518/budget-reconciliation-explained>.

³¹² Sam Mintz, “Senior Democrat ‘Hot Mic’ Says GOP Foot-Dragging Will Force Fast-Track Process for Infrastructure,” *POLITICO*, March 15, 2021, <https://www.politico.com/news/2021/03/15/ben-cardin-infrastructure-package-reconciliation-476017>. (“In conversation captured by hot mic, senior Democrat (Cardin) on the Senate committee tasked with writing surface transportation legislation says lawmakers will “most likely have to use budget reconciliation” for infrastructure bill.)

³¹³ Anthony Adragna, “Pallone Vows ‘accelerating’ Push for Ambitious Climate Action,” *Politico Pro*, January 25, 2021, <https://subscriber-politicopro-com.ezp-prod1.hul.harvard.edu/article/2021/01/25/pallone-vows-accelerating-push-for-ambitious-climate-action-1359981?>

Although a CES has been offered as a politically more viable alternative to economy-wide carbon pricing, the political challenges of passing such a policy through Congress remain apparent. Should legislative efforts to pass a CES fail, the Biden Administration could use executive authority to set up a comparable policy to aggressively reduce emissions in the power sector. Under the Obama Administration, the EPA's Clean Power Plan (CPP) came close to implementing a policy which closely resembled a TPS for the power sector using statutory authorities under the Clean Air Act (CAA). The Trump Administration later attempted to replace the CPP with its own Affordable Clean Energy Rule (ACE Rule) which would have set less stringent emissions standards for power plants.³¹⁴ Significant legal challenges made against both regulations led to the recent decision by the D.C. Court of Appeals ultimately vacating the ACE Rule, and leaving open the possibility for the Biden Administration to promulgate its own regulatory approach to setting emissions standards for power plants.³¹⁵ Ruling on whether the EPA had a mandate under the CAA to regulate greenhouse gas emissions at power plants, the D.C. Circuit clearly stated "the EPA has not just the authority, but a statutory duty, to regulate greenhouse gas pollution, including specifically from power plants".³¹⁶

The D.C. Circuit's recent ruling leaves the Biden Administration considerable flexibility to regulate the power sector. The Biden Administration could come up with its own CES or TPS for the power sector as part of a new policy to regulate power plants. Academics and policy experts have previously envisioned such a regulatory framework, so it is not out of the realm of

³¹⁴ Kate Shouse, Linda Tsang, and Jonathan Ramseur, "EPA's Affordable Clean Energy Rule: In Brief" (Congressional Research Service, n.d.), <https://fas.org/sgp/crs/misc/R46568.pdf>.

³¹⁵ David Raphael, Sandra Safro, and Cliff Rothenstein, "DC Circuit Vacates Trump's Ace Rule and Deals Biden's EPA New Hand for Regulating Power Plant Greenhouse Gas Emissions," *The National Law Review*, January 26, 2021, <https://www.natlawreview.com/article/dc-circuit-vacates-trump-s-ace-rule-and-deals-biden-s-epa-new-hand-regulating-power>.

³¹⁶ *American Lung Association v. EPA*, No. 19-1140 (D.C. Circuit January 19, 2021). ; <https://cases.justia.com/federal/appellate-courts/cadc/19-1140/19-1140-2021-01-19.pdf?ts=1611072047> 76-77.

possibility that action in the executive branch could present a temporary backup plan should legislative proceedings for a CES/TPS fall short.³¹⁷ However, while the recent D.C. Circuit ruling on the ACE Rule has created a promising opening for the Biden Administration to come up with its own power sector regulations, and perhaps a version of a CES under the CAA, it should be noted that whether such a regulatory strategy could survive over the long term is an open question.

The current ideologically conservative tilt of the Supreme Court could pose a threat to the durability of such regulations over the long term.³¹⁸ That said, every Presidential Administration dating back to Theodore Roosevelt (excluding the Trump Administration) has won a majority of its cases heard before the Supreme Court.³¹⁹ Historically, the Supreme Court has shown deference to the executive branch in cases challenging regulations by federal agencies until the two previous administrations.³²⁰ Arguably, if the Biden Administration aims to return the federal government to norms set by older administrations, this trend could return.

Part VI: Chapter Conclusion

This chapter has examined CES/TPS proposals as a possible alternative to economy-wide carbon pricing. CES/TPS policies have already been implemented at the state level to reduce greenhouse gas emissions and could offer a solid federal option to decarbonize the power sector.

³¹⁷ Dallas Burtraw, Arthur Fraas, and Nathan Richardson, “Tradable Standards for Clean Air Act Carbon Policy” (Resources For the Future, February 2012), <https://media.rff.org/archive/files/sharepoint/WorkImages/Download/RFF-DP-12-05.pdf>.

³¹⁸ Valerie Volcovici and Jessica Resnick-Ault, “U.S. Supreme Court’s Rightward Move Could Benefit Oil and Gas Interests,” *Reuters*, October 22, 2020, <https://www.reuters.com/article/usa-court-barrett-industry-idINL1N2HD15G>.

³¹⁹ Lee Epstein and Eric Posner, “Trump Has the Worst Record at the Supreme Court of Any Modern President - The Washington Post,” *The Washington Post*, July 20, 2020, <https://www.washingtonpost.com/outlook/2020/07/20/trump-has-worst-record-supreme-court-any-modern-president/>.

³²⁰ Lee Epstein and Eric A. Posner, “The Decline of Supreme Court Deference to the President,” *University of Pennsylvania Law Review* 166, no. 4 (2018): 829–60, <https://doi.org/10.2139/ssrn.2928222>.

This may allow other sectors to more easily reduce their emissions over the long term. However, a CES/TPS alone would represent an incomplete strategy to drawing down U.S. emissions. A CES/TPS would also share with an economy-wide carbon price, the potentially problematic disproportionate impacts affecting regional economies and livelihoods in coal-reliant communities. A significant consideration for policymakers regarding the design of CES/TPS policies includes determining what kinds of energy sources are defined as ‘clean’ sources, and if such definitions would include some fossil fuels. While some have argued that CES/TPS policies would be more politically palatable than an economy-wide carbon price, close examination of the positions of current members of Congress regarding these policies reveals that significant political barriers stand in their way.

Chapter 4: Conclusion and Policy Recommendations

This thesis has examined two of the major legislative options being considered in the United States which offer the potential to decarbonize the economy on a large scale. It has outlined how economy-wide carbon pricing proposals (such as a carbon fee and dividend, carbon taxes, and cap-and-trade) and policies focused on the power sector (such as a CES or TPS) function to reduce U.S. emissions and impact the economy. Further, it has considered the political obstacles facing legislative efforts to implement both sets of policy options. This chapter will compare their relative impacts and political feasibility and will offer recommendations for policymakers for a potential path forward on legislative options to mitigate greenhouse gas emissions in the U.S. in the near future.

Part I: A CES/TPS as a Way to Slow the Climate Policy Pendulum

The two major legislative pathways for climate mitigation in the U.S. currently being considered by federal lawmakers (carbon pricing and a CES/TPS) offer distinctly different sets of advantages and disadvantages. A carbon price implemented as a federal carbon fee and dividend is likely a more comprehensive emissions reduction policy in comparison to a federal CES/TPS for the power sector. Some have argued that a climate policy with a CES/TPS as a centerpiece might be able to pass through the budget reconciliation process and could be more politically palatable than a carbon price. Should proponents of CES/TPS policies be correct in this argument, a CES/TPS could be an effective legislative building block for implementation of a U.S. approach to climate mitigation policy which can outlast the ambition of a single administration.

However, it could be argued that if a CES/TPS was passed through the budget reconciliation process that it could be just as easily be repealed through the same process the next

time a majority of Senators, a majority of members of the House, and the President opposed the policy. While this argument is well taken, a CES/TPS passed through budget reconciliation would still be more durable than, say, a policy to decarbonize the power sector made by federal agencies through the CAA for two main reasons. First, budget reconciliation is a process which can only be used once for every three years. This would mean that a future coalition of legislators seeking to repeal the CES/TPS through budget reconciliation would likely have to pursue a such a repeal instead of other policy priorities, which could impose a political price if it prevented them from passing other parts of their policy agenda. Second, if a CES/TPS were approved to pass through budget reconciliation by the Senate Parliamentarian and implemented into law, it would avoid legal challenges often faced by regulations approved through executive action. A CES/TPS designed to be implemented by federal agencies under CAA authority would likely have to stand up to legal challenges in a court system which has recently conservative tilt, and which may not find arguments for expansive stator authority of the federal government under the CAA convincing. Of course, these advantages associated with a CES/TPS passed by Congress depend entirely on such a policy actually gaining enough votes to pass by a majority and being approved by the Senate Parliamentarian to pass the budget reconciliation process. Both of these scenarios are possible, but the current political landscape in Washington, as explained in Chapter 2, would suggest that healthy skepticism about whether a CES/TPS could feasibly be passed into law under the current Congress is warranted.

Part II: A CES Alone is Not a Comprehensive Long-Term Solution

Beyond the potential political advantages of a CES/TPS, it is important to examine whether including a policy that is focused on a single sector as the centerpiece of the federal government's approach to climate mitigation is advisable. There is the risk that passing a

CES/TPS bill without supplementary policies and presenting it to the public as a comprehensive pathway toward decarbonization would actually diminish the chances for political mobilization needed further down the line to enact a more far-reaching policy. It should be noted that because CES/TPS policies are meant to be focused on the power sector, they leave significant sources of emissions untouched which are associated with agriculture, residential and commercial buildings, heavy industry, and heavy transportation (including large trucks, planes, and shipping vessels which have not yet been electrified). The maximum emissions coverage of a CES/TPS for the power sector likely represents 55-80% of U.S. emissions. Therefore, should policymakers successfully pass a CES/TPS, it should be clearly communicated to the public that other policies to reduce remaining uncovered emissions will be necessary in the future.

While a CES/TPS would be a helpful tool for the federal government to incentivize decarbonization of the power sector and a rapid shift away from coal generated power, it would likely not incentivize innovation of new emissions reducing technologies. A technology neutral CES/TPS which allows utilities to comply with an emissions intensity standard could incentivize innovation of novel low emissions energy generation; however, it is likely that already existing technologies would be favored, such as natural gas, nuclear power, and renewables. A key deficiency of CES/TPS policies here is that they do not extend a signal through the rest of the economy to reduce emissions and thus do create a pressure to develop or deploy new technologies. This suggests that political and economic considerations aside, economy-wide carbon pricing would be a preferable emissions mitigation strategy.

Part III: An Aggressive Carbon Price is Likely Needed in the Long-Term But is Not Sufficient

A survey of scholarly literature modelling the predicted emissions impacts of economy-wide carbon pricing, as well as studies documenting the empirical impacts of these policies in a range of contexts, has shown that carbon pricing can contribute to significant emissions reductions. Independent models have shown that even a modest economy-wide carbon tax (starting at \$20 per ton CO₂ and increasing by 4% per year) with lump-sum rebates would reduce CO₂ emissions 17% by 2020, 30% by 2035, and 37% by 2050 compared to a baseline scenario.³²¹ Meanwhile, more ambitious estimates from reports commissioned by the CLC predict that a carbon fee and dividend such as the one proposed in the Baker-Shultz plan (with a carbon fee starting at \$43 per ton CO₂ and increasing at 5% per year) would result in a 39% emissions reduction by 2025 and 51% emissions reduction by 2035 compared to 2005 emissions levels.³²² The upper bound for estimates of the emissions reductions achievable by 2035 under the Baker-Shultz plan predict a 57% cut in U.S. emissions compared to 2005 emissions.³²³ Models anticipate that roughly two thirds of emissions reductions occurring under a revenue recycling carbon tax or carbon fee happen as a result of the power sector switching from coal generated power to natural gas and renewable generation.³²⁴

There are multiple important takeaways from the results of the models examined in this thesis. First, a carbon tax or carbon fee could contribute to substantial emissions reductions that would put the U.S. on a pathway to meet commitments made as part of the 2015 Paris

³²¹ Lawrence Goulder and Marc Hafstead, *Confronting the Climate Challenge*, *Confronting the Climate Challenge* (Columbia University Press, 2018), 90, <https://www-degruyter-com.ezp-prod1.hul.harvard.edu/document/doi/10.7312/goul17902/html>.

³²² Bailey and Bertelsen, “Exceeding Paris: How the Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO₂ Reduction By 2035,” 1.

³²³ West, “Thunder Said Energy Climate Leadership Council Analysis,” 1.

³²⁴ Goulder and Hafstead, *Confronting the Climate Challenge*, 91; West, “Thunder Said Energy Climate Leadership Council Analysis,” 2; Marilyn A. Brown and Yufei Li, “Carbon Pricing and Energy Efficiency: Pathways to Deep Decarbonization of the US Electric Sector,” *Energy Efficiency* 12, no. 2 (2019): 479, <https://doi.org/10.1007/s12053-018-9686-9>.

Agreement. Second, these emissions reductions would mostly occur in the power sector and would be facilitated by the phase out of coal and short-term phase in of natural gas generated power. Third, projections of emissions reductions resulting from a policy implementing a modest carbon price and modest carbon price accelerator will not fully decarbonize the economy by 2050 without supplementary policies. In fact, models suggest that a 2020 carbon price between \$10/ton CO₂ and \$60/ton CO₂ rising to between \$100/ton CO₂ and \$300/ton CO₂ in 2050 would result in only a 50% reduction in emissions. Meanwhile to achieve an emissions reduction of 80% compared to 2005 levels by 2050, a carbon price would have to rise to between \$200/ton CO₂ to \$500/ton CO₂.³²⁵

There are several implications of these findings. To achieve the ambitious targets for mid-century decarbonization expressed by the Biden Administration, the carbon price at the level proposed in the Baker-Shultz plan would require additional climate mitigation policies.³²⁶ For context, if the \$40/ton CO₂ starting carbon price proposed by the Baker were implemented in 2022 and rose annually by 5%, it would only be \$156.81 by 2050. While this falls among the lower end of the range of carbon prices models have projected would be required to reduce emissions by 50% it is nowhere near the range of carbon prices required to reduce emissions by 80%. Nevertheless, the emission reductions achieved by economy-wide carbon pricing have the potential to cause the phase out of coal generated power and increase the U.S. power sector's reliance on natural gas, which over the short term would result in significant emissions reductions. However, an increased reliance on natural gas for power generation would likely

³²⁵ Metcalf, "On the Economics of a Carbon Tax for the United States," 38.

³²⁶ James H. Stock, "Climate Change, Climate Policy, and Economic Growth," *NBER Macroeconomics Annual* 34, no. 1 (2020): 411, <https://doi.org/10.1086/707193>.

need to be phased out in exchange for other technologies over the long-term to meet a net-zero emissions target.

While implementing a federal carbon price would make achieving significant emissions reductions over the next two decades a more realistic goal in the U.S., it is perhaps more important to consider the global impact implementing a domestic carbon price could have. A domestic carbon price could contribute to global emissions reductions in three ways: (1) it would encourage innovation, adoption, and scaling of low-carbon technologies, (2) a carbon price with a border carbon adjustment could encourage U.S. trading partners to reduce present-day emissions, and (3) it would demonstrate a renewed U.S. commitment to reducing greenhouse gas emissions, allowing for potentially more ambitious emissions reductions targets to be set in future international climate agreements. Economy-wide carbon pricing would send a durable price signal throughout the economy which could encourage innovation of low-carbon technologies, more efficient use of current energy supplies, and perhaps incentivize reduced energy demand. In order to fully decarbonize the economy both here in the U.S. and abroad, it is likely that new technologies will need to be developed and produced at scale at competitive costs.³²⁷ The potential for a carbon price to create markets for emissions reducing technologies is an appealing element of the policy that lawmakers should consider. These technologies, once proven in the U.S., could be exported to support emissions reductions in other countries. Another advantage of a carbon pricing legislation including a border carbon adjustment is that it could use the influence of the U.S. marketplace to encourage present day emissions reductions with U.S. trading partners. Carbon prices including a border carbon adjustment would not only protect the competitiveness of companies in the U.S. with competing companies in other countries

³²⁷ Frank W. Geels et al., “Sociotechnical Transitions for Deep Decarbonization,” *Science (American Association for the Advancement of Science)* 357, no. 6357 (2017): 1242–44, <https://doi.org/10.1126/science.aao3760>.

which have not yet implemented a carbon price, but also create an incentive for trading partners to adopt aggressive emissions reductions strategies to gain better access to U.S. markets. Finally, implementing a U.S. carbon price would signal to the world that the U.S. is recommitted to reducing its own emissions and might allow other leaders in other high emitting nations to feel more comfortable adopting aggressive emissions reductions strategies.³²⁸ Signaling serious a serious commitment to climate mitigation to foreign nations would be a key advantage of carbon pricing, but this strategic goal could also be achieved through the implementation of alternative policies such as an aggressive CES/TPS policy framework which would be able to demonstrate significant domestic emissions reductions.

Part IV: The Importance of a Short-Term Climate Policy Win

Upon close examination, neither an economy-wide carbon price nor a CES/TPS would be sufficient to reduce emissions to the ambitious targets such as net-zero emissions by 2050 set by the Biden Administration. However, an argument can be made that what is necessary is a short-term policy win which will reduce emissions substantially in the near future. This could be accomplished either by an economy-wide carbon price or a CES/TPS for the power sector. Policymakers could aim to implement a CES/TPS in the short-term and then once more favorable political conditions exist, try to pass an economy-wide carbon price in the long-term.³²⁹ It is important to note that both an economy-wide carbon price and a CES/TPS could be implemented simultaneously in a complementary way, but some economists have expressed

³²⁸ Metcalf, “On the Economics of a Carbon Tax for the United States,” 4.

³²⁹ Jonas Meckling, Thomas Sterner, and Gernot Wagner, “Policy Sequencing toward Decarbonization,” *NATURE ENERGY* 2, no. 12 (2017): 918–22, <https://doi.org/10.1038/s41560-017-0025-8>.

concerns that this could increase emissions abatement costs and conflict with the efficiency of a carbon price.³³⁰

A legislative strategy which prioritizes a short-term political win may not align with pursuing a policy design that is most prudent for greenhouse gas emissions reductions. However, if successful, such a strategy could build political momentum and public trust for more comprehensive emissions mitigating policies. Political science research has demonstrated that climate policies perceived to “generate tangible public benefits” which are distributed in a fair way tend to be politically more popular.³³¹ These benefits could take the form of revenue recycling from a carbon fee or carbon tax as lump-sum rebates to all taxpayers, investments in infrastructure preparedness for frontline communities, funding to ease jobs transitions in regions negatively impacted by a carbon price, or investments in clean energy. Whichever way that policymakers tailor an emissions reduction policy to distribute benefits, “the key is that those benefits be highly salient and consistent with widely held beliefs about fair distributions of public resources”.³³² The distribution of public benefits may not only create momentum for more ambitious climate policies further down the line, but could also make whichever policies are passed in the short term more durable, and less susceptible to rollbacks should political conditions change.³³³

Part IV: Supplementing a Legislative Win with Visible Public Benefits

³³⁰Richard Schmalensee and Robert N. Stavins, “The Design of Environmental Markets: What Have We Learned from Experience with Cap and Trade?,” *Oxford Review of Economic Policy* 33, no. 4 (2017): 584, <https://doi.org/10.1093/oxrep/grx040>.

³³¹ Leigh Raymond, “Policy Perspective: Building Political Support for Carbon Pricing—Lessons from Cap-and-Trade Policies,” *Energy Policy* 134 (2019): 110986-, <https://doi.org/10.1016/j.enpol.2019.110986>.

³³² Raymond.

³³³ Raymond.

Policymaking to reduce greenhouse gas emissions during the 117th Congress will likely take shape in one of three ways. First, Congress could pass an economy wide carbon price, such as a carbon fee and dividend, through budget reconciliation. Second, Congress could pass a CES/TPS through budget reconciliation. Or, thirdly, Congress could pass neither of these legislative proposals. Regardless of which of these three scenarios ends up playing out, Congress should aim to pass supplementary legislation which may not have the same emissions reduction potential as a carbon price or CES/TPS, but which would expedite deployment of emissions-reducing technologies.

In December of 2020, as part of a \$900 billion coronavirus relief package, Congress passed a slate of climate related initiatives including a rule requiring reductions in the production and consumption of hydrofluorocarbons (HFCs), tax credit extensions for renewable energy and carbon capture projects, and \$35 billion in investments in research and development programs at the Department of Energy (DOE).³³⁴ The legislation extended Investment Tax Credits (ITCs) for solar power by two-years, Production Tax Credits (PTCs) for wind power by one year, offshore wind tax credits through 2025, and extended the 45Q CCUS income tax credit by two years until 2026.³³⁵ The \$35 billion allocation of funding to the DOE lasts five years to fund research and development of “solar and wind power, energy storage, geothermal power, marine energy, grid modernization, energy efficiency, nuclear power, and carbon capture, utilization and storage”.³³⁶

³³⁴ Sarah Kaplan and Dino Grandoni, “Stimulus Deal Includes Raft of Provisions to Fight Climate Change,” *Washington Post*, December 21, 2020, <https://www.washingtonpost.com/climate-solutions/2020/12/21/congress-climate-spending/>.

³³⁵ Jeff St. John, “Congress Passes Spending Bill With Solar, Wind Tax Credit Extensions and Energy R&D Package,” *Greentech Media*, December 22, 2020, sec. Energy, <https://www.greentechmedia.com/articles/read/solar-and-wind-tax-credit-extensions-energy-rd-package-in-spending-bill-before-congress>; Elizabeth McGinley, Don Lonczak, and Steven Lorch, “Changes to Renewable and Carbon Capture Tax Credits under the Consolidated Appropriations Act, 2021,” *The National Law Review* XI, no. 82 (January 6, 2021), <https://www.natlawreview.com/article/changes-to-renewable-and-carbon-capture-tax-credits-under-consolidated>.

³³⁶ St. John, “Congress Passes Spending Bill With Solar, Wind Tax Credit Extensions and Energy R&D Package.”

While this was the biggest climate related investments made by Congress in more than a decade, there are still other investments Congress could make to push forward deployment of clean energy and innovation of new technologies short of a carbon price or CES/TPS.

Since the introduction of the Green New Deal, many environmental advocates and progressive legislators have advocated for vast spending proposals which would stimulate the economy and job growth while promoting deployment of clean energy, energy efficiency improvements, and infrastructure upgrades. These calls for massive spending programs have continued through the COVID-19 pandemic as a way to lift up the economy. One example of a spending proposal, titled “A Green Stimulus to Rebuild our Economy: An Open Letter and Call to Action for Members of Congress” published in March 2020 called for an automatically renewed stimulus equaling 4% of GDP per year (\$850 billion) until the economy is fully decarbonized and the unemployment rate is below 3.5%.³³⁷ While proposals for federal spending on this scale directed toward green stimulus seem unlikely to pass, numerous academics and environmental leaders signed on to this letter, including President Biden’s National Climate Advisor, Gina McCarthy, and the options for public investments proposed by the letter’s authors reflect a range of public benefits which may be popular more broadly.³³⁸ Framing any major climate legislation, such as a carbon price or CES/TPS, as a policy with the potential to create tangible benefits such as new jobs, cash rebates, or new technologies has been suggested as a way to increase the public support for the policy, and durability over the long term. Policymakers hoping to enact carbon pricing legislation or a CES/TPS could consider pursuing a selection of

³³⁷ Johanna Bozuwa et al., “A Green Stimulus to Rebuild Our Economy,” Medium, March 22, 2020, https://medium.com/@green_stimulus_now/a-green-stimulus-to-rebuild-our-economy-1e7030a1d9ee.

³³⁸ Anthony Leiserowitz et al., “Politics & Global Warming, December 2020” (Yale Program on Climate Change Communication, January 14, 2021), <https://climatecommunication.yale.edu/publications/politics-global-warming-december-2020/>.

supplementary policies with tangible benefits from the list of proposed investments included in the Green Stimulus Letter to Congress, the THRIVE Agenda,³³⁹ the BUILD GREEN Act,³⁴⁰ CLEAN Future Act, or other proposals simultaneously to build a durable base of support for these policies.³⁴¹ Although these investment policies would not result in comparable greenhouse gas emissions reductions to a CES/TPS or carbon fee and dividend, they might be helpful in generating the political support needed to pass more comprehensive emission reduction policy.³⁴²

While tax credits and federal spending for clean energy and research are popular politically and easier to pass through Congress than other more comprehensive legislation, there are certainly limitations to the level of impact these policies can make toward reducing emissions.³⁴³ In 2018, the EIA simulated an extension of PTCs for utility-scale wind, geothermal, and hydroelectric generation technologies in addition to an extension of the ITC for solar power in residential, commercial, and electric power sectors both through 2050 compared to a reference case which assumed that the tax credits would expire.³⁴⁴ EIA modelling predicted that the 2050 PTC/ITC extensions would significantly increase electricity generation from renewables between 2020 through 2050 and significantly decrease electricity generation from natural gas beginning after 2030 in comparison to the reference case. However, reductions in coal generated electricity remain modest through 2050 compared to the reference case under the 2050 PTC/ITC extension.

³³⁹ “The THRIVE Agenda,” THRIVE Agenda, 2020, <https://www.thriveagenda.com/agenda>; Deb Haaland, “H. Res. 1102 Recognizing the Duty of the Federal Government to Implement an Agenda to Transform, Heal, and Renew by Investing in a Vibrant Economy (“THRIVE”)” (2020), <https://www.congress.gov/116/bills/hres/1102/BILLS-116hres1102ih.pdf>.

³⁴⁰ Elizabeth Warren et al., “The BUILD GREEN Infrastructure and Jobs Act,” March 2021, https://www.warren.senate.gov/imo/media/doc/BUILD_GREEN_Act%20Summary.pdf.

³⁴¹ “H.R. 1512 To Build a Clean and Prosperous Future by Addressing the Climate Crisis, Protecting the Health and Welfare of All Americans, and Putting the Nation on the Path to a Net-Zero Greenhouse Gas Economy by 2050, and for Other Purposes.”

³⁴² Larsen et al., “Expanding the Reach of a Carbon Tax: Emissions Impacts of Pricing Combined with Additional Climate Actions.”

³⁴³ Leiserowitz et al., “Politics & Global Warming, December 2020.”

³⁴⁴ Erin Boedecker et al., “Alternative Policies in Power Generation and Energy Demand Markets,” EIA, May 14, 2018, <https://www.eia.gov/outlooks/aeo/ppg.php>. (See figure 1)

This reveals the key limitation of federal investments in renewable electricity generation as a centerpiece of decarbonization, as significant declines in coal generated power are likely necessary for the U.S. to achieve ambitious emissions reduction targets. However, it should be noted that the EIA also modeled a scenario where the PTC and ITC were phased out earlier than in the reference case, and this resulted in significant declines in generation from renewables. This suggests that while PTC/ITC extensions should not be relied upon as a centerpiece of climate mitigation policy, they still have an important role to play in the short term to boost the transition of electricity generation toward renewable energy.

Economist Gilbert Metcalf has argued that clean energy subsidies such as the PTC and ITC can be problematic. Considering the case of PTCs which subsidize wind generation, the tax credit ends up lowering the price of energy to the end user.³⁴⁵ The problem with this, according to Metcalf, is that low energy costs can incentivize increased energy use which leads to fewer investments in energy efficiency improvements in the grid and fewer purchases of energy efficient appliances which could in the long term make it easier to reduce carbon emissions throughout the economy. A further key deficiency of renewable energy subsidies is that they have historically been extended for short periods of time. This includes the extensions of the PTC and ITC for one year and two years respectively as part of the COVID-19 relief bill passed in December 2020. If the process by which PTC and ITC extensions are renewed every one to three years for short durations continues, it seems unlikely that these policies can deliver a long-term market signal to power producers which encourages investment in cleaner electricity generation. Therefore, although these policies are popular with legislators in Washington, they lack the capacity to spur the long-term investments in clean energy and disinvestments in dirty

³⁴⁵ Metcalf, "On the Economics of a Carbon Tax for the United States," 17.

energy (such as coal generated power) needed to achieve deep decarbonization. Policymakers need to pass legislation above and beyond these types of policies if they want to make necessary to reduce U.S. emissions. Both CES/TPS policies or economy wide carbon pricing would be more optimal policies to achieve this goal.

Part VII: Policymakers Pursuing a CES/TPS or Carbon-Pricing Must Seriously Consider Distributional Impacts

It is critical that policymakers consider distributional inequities that could result either from a CES/TPS or economy wide carbon price. If passed into law, both sets of policies would result in major transformations of the power sector, disrupting jobs in coal mining and coal generation.³⁴⁶ One policy option to create a more equitable CES/TPS could include targeted investments made in clean energy projects to support coal-reliant communities.³⁴⁷ This could manifest as a sort of target renewable energy subsidy for communities whose economies depend on fossil fuel production. Senator Joe Manchin and Senator Debbie Stabenow recently introduced a bill with bipartisan support to invest \$8 billion in these kinds of communities which could assist “manufacturers and other industrial users to retool, expand, or build new facilities that make or recycle energy-related products”. Further, the bill would include “a \$4 billion carveout for use in communities where coal mines have closed or coal power plants have retired (that have not previously received the §48C tax credit)”.³⁴⁸ Policymakers should include unions

³⁴⁶ Larsen et al., “Expanding the Reach of a Carbon Tax: Emissions Impacts of Pricing Combined with Additional Climate Actions”; McKibben, Morris, and Wilcoxon, “Controlling Carbon Emissions from U.S. Power Plants: How a Tradable Performance Standard Compares to a Carbon Tax,” 20. (figures 16 and 17 illustrate expected changes in employment resulting from a TPS and carbon tax respectively.)

³⁴⁷ Stokes et al., “A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Electricity Standard and Robust Clean Energy Investments and Justice-Centered Policies,” 25.

³⁴⁸ “American Jobs in Energy Manufacturing Act of 2021,” March 2020, 1, https://www.eenews.net/assets/2021/03/01/document_gw_06.pdf; Joe Manchin, “A Bill to Amend the Internal Revenue Code of 1986 to Enhance the Qualifying Advanced Energy Project Credit” (2020), <https://www.manchin.senate.gov/imo/media/doc/AJEM%20Bill%20Text.pdf?cb&utm>.

and workers in the fossil fuel industry whose jobs may be affected by a CES/TPS as key stakeholders in facilitating new investments and programs to support them through a transition to clean energy. This will not only ensure a more equitable policy outcome, but also greater buy-in among the American public for aggressive emissions reductions. Similar investments could be made in frontline communities which stand to be the most impacted by the effects of climate change.

Alternatively, carbon pricing policies such as a carbon tax or carbon fee offer lawmakers flexibility to use generated revenues for a number of equity-oriented measures. The CLC proposal argues for an equal lump-sum payment back to all Americans for example. However, other policy designs could allocate larger dividends to those living in communities which would be hit hardest by the transition to renewable energy, such as coal-reliant communities, or those living in areas expected to be most impacted by climate change. Policymakers might instead choose to redistribute revenues from a carbon fee progressively, such that lower income households received larger rebates compared to higher income households which might alleviate concerns that rising electricity costs resulting from a carbon price would place too much of a burden on lower-earning families and individuals.³⁴⁹ Allocating revenues to direct investments in communities vulnerable to climate change and declines in employment resulting from the clean energy transition could also be another option. It should be noted that compared to the lump-sum dividend payment proposed in the Baker-Shultz plan, each of these redistributions of revenue generated by a carbon price would lead to a higher administrative cost of the program. Nevertheless, it is essential for policymakers to realize that whether they pursue a CES/TPS or an economy-wide carbon price, there should be a focus on assisting those most vulnerable to

³⁴⁹ Metcalf, "On the Economics of a Carbon Tax for the United States," 36.

climate change and those expected to experience negative employment outcomes as a direct result of these policies.

Part VIII: The Good News: Support for Comprehensive Climate Action Continues to Grow

Although the prospects of assembling a political coalition of enough lawmakers to pass an economy-wide carbon price or CES/TPS during the current Congress are grim, there are still reasons to believe that support for such policies is building and will continue to grow in the near future. Public opinion surveys have found an increasing proportion of the population not only believes in climate change, but desires sweeping federal action in response.³⁵⁰ Grassroots organizations like the Citizen's Climate Lobby have spent much of the past decade devoting valuable time and resources engaging communities all over the country to boost support for policies such as a carbon tax and dividend.³⁵¹ This work on the ground was complemented by numerous carbon pricing proposals introduced on a bipartisan basis in the 116th Congress. Further, President Biden campaigned during the 2020 election, speaking to citizens across the nation about the urgency of climate action and won the Presidency with a CES/TPS policy as a centerpiece of his policy agenda. At the time of writing, a CES as part of the CLEAN Future Act is making its way through Congress. Meanwhile, progressive groups like the Sunrise Movement have energized younger generations to make their voices heard in support of urgent climate action.³⁵² While the media often portrays youth climate activists as progressives, groups of young conservatives at the grass-roots level have recently begun advocating for climate action in the form of policies such as a carbon dividend, as well.³⁵³ It is reasonable to assume that as these

³⁵⁰ Leiserowitz et al., "Politics & Global Warming."

³⁵¹ "Citizens' Climate Lobby."

³⁵² "Sunrise Movement Election Impact," *Sunrise Movement* (blog), 2020, <https://www.sunrisemovement.org/our-election-impact/>.

³⁵³ "Young Conservatives for Carbon Dividends (YCCD) Mission Statement."

groups age, their political influence on the federal government will increase pressure on law makers to pursue sweeping policies to decarbonize the U.S. economy.

Grassroots pressures for the government to deliver on climate change have coincided with increasing commitments to decarbonization from the private sector.³⁵⁴ However, large companies in the private sector must move beyond internal goals to reduce their own emissions and commit their resources toward active lobbying on behalf climate mitigations policies. Such efforts could act as a counterweight to the very powerful corporate interests which still make it difficult to amass the political will required to pursue legislation to decarbonize the economy. Combined support for comprehensive climate mitigation policies from the grassroots, politicians, and corporate interests have the potential to make the passage of a carbon price or CES/TPS through Congress a reality in the not-so-distant future.

Part IX: The Bad News: Much Work Remains to Be Done and We Are Running Out of Time to Act

Despite the considerable progress which has been made over the last decade to gain the support of a range of constituencies across the U.S. for ambitious climate action, it must be acknowledged that significant work remains to be done before comprehensive climate policy will pass in the 117th Congress, or any Congress for that matter. This thesis has engaged in a close examination of the two central climate mitigation policy options currently being considered by lawmakers in Congress. It has shown that both a CES/TPS and carbon fee and dividend could achieve meaningful reductions of greenhouse gas emission to help the U.S. achieve international goals. However, it has found that a sector-based policy such as a CES/TPS cannot offer the same potential for emissions reductions as an economy-wide carbon price. Furthermore, it has found

³⁵⁴ “Founding Members.” (Founding members of the Climate Leadership Council include Goldman Sachs, Microsoft, ExxonMobil, Total, including many other major corporations.)

that alone, an economy-wide carbon price is unlikely to achieve an ambitious mid-century target of net-zero emissions. Despite the limitations of these two policies, this thesis has argued that passing legislation with either a carbon price or a CES/TPS would be a welcome change to the American climate policy pendulum which has swung back and forth from action to inaction.

Passing at least one of the legislative pathways to decarbonization examined in this thesis in the near future is necessary but not sufficient. Although it is possible that Democrats will maintain control of Congress and the White House following the 2022 midterm elections, the opportunity to pursue comprehensive climate legislation may not come again for some time. The last opportunity to pass comprehensive climate mitigation policy in the U.S. came and went over a decade ago with Waxman-Markey. Past experiences suggest that even despite slim chances for success, lawmakers concerned about the risks of climate change should take advantage of the current opportunity to advance the U.S. toward meaningful emissions reductions which can outlast the Biden Presidency.

The 117th Congress is at a climate crossroads. Lawmakers can choose to compromise on climate mitigation legislation, despite the limitations and imperfections of current policy proposals, or they can choose the status quo of inaction leaving U.S. climate policy to be determined by the policy pendulum of the executive branch. All the while, the U.S. is running out of time to reduce its emissions. CO₂ we emit now will remain in the atmosphere for centuries to come and the resulting impacts of climate change will be devastating for current and future generations.³⁵⁵ Should Congress opt against passing an economy-wide carbon price or a CES/TPS, it is likely that States will continue to be the main arenas for climate mitigation policy development. While state-level policies and federal low-carbon investments are crucially

³⁵⁵ David Archer et al., “Atmospheric Lifetime of Fossil Fuel Carbon Dioxide,” *Annual Review of Earth and Planetary Sciences* 37, no. 1 (2009): 131, <https://doi.org/10.1146/annurev.earth.031208.100206>.

important to securing a decarbonized future economy, a piecemeal approach to climate mitigation is unlikely to spur the types of long-term investments in new technologies that will transform the energy system. What is needed now is for Congress to take decisive action and for those outside government in the private sector and at the grassroots level to stand up to interests standing in the way of progress toward decarbonization.

Appendix 1: Economy-Wide Carbon Pricing Bills from the 116th Congress

The Energy Innovation and Carbon Dividend Act of 2019 (H.R.763) introduced by Reps. Ted Deutch (D-Fla.) and Francis Rooney (R-Fla.) on Jan. 24, 2019;

- The Healthy Climate and Family Security Act of 2019 (S.940 and H.R.1960) introduced by Sen. Chris Van Hollen (D-Md.) and Rep. Don Beyer (D-Va.) on March 28, 2019;

- The American Opportunity Carbon Fee Act of 2019 (S.1128) reintroduced by Sens. Sheldon Whitehouse (D-R.I.), Brian Schatz (D-Hawaii), Martin Heinrich (D-N.M.), and Kirsten Gillibrand (D-N.Y.) on April 10, 2019;

- The Climate Action Rebate Act of 2019 (S.2284 and H.R.4051) introduced by Sens. Chris Coons (D-Del.) and Dianne Feinstein (D-Calif.), and Rep. Jimmy Panetta (D-Calif.) on July 25, 2019;

- The Stemming Warming and Augmenting Pay Act of 2019 (H.R.4058) introduced by Reps. Francis Rooney (R-Fla.) and Dan Lipinski (D-Ill.) on July 25, 2019;

- The Raise Wages, Cut Carbon Act of 2019 Act of 2019 (H.R.3966) introduced by Reps. Dan Lipinski (D-Ill.) and Francis Rooney (R-Fla.) on July 25, 2019;

- The America Wins Act of 2019 (H.R.4142) introduced by Rep. John Larson (D-Conn.) on August 2, 2019;

- The Modernizing America with Rebuilding to Kickstart the Economy of the Twenty-first Century with a Historic Infrastructure-Centered Expansion Act of 2019 (H.R.4520) introduced by Reps. Ryan Fitzpatrick (R-Pa.) and Salud Carbajal (D-Calif.) on September 26, 2019;

- The Carbon Reduction and Tax Credit Act (H.R.5457) introduced by Rep. Sean Patrick Maloney (D-N.Y.) on December 17, 2019;

- The America's Clean Future Fund Act (S.4484) introduced by Sen. Dick Durbin (D-Ill.) on August 6, 2020 ; and

- Consumers Rebate to ban Emissions and Boost AlTernative Energy Act (H.R.8175) introduced by Rep. Jerry McNerney (D-Calif.) on September 4, 2020.

(Note)³⁵⁶

³⁵⁶ Ye, “Carbon Pricing Proposals in the 116th Congress,” 1; Hafstead, “Carbon Pricing Bill Tracker.” This list was created using these two resources.

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