

# Carbon Taxes and Economic Inequality

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## INTRODUCTION

Carbon taxation has become a central, if understated, component of a comprehensive program to address climate change. A carbon tax is a unitary tax on emissions of carbon dioxide, and potentially other greenhouse gases that warm the climate, targeted almost exclusively on the combustion of fossil fuels. While economists have universally endorsed the idea of a carbon tax,<sup>1</sup> it remains politically challenging for lawmakers to enact one.<sup>2</sup> Besides opposition from those denying the significance of climate change,<sup>3</sup> there is surprisingly tepid support from progressive groups concerned with social and economic justice, in addition to climate change.<sup>4</sup>

Progressive ambivalence about carbon taxation is both understandable and misplaced. It is understandable because carbon taxation is widely believed to be regressive.<sup>5</sup> It has become standard fare that a carbon tax increases energy costs, which make up a larger portion of a poor household's

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<sup>1</sup> See Opinion, *Economists' Statement on Carbon Dividends*, WALL ST. J. (Jan. 16, 2019, 6:55 PM), <https://www.wsj.com/articles/economists-statement-on-carbon-dividends-11547682910> [<https://perma.cc/AWD9-FL32>].

<sup>2</sup> See, e.g., Howard Gleckman, *Why Carbon Taxes Are So Hard to Pass*, FORBES (Aug. 15, 2019), <https://www.forbes.com/sites/howardgleckman/2019/08/15/why-carbon-taxes-are-so-hard-to-pass/?sh=77f61a204f05> [<https://perma.cc/NC6D-CKC3>].

<sup>3</sup> See, e.g., Brad Plumer, *The Heritage Foundation Has a Plan for Gutting the EPA and the Energy Department. It's Eerily Plausible*, VOX (Mar. 1, 2017), <https://www.vox.com/energy-and-environment/2017/3/1/14777536/heritage-budget-trump-epa-cuts> [<https://perma.cc/8HXV-VBPX>].

<sup>4</sup> See, e.g., Bill Scher, *Why Is the Left Ignoring the Bipartisan Carbon Tax Bill?*, REAL-CLEARPOLITICS (Dec. 3, 2018), [https://www.realclearpolitics.com/articles/2018/12/03/why\\_is\\_the\\_left\\_ignoring\\_the\\_bipartisan\\_carbon\\_tax\\_bill\\_138811.html#!](https://www.realclearpolitics.com/articles/2018/12/03/why_is_the_left_ignoring_the_bipartisan_carbon_tax_bill_138811.html#!) [<https://perma.cc/V2CY-YUXC>].

<sup>5</sup> See, e.g., Sarah E. West & Robertson C. Williams III, *Estimates from a Consumer Demand System: Implications for the Incidence of Environmental Taxes*, 47 J. ENVTL. ECON. & MGMT. 535, 535 (2004) ("Most studies suggest that environmental taxes tend to be at least mildly regressive, making such taxes less attractive options for policy.").

budget than a rich household's budget.<sup>6</sup> As it turns out, this perception is inaccurate: carbon taxes actually hurt fossil fuel industries, which are owned by relatively wealthy shareholders, more than they injure consumers.<sup>7</sup> Moreover, carbon tax revenues can be redistributed in such a way that overcompensates *most* poor households for increased energy costs (resulting from carbon taxation) and undercompensates *most* rich households, in which case some progress can be made toward economic equality. That said, that redistribution would be fairly modest at the carbon tax levels currently under discussion—on the order of a few hundred or a few thousand dollars per household annually.<sup>8</sup> So at best, carbon taxation can only advance modest gains toward greater equality.

At the same time, progressive ambivalence about carbon taxation is also misplaced because climate change itself is the ultimate *un*-equalizer, amplifying economic inequality to potentially apocalyptic extremes. The most important policy that can be adopted to stave off climate change, as much as possible, is a carbon tax. Without a broad price in the form of a carbon tax, it will be impossible to induce the many changes that must be made to wean humankind off fossil fuel usage. Conventional environmental laws and regulations can accomplish much, and in any case are needed to fill the gaps left by a carbon tax. But, without a policy foundation in the form of a carbon price, the necessary scale of changes will not occur. Carbon taxation is thus a critically important component for economic justice, just by virtue of being the most important policy to minimize climate change. While carbon taxation has only modest potential to *advance* economic justice, it is critical for minimizing the *backsliding* that would inevitably occur in a climate-changed future.

The case for a carbon tax for the sake of economic justice is thus compelling, if nonobvious. It is important to recognize, as some justice advocates seem to recognize or intuit, that the core goals of carbon taxation and economic justice seem to point in orthogonal directions: the preservation of human civilization and the reformation of human civilization. However, both of those goals require economic reform, and it so happens that carbon taxation is effective reform for advancing policy in both of those directions. Most importantly, reforming human civilization to achieve economic justice

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<sup>6</sup> See ADELE MORRIS & APARNA MATHUR, DISTRIBUTIONAL EFFECTS OF A CARBON TAX IN THE CONTEXT OF BROADER FISCAL REFORM, CLIMATE AND ENERGY ECONOMICS PROJECT, BROOKINGS INSTITUTION 1 (2012); Corbett A. Grainger & Charles D. Kolstad, *Who Pays a Price on Carbon?*, 46 ENVTL. & RESOURCE ECON. 359, 360 (2010) ("Our results suggest that the burden as a percent of annual income is much higher among lower income groups than higher income groups.")

<sup>7</sup> See Lawrence H. Goulder et al., *Impacts of a Carbon Tax Across US Household Income Groups: What Are the Equity-Efficiency Tradeoffs?*, 175 J. PUB. ECON. 44, 51 tbl. 3 (2019).

<sup>8</sup> On the impact of one such proposal, House Bill 763 see *infra* notes 81–82 and accompanying text; see Kevin Ummel, *Household Impact Study II* 6 figs. 3 & 4 (Citizens' Climate Lobby, Working Paper V1.1, 2020), <https://citizensclimatelobby.org/wp-content/uploads/2018/06/HIS2-Working-Paper-v1.1.pdf> [<https://perma.cc/C5W7-Q2WC>].

depends upon saving human civilization from climate change. Without that, there will be no justice for anyone at all.

## I. CARBON TAXES ARE ESSENTIAL TO MINIMIZING CLIMATE CHANGE

The likely effects of climatic changes are broad, frightening, and well-documented.<sup>9</sup> The most troubling consequence of climate change may be the exacerbation of inequality. Climate change will be costly for everyone, but it will be catastrophically costly for the poor, and probably even for the middle classes. Among nations, within countries, and even within regions, the gap between rich and poor will grow much larger; the rich will become poorer, but the poor will become *much* poorer. For the poor in the United States, an increase in the number and intensity of extremely hot days could be fatal for some who lack access to air conditioning or cool spaces.<sup>10</sup> Neighborhoods redlined in the past to the disadvantage of communities of color remain more vulnerable to extreme heat than affluent neighborhoods, even within the same part of a city.<sup>11</sup> Climate change exacerbates the effects of air pollution,<sup>12</sup> which are disproportionately endured by disadvantaged groups.<sup>13</sup> And finally, even in a technologically rich future, some work will still need to be performed outdoors. Those tasks will, as they always have, fall upon socioeconomically disadvantaged groups, but will be more dangerous in a climate-changed future.<sup>14</sup>

Inequality inflamed by climate change could be darker still. If, as models suggest, climate change constricts the supply of resources,<sup>15</sup> it is hard to imagine that they will not be hoarded by those with the means to do so.

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<sup>9</sup> For a very comprehensive review, see INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, AR5 CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY (2014).

<sup>10</sup> See U.S. GLOBAL CHANGE RESEARCH PROGRAM, IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT 544–45 (2018).

<sup>11</sup> See Brad Plumer & Nadja Popovich, *How Decades of Racist Housing Policy Left Neighborhoods Sweltering*, N.Y. TIMES (Aug. 24, 2020), <https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html> [<https://perma.cc/GQ3C-4MMG>].

<sup>12</sup> See, e.g., Andy Haines et al., *Climate Change and Human Health: Impacts, Vulnerability and Public Health*, 120 PUB. HEALTH 585, 589 (2006).

<sup>13</sup> See Diarmid Campbell-Lendrum & Carlos Corvalán, *Climate Change and Developing Country Cities: Implications for Environmental Health and Equity*, 84 J. URB. HEALTH 109, 111 (2007).

<sup>14</sup> See, e.g., Marielle Beenackers et al., *Socioeconomic Inequalities in Occupational, Leisure-Time and Transport Related Physical Activity Among European Adults: A Systematic Review*, 9 INT'L J. BEHAV. NUTRITION & PHYSICAL ACTIVITY 116, 129 (2012) (“... persons in lower socioeconomic groups did more occupational [physical activity].”).

<sup>15</sup> For a review of the resource impacts of climate change, see INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT: GLOBAL WARMING OF 1.5 °C, SUMMARY FOR POLICYMAKERS (Valérie Masson-Delmotte et al. eds., 2018) [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15\\_SPM\\_version\\_report\\_LR.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf) [<https://perma.cc/4YVX-UCZ5>].

Climate change could bring about water shortages, and while water cannot be physically hoarded, water rights *can* be bought up. In an economy riven by inequality, it is entirely conceivable that the allocation of water determined by market forces *could* result in a concentration of water rights that threatens access for disadvantaged populations. The degree of economic inequality in the United States and in the world is so great that it is entirely conceivable that wealthy households could buy up water rights in excess of immediate subsistence needs, paying prices that are well out of the reach of disadvantaged groups. Water need not be physically acquired to be hoarded; buying land with appurtenant water rights is a means of obtaining access to water that could increase the effective price of water. Harvard University, with its fifty-billion-dollar endowment,<sup>16</sup> began buying up California vineyards in 2019, with a view toward obtaining groundwater rights as a hedge against rising water prices.<sup>17</sup> It is quite plausible to imagine, if California were to suffer another prolonged drought, that fear of water scarcity could trigger a wave of Harvard-like acquisitions, and possibly remove a significant fraction of California water rights from publicly-available supply.

Water is only one example of the way climate change will stress populations. Resource shortages leading to or exacerbating poor economic conditions may cause migrations, which may be dangerous and greeted with hostility and violence. Food-growing could become more challenging in some regions, stressing food supplies and again, in a market economy, quite possibly distorting allocations to the disadvantage of poor people. With an already widening gulf between rich and poor blasted open by the prospect of chronic water shortages and other deprivations, mass unrest could be frighteningly plausible.

If economic justice means anything, it requires that climate change be arrested as much as possible. That will require many actions by many governments, but it will definitely require a carbon tax. Carbon taxation addresses economic inequality indirectly but critically, just because it is the most important policy tool to reduce greenhouse gas emissions, and the most important step in reducing the severity of impending climatic changes. To be sure, carbon taxation is a necessary, but not sufficient condition for saving human civilization from climate change. The nature of climate policy is such that many essential pieces must fall into place, but carbon taxation is the policy keystone. It is simply too difficult to make the breadth of changes in a fossil fuel economy without a price on carbon. For example, a century of fossil fuel subsidies and low fossil fuel prices have done more than distort

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<sup>16</sup> See HARVARD UNIV., FINANCIAL REPORT: FISCAL YEAR 2020, at 6 (2020), [https://finance.harvard.edu/files/fad/files/fy20\\_harvard\\_financial\\_report.pdf](https://finance.harvard.edu/files/fad/files/fy20_harvard_financial_report.pdf) [<https://perma.cc/E32H-WGMZ>].

<sup>17</sup> See Russell Gold, *Harvard Quietly Amasses California Vineyards—and the Water Underneath*, WALL ST. J. (Dec. 11, 2018), <https://www.wsj.com/articles/harvard-quietly-amasses-california-vineyardsand-the-water-underneath-1544456396> [<https://perma.cc/89QN-XXUH>].

consumer decisions; they have drawn millions of workers worldwide into fossil fuel industry jobs.<sup>18</sup> Transitioning away quickly from a fossil fuel-based economy will require a broad price signal that dampens hiring in fossil fuel industries and boosts hiring and training in alternative energy industries. Only then will individuals seek training and education in fields conducive to a low- or no-carbon economy. That will not happen without a carbon price.<sup>19</sup> All in all, the artificially low prices of fossil fuels are so ubiquitous and far-reaching that it would be extremely difficult to undertake the scale of change required without a predictable, strong, broad price signal provided by a carbon tax.

## II. CARBON TAXATION'S BAD RAP

Economists are unified in extolling the virtues of a carbon tax. A 2019 Wall Street Journal op-ed, *Economists' Statement on Carbon Dividends*, endorsed a carbon tax proposal, signed now by over 3,500 economists, including forty-five Nobel Laureates and four former chairs of the Federal Reserve.<sup>20</sup> But does anyone else agree? Carbon taxation has historically suffered from a bad reputation.<sup>21</sup>

One political problem with carbon taxation is purely aesthetic. Often, the political palatability of a policy is determined by public opinion polls, and carbon taxes poll poorly compared to alternative policies. As I have written in the past, it is problematic that public opinion polls ask superficial questions and get superficial responses, a format that biases against carbon taxation.<sup>22</sup> The way polling questions are typically asked emphasizes the “tax” aspect of a carbon tax and juxtaposes it with “investment in clean energy” or other positive-sounding things. “Tax” and “investment” are loaded with respectively negative and positive connotations that have an outsized influence in the quick-response context of a survey.<sup>23</sup>

John Podesta, the chair of Hillary Clinton's failed presidential campaign, and someone who remains influential in the Democratic Party, wrote

<sup>18</sup> In the United States alone, the energy sector, broadly speaking, employed 6.7 million Americans in 2018. See NAT'L ASS'N OF STATE ENERGY OFFICIALS & ENERGY FUTURES INITIATIVE, THE 2019 U.S. ENERGY & EMPLOYMENT REPORT 2 (2019), <https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5c7f3708fa0d6036d7120d8f/1551849054549/USEER+2019+US+Energy+Employment+Report.pdf> [<https://perma.cc/VR2M-4MJV>].

<sup>19</sup> See Shi-Ling Hsu, *Capital Transitioning: An International Human Capital Strategy for Climate Innovation*, 6 TRANSNAT'L ENVTL. L. 153, 163 (2017).

<sup>20</sup> See *Economists' Statement on Carbon Dividends*, *supra* note 1.

<sup>21</sup> See Shi-Ling Hsu et al., *Pollution Tax Heuristics: An Empirical Study of Willingness to Pay Higher Gasoline Taxes*, 36 ENERGY POL'Y 3612, 3612 (2008).

<sup>22</sup> See SHI-LING HSU, THE CASE FOR A CARBON TAX: GETTING PAST POLITICAL HANG-UPS TO EFFECTIVE CLIMATE POLICY 148–61 (2011).

<sup>23</sup> *Id.*

in 2015: “We have done extensive polling on a carbon tax. It all sucks.”<sup>24</sup> Podesta has been influential in steering climate policy in the Democratic Party, and while he and the Party have not disavowed carbon taxation, they seem to have accepted as given many illusory faults of carbon taxation.<sup>25</sup> Why does Mr. Podesta conclude that carbon tax polling “sucks”? Consider a 2019 poll conducted for the Democratic Party, which posed the alternative choices this way:<sup>26</sup>

Question A: Would you support or oppose a policy levying a new tax on carbon pollution to reduce pollution and protect the environment?

Question B: Would you support or oppose a policy providing for public investment in clean energy infrastructure and requiring carbon emissions reductions through regulation to reduce pollution and protect the environment?<sup>27</sup>

Of the subgroup responding to question A, 50% supported, 31% opposed, and 18% were unsure; of those responding to question B, support for “investment” and “regulation” was 59%, 25% opposed, and 15% were unsure. On the basis of this, the Democratic Party concluded that the public prefers “public investment in clean energy infrastructure and requiring carbon emissions reductions through regulation” over “levying a new tax on carbon.”<sup>28</sup>

What did the pollsters think respondents would say? They might as well have asked, “do you like the idea of paying more for energy?” or “would you like to see somebody else spending money and investing in clean energy?” In the few seconds that a survey respondent is given to answer a question of that nature, there is barely enough time to grasp the question, let alone reach the second-order considerations of revenue, if they even go there at all. Respondents don’t even place much weight on getting a rebate back from the tax revenues.<sup>29</sup> There is a deep discounting of the revenues of carbon taxes, and of the fiscal costs of “investment.” That is certainly *not* to say that I personally oppose the investment of the sort hypothesized; only that

<sup>24</sup> Patrick Gleason, *For First Time in Six Years A Carbon Tax Won't Be On The Ballot, But Politicians Supporting One Will*, FORBES (Sept. 29, 2020, 8:16 PM), <https://www.forbes.com/sites/patrickgleason/2020/09/29/for-first-time-in-six-years-a-carbon-tax-wont-be-on-the-ballot-but-politicians-supporting-one-will/#4340d2f41fb4> [<https://perma.cc/8HAJ-8KW6>].

<sup>25</sup> Podesta was more recently quoted as saying, “the [climate] community has largely moved into a different framework.” Amy Harder, *Joe Biden Unlikely to Push Carbon Tax as Part of Climate Change Plan*, AXIOS (Aug. 20, 2020), <https://www.axios.com/joe-biden-carbon-tax-climate-change-plan-e8d522a8-5015-45fc-8164-3ec5c8a0d8a3.html> [<https://perma.cc/N2SQ-9JNR>].

<sup>26</sup> See Memorandum from Sean McElwee, Co-Founder of Data for Progress, and John Ray, Senior Political Analyst at YouGov Blue, to Interested Parties 12–13, [https://filesforprogress.org/memos/wide\\_open\\_field.pdf](https://filesforprogress.org/memos/wide_open_field.pdf) [<https://perma.cc/M4YN-WCEC>].

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 13.

<sup>29</sup> See Soren Anderson et al., *Can Pigou at the Polls Stop Us Melting the Poles?* at 2 (Nat'l Bureau of Econ. Research, Working Paper No. 26146, 2019), [https://www.nber.org/system/files/working\\_papers/w26146/w26146.pdf](https://www.nber.org/system/files/working_papers/w26146/w26146.pdf) [<https://perma.cc/4YRZ-U5LM>].

there is a deep imbalance in the way those two options might be considered by a broader public.

For polls to provide meaningful results, they must be carefully worded to avoid biasing responses. For policies with complicated economic implications, that may require a bit more groundwork before posing a question. One NBC/Wall Street Journal poll on the Clean Power Plan,<sup>30</sup> the Obama administration's regulation to reduce emissions from power plants,<sup>31</sup> went into some depth on the views of advocates and opponents of the plan and described, in plain language, some of the less obvious effects of regulation.<sup>32</sup> While lengthy explanations and questions test the patience of survey respondents, they provide more reliable indicators of public preferences.

There are other ways in which carbon taxation gets a bad rap. Some progressives believe that carbon taxes are ineffective in reducing emissions.<sup>33</sup> The environmental activist organization Food and Water Watch declares a carbon tax to be a "fake solution" that is a "win-win for factory farms and fossil fuels" and that fails to reduce emissions.<sup>34</sup> Those claims are eerily similar to false claims made on the extreme right<sup>35</sup> and fly in the face of decades

<sup>30</sup> 80 Fed. Reg. 64662 (Oct. 23, 2015).

<sup>31</sup> For a review of the Clean Power Plan, see Gabriel Pacyniak, *Making the Most of Cooperative Federalism: What the Clean Power Plan Has Already Achieved*, 29 GEO. ENVTL. L. REV. 301 (2016).

<sup>32</sup> The question was posed after the following explanation: "Now, as you may know, President Obama has directed the Environmental Protection Agency, known as the EPA for short, to set strict carbon dioxide emission limits on existing coal-fired power plants with a goal to reduce emissions significantly by the year 2030 . . . . When it comes to the new limits on carbon dioxide emissions being set by the Obama administration and the EPA, which comes closer to your point of view? 'Supporters say action is needed because coal plants are a major source of carbon pollution. These reductions will mean cleaner air and reduce the health care costs associated with asthma and respiratory diseases by billions of dollars. Significantly lowering carbon pollution is the critical step in addressing climate change and the natural disasters and property damage it causes. These reductions will help create a new generation of clean energy and jobs.' 'Opponents say coal plant carbon emissions have already dropped over the last decade and this action will mean fewer jobs. The compliance costs for electric companies will be three times more expensive than any current EPA regulation, which means higher prices. Consumers and businesses will both end up paying more for electricity. These regulations will mean only a small change to the global climate as carbon emissions in China, India, and other developing countries will continue to rise.'" Patrick O'Connor, *Poll Shows Erosion in President's Support*, WALL ST. J. (June 18, 2014, 12:22 PM), <https://www.wsj.com/articles/poll-shows-erosion-in-presidents-support-1403064301> [<https://perma.cc/7BK6-47G7>].

<sup>33</sup> Washington State had a carbon tax ballot initiative in 2016 that was opposed by Food and Water Watch, and by a number of environmental and social justice groups, in part on the grounds that they believed that the carbon tax would not decrease emissions. See, e.g., Ben Henry, *I-732 Kowtows to Polluters, Disrespects Communities of Color*, SEATTLE GLOBALIST (Dec. 30, 2015), <https://seattleglobalist.com/2015/12/30/45907/45907> [<https://perma.cc/M46S-3DDN>]. For a review of the carbon tax ballot initiative campaign, see David Roberts, *The Left vs. a Carbon Tax*, VOX (Nov. 8, 2016, 11:00 AM), <https://www.vox.com/2016/10/18/13012394/i-732-carbon-tax-washington> [<https://perma.cc/M9RD-GLCU>].

<sup>34</sup> Jim Walsh, *The Oil Industry's Carbon Tax Dream is a Climate Nightmare*, FOOD AND WATER WATCH (Oct. 7, 2019), <https://www.foodandwaterwatch.org/news/oil-industrys-carbon-tax-dream-climate-nightmare> [<https://perma.cc/T9EN-XQW6>].

<sup>35</sup> Compare Robert P. Murphy et al., *The Case Against a U.S. Carbon Tax*, CATO INSTITUTE POLICY ANALYSIS 801 (2016) (falsely claiming, for example, that "after an initial (but temporary) drop, the [British Columbia] carbon tax has not yielded significant reductions in

of empirical economic research.<sup>36</sup> When gas prices increase, people drive less.<sup>37</sup> When electricity prices increase, people conserve electricity.<sup>38</sup> Empirical evidence from the relatively few carbon tax schemes around the world is robust: carbon taxes reduce carbon dioxide emissions.<sup>39</sup> Now, it *could* be that other factors, including economic growth, make those reductions smaller, but that does not support the argument that extreme left and extreme right organizations make: that carbon dioxide emissions are unaffected by, or even increased by, a carbon tax.

At the root of this skepticism is a skepticism that markets change behavior. Carbon taxation is a utilization of markets, and markets are strange things. Economist Maureen O'Hara once quipped that "while markets appear to work in practice, we are not sure how they work in theory."<sup>40</sup> That joke is a self-deprecating poke at her own economic profession, which always seems to have a theory for how things are supposed to work, but is often at a loss to explain the real world's many divergences from economic theory. Markets, by contrast, are difficult for economists to explain, but empirically, they work. They *always* work. In authoritarian societies, black markets are inevitable. Prohibition spawned bootlegging. Markets reflect prices which influence behavior, always, even if that influence is not obvious or not visible.

Perhaps because it is so difficult to explain, many people find it difficult to believe markets work, or perhaps find it difficult to imagine that they could actually drive profound change. Professor Alice Kaswan, a prominent environmental justice scholar, argues that carbon pricing is "essential but insufficient,"<sup>41</sup> an assessment with which I agree. A carbon price, if in the form of a carbon tax, *must* be complemented by a bevy of other policies that would address problems like fugitive emissions, emissions from a melting permafrost, emissions from land use changes, and research for a variety of technologies that will be needed for humankind to fend off apocalyptic climatic change. Moreover, trying to address climate inequality and reduce the risk to vulnerable populations will require many other policies. Professor Kaswan would, however, place the emphasis of climate policy on a variety of prescriptive government measures, regulations, and mandates. She mistrusts carbon pricing as a transformative tool, arguing that pricing is just "reducing

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gasoline purchases, and it has arguably reduced the BC economy's performance relative to the rest of Canada") with Brian Murray & Nicholas Rivers, *British Columbia's Revenue-Neutral Carbon Tax: A Review of the Latest 'Grand Experiment' in Environmental Policy*, 86 *Energy Pol'y* 674 (2015) (provides data showing Murphy's arguments are false).

<sup>36</sup> For a review, see Hsu, *supra* note 22, at 140–41 (2011).

<sup>37</sup> See West & Williams, *supra* note 5, at 547 tbl.2 (showing negative gas price elasticities for all income quintiles).

<sup>38</sup> See James A. Espey & Molly Espey, *Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities*, 36 *J. AGRIC. & APPLIED ECON.* 65, 79 (2004).

<sup>39</sup> For analyses of the effects of a carbon tax in Sweden, see Gilbert Metcalf & James H. Stock, *Measuring the Macroeconomic Impact of Carbon Taxes*, 110 *AM. ECON. ASS'N PAPERS & PROCEEDINGS* 106 (2020), and Julius J. Anderson, *Carbon Taxes and CO<sub>2</sub> Emissions: Sweden as a Case Study*, 11 *AM. ECON. J.* 1 (2019). For a review of the literature surrounding the effects of the British Columbia carbon tax, see Murray & Rivers, *supra*, note 35, at 678.

<sup>40</sup> Maureen O'Hara, *Making Market Microstructure Matter*, 28 *FIN. MGMT.* 83, 83 (1999).

<sup>41</sup> ALICE KASWAN, *CARBON PRICING: ESSENTIAL BUT INSUFFICIENT* 1 (2019).



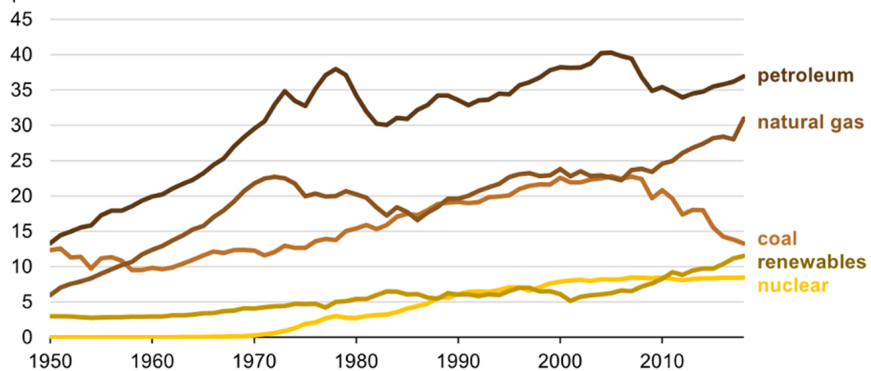
a single pollutant at the margins,” and that “market prices cannot address the systemic implications of relinquishing fossil fuels.”<sup>42</sup>

On this last point, I part ways with Professor Kaswan. What she fails to fully appreciate is that markets can and do transform entire societies, sometimes very quickly. In the case of markets for fossil fuels, prices can transform energy markets much more quickly than even an ambitious program of government mandates. For example, coal production in the United States in the past decade has fallen rapidly and continues to do so. This has not been due to government regulation. In fact, decades of regulation failed to accomplish what hydraulic fracturing has done in less than one decade, which is to supplant coal as the fossil fuel of choice for electricity generating firms. “Fracking,” as it is called, is a technology that cracks geologic formations for the purpose of extracting small deposits of natural gas (and petroleum) that would otherwise be impossible to extract profitably. Before 2007, when fracking became widespread in the United States,<sup>43</sup> coal trended upwards steadily; since then, it has fallen sharply. (See figure 1, below).

FIGURE 1<sup>44</sup>

**U.S. total energy consumption (1950-2018)**

quadrillion British thermal units



Source: U.S. Energy Information Administration

It is also worth noting that the contribution of renewable energy has increased quickly over this period, and a good part of this increase can be attributed to federal subsidies that were offered as part of government stimulus spending after the financial crisis of 2008–2009. The form of subsidies

<sup>42</sup> *Id.* at 1.

<sup>43</sup> See Thomas W. Merrill & David M. Schizer, *The Shale Oil and Gas Revolution, Hydraulic Fracturing, and Water Contamination: A Regulatory Strategy*, 98 MINN. L. REV. 145, 154 (2013).

<sup>44</sup> See U.S. ENERGY INFO. ADMIN., *In 2018, the United States Consumed More Energy Than Ever Before* (April 16, 2018), <https://www.eia.gov/todayinenergy/detail.php?id=39092#perma.cc/GGE9-NN3H>.

was varied. Some reduced the cost of investment. Some, which are ongoing, award a tax credit on electricity generated, in effect a negative tax. Government subsidies for renewable energy sources are less efficient, and are inferior in a number of ways to carbon taxation.<sup>45</sup> But, to the extent that they are more politically palatable than a tax, they represent a flawed and problematic, but second-best instrument that acts as a negative carbon tax, and as a price instrument that can help transform markets. Wind and solar companies and electricity generating firms have invested heavily over the past fifteen years, and perhaps most importantly, learned lessons about how to produce wind and solar energy more cheaply.<sup>46</sup> Facing increasing price competition from multiple sources, coal was further pushed to the margins. In 2019, for the first time since 1885, more electricity was generated by renewable energy sources than by coal.<sup>47</sup>

Of course, there is much, much more work to be done, well beyond the decline in coal usage. The next stage of decarbonization is the phasing out of fossil fuels generally, which it now appears, must take place sooner rather than later.<sup>48</sup> A carbon price must emerge soon to slow down natural gas exploration, and stall the quest for new pipelines and shipping terminals. That capacity must be replaced with renewable energy and energy storage technologies, which will require a carbon price in order to supplant natural gas as the fuel of choice for electricity generation. The economics of natural gas and renewable energy sources are different, but despite historically low gas prices,<sup>49</sup> wind and solar energy are competitive: the levelized cost of electricity for wind and solar energy<sup>50</sup> has declined rapidly, so that they are clearly lower than coal and generally (but not uniformly) lower than efficient

<sup>45</sup> See, e.g., Gilbert E. Metcalf, *Using Tax Expenditures to Achieve Energy Goals*, 98 AM. ECON. REV. 90, 94 (2008).

<sup>46</sup> See, e.g., Eric Williams et al., *Wind Power Costs Expected to Decrease Due to Technological Progress*, 106 ENERGY POL'Y 427, 433 (2017) (showing positive learning rates of 7.7 to 11%).

<sup>47</sup> See *U.S. Renewable Energy Consumption Surpasses Coal for the First Time in 130 Years*, U.S. ENERGY INFO. ADMIN., EIA.GOV (May 28, 2020), <https://www.eia.gov/todayinenergy/detail.php?id=43895#> [<https://perma.cc/N464-Y5FW>].

<sup>48</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 15, at 15 (“In 1.5°C pathways with no or limited overshoot, renewables are projected to supply 70–85% (interquartile range) of electricity in 2050 (*high confidence*). In electricity generation, shares of nuclear and fossil fuels *with carbon dioxide capture and storage* (CCS) are modelled to increase in most 1.5°C pathways with no or limited overshoot. In modelled 1.5°C pathways with limited or no overshoot, the use of CCS would allow the electricity generation share of gas to be approximately 8% (3–11% interquartile range) of global electricity in 2050, while the use of coal shows a steep reduction in all pathways and would be reduced to close to 0% . . . .” (emphasis added)).

<sup>49</sup> See, e.g., *Henry Hub Natural Gas Spot Price*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm> [<https://perma.cc/3EKR-5UBX>] (last updated Nov. 18, 2020); *Natural Gas Prices – Historical Chart*, MACROTRENDS, <https://www.macrotrends.net/2478/natural-gas-prices-historical-chart> [<https://perma.cc/WJY8-ZFD5>] (last visited Nov. 21, 2020).

<sup>50</sup> “Levelized cost” is the term used to describe the cost of a unit of energy produced, taking into account both the capital costs and the variable costs. In electricity production, it would be both the cost of fuel and the cost of constructing the power plant, spread out over the useful life of the power plant. See U.S. ENERGY INFO. ADMIN., *LEVELIZED COST OF NEW GENERATION RESOURCES IN THE ANNUAL ENERGY OUTLOOK 2020*, at 1–3 (2020), [https://www.eia.gov/outlooks/aeo/pdf/electricity\\_generation.pdf](https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf) [<https://perma.cc/7WYX-CZBG>].

combined cycle natural gas plants.<sup>51</sup> That does not necessarily translate into a cost advantage, as many considerations go into fuel choice, such as intermittency, traditionally a problem with renewable energy sources.<sup>52</sup> However, a carbon tax of \$30 per ton of CO<sub>2</sub> would add about \$5.50 to a megawatt-hour of electricity generated by natural gas, which has leveled costs in the neighborhood of \$30-40 per MWhr,<sup>53</sup> and could thus provide a decided advantage to renewable energy and energy storage technologies. That may bring about yet another transformation of the energy industry. Of course, a higher carbon tax would make that outcome a greater certainty.

While eminently reasonable in her prescription, Professor Kaswan underestimates, like many others, the power of prices and the effectiveness of carbon taxation. What is missed by many justice advocates of all kinds—economic, environmental, and climate—is that changing prices *is strong, radical policy*. For those that crave large changes soon, a carbon price will work more quickly and broadly than even a broad and ambitious set of government mandates.

### III. ARE CARBON TAXES REGRESSIVE?

Another concern with carbon taxes is the common belief that they are regressive.<sup>54</sup> That is, carbon taxation can be expected to disproportionately hurt poor households more than affluent ones because carbon taxation would increase energy prices, which account for a larger fraction of poor households' expenditures. Moreover, poor households may have less capacity for adjustment to higher energy prices.<sup>55</sup>

While nominally accurate, this perception is incomplete. Accepting as a normative matter that climate policy should insulate *most* poorer households from economic hardship (insulating *every* single poor household, however that is defined, would be impossible),<sup>56</sup> a carbon tax should not be dismissed. First, it is worth seriously reconsidering exactly how regressive carbon taxation itself is, independent of what is done with the revenues. Economic

<sup>51</sup> See U.S. ENERGY INFO. ADMIN., *supra* note 50, at 3 fig.1; *Renewable Electricity Levelized Cost of Energy Already Cheaper Than Fossil Fuels, and Prices Keep Plunging*, ENERGY INNOVATION POL'Y & TECH. LLC (Jan. 22, 2018), <https://energyinnovation.org/2018/01/22/renewable-energy-levelized-cost-of-energy-already-cheaper-than-fossil-fuels-and-prices-keep-plunging/> [https://perma.cc/4VRC-8TRD].

<sup>52</sup> See U.S. ENERGY INFO. ADMIN., *supra* note 50, at 9 (noting renewable energy technologies are intermittent and therefore “non-dispatchable” energy sources).

<sup>53</sup> U.S. ENERGY INFO. ADMIN., *supra* note 50, at 3 (figure 1, showing leveled costs of electricity for natural gas combined cycle, onshore wind, and solar photovoltaic energy).

<sup>54</sup> See MORRIS & MATHUR, *supra* note 6, at 1; Grainger & Kolstad, *supra* note 6, at 361.

<sup>55</sup> See Don A. Dillman et al., *Lifestyle and Home Energy Conservation in the United States: The Poor Accept Lifestyle Cutbacks While the Wealthy Invest in Conservation*, 3 J. ECON. PSYCH. 299, 312 (1983).

<sup>56</sup> See, e.g., Julie Anne Cronin et al., *Vertical and Horizontal Redistributions from a Carbon Tax and Rebate*, 6 J. ASS'N ENVTL. & RESOURCE ECONOMISTS S169, S170 (2019) (“Because of heterogeneity of income sources and expenditures, any package of reforms is likely to create winners and losers within each income group.”).

modeling research over the past decade suggests that carbon taxation—without considering revenue recycling—is economically painful to individuals but is more so to fossil fuel companies, energy-intensive companies, and the affluent shareholders in these corporations. Second, any regressive effects of carbon taxation can be reversed by a well-designed “recycling” of the revenues, a disbursement of carbon tax proceeds for the purpose of offsetting the economic harm from higher energy prices. Focusing on the tax itself without any consideration of the revenues is to ignore an entire half of a policy, akin to assuming that carbon taxes are collected up in a pile of cash and set on fire.<sup>57</sup> Granted, carbon tax revenues *could* be spent in a way that is regressive, which would certainly give rise to a powerful objection. But carbon tax revenues could also be used to reduce economic inequality, by recycling them in such a way that poorer households are *over*compensated for the higher energy costs stemming from carbon taxation. Ignoring those possibilities is to miss a chance to make some progress against inequality.

### A. Are Carbon Taxes Really Regressive?

That carbon taxation is regressive has become a widespread belief, seemingly based on evidence as well as an intuitive understanding that poor households spend a larger fraction of their budget on fossil fuel-intensive energy than rich households do.<sup>58</sup> That fraction may be changing.<sup>59</sup> As shown in Figure 1 above, coal combustion is rapidly being replaced in the electric utility sector by natural gas and renewable energy. As this trend continues, an increasing number of households would see a lower carbon tax bill.

But there is good reason to question whether carbon taxation is truly regressive at all. Relatively recent economic research has delved more deeply into higher-order economic effects of a carbon tax.<sup>60</sup> In addition to considering the immediate budgetary effects on households, a more sophisticated economic analysis must also consider the effect of carbon taxation on demand for fossil fuels, adjustments made by consumers and producers, the effects on intermediate industries, and the effects on shareholder income caused by a decrease in demand for fossil fuels. As it turns out, a carbon tax

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<sup>57</sup> Shi-Ling Hsu, *A Complete Analysis of Carbon Taxation: Considering the Revenue Side*, 65 *BUFF. L. REV.* 857, 870–71 (2017).

<sup>58</sup> See, e.g., Grainger & Kolstad, *supra* note 6, at 360.

<sup>59</sup> An article by Fullerton, Heutel and Metcalf estimated that in 2008, as a fraction of income, the lowest decile of income earners spent 47.4% on electricity, natural gas, fuel oil, and gasoline, and the second lowest spent 20.3%. See Don Fullerton et al., *Does Indexing of Government Transfers Make Carbon Pricing Progressive?*, 94 *AM. J. AGRIC. ECON.* 347, 349 tbl.1 (2012) (“Four types of expenditures out of 74 are categorized as dirty because they directly involve the combustion of fossil fuels: electricity, natural gas, fuel oil and other fuels, and gasoline.”). Using data from 2013, Goulder, Hafstead, Kim, and Long found that those four components totaled about 7.3% for the lowest quintile. See Goulder et al., *supra* note 7, at 51.

<sup>60</sup> See, e.g., Fullerton et al., *supra* note 59, at 347 (indexing); Goulder et al., *supra* note 7, at 56–57 (source-side impacts); Sebastian Rausch et al., *Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households*, 33 *ENERGY ECON.* S20, S20 (variation within subgroups) (2011).

that decreases the demand for fossil fuels reduces the returns to capital, which would represent losses to the high-income households that own stock.<sup>61</sup> This is especially true of investments in fossil fuel industries, such as power plants, pipelines, and refineries, which are large, expensive, and cannot be repurposed for some other use.<sup>62</sup> Fossil fuel industries could try to pass the added cost of carbon taxation onto consumers, but consumers can find ways to avoid the tax by reducing their carbon footprint. Gasoline consumers economize by driving less.<sup>63</sup> Homeowners adjust their thermostats and conserve electricity.<sup>64</sup> Fossil fuel consumers buy more efficient appliances, vehicles, and lighting.<sup>65</sup> By contrast, fossil fuel industries and fossil fuel-intensive industries tend to be heavily invested in expensive brick-and-mortar machinery, making adjustment difficult.<sup>66</sup> The price elasticity of supply and demand, the capacity of producers and consumers to change their behavior in response to changing prices, are central in determining whether producers or consumers will bear the added cost of a tax.<sup>67</sup> In the case of fossil fuels, it would appear that consumers have the upper hand.

In addition, it is worth noticing, as these researchers have, that many poor households receive government benefits that are indexed to inflation, so that an increase in energy prices (at least energy from fossil fuels) caused by a carbon tax would be largely invisible to *most* government transfer recipients.<sup>68</sup> Not all government transfers are indexed. In fact, indexing is a complicated

<sup>61</sup> See, e.g., Goulder et al., *supra* note 7, at 57 (“the carbon tax reduces after-tax returns to capital more than returns to labor. . .”).

<sup>62</sup> See Fullerton et al., *supra* note 59, at 350; Goulder et al., *supra* note 7, at 51.

<sup>63</sup> See West & Williams, *supra* note 5, at 547 tbl.2 (showing negative gas price elasticities for all income quintiles).

<sup>64</sup> See Harrison Fell et al., *A New Look at Residential Electricity Demand Using Household Expenditure Data*, 33 INT’L J. INDUS. ORG. 37, 47 (2014) (finding consistent price elasticity of demand of about -0.50, indicating a 50% drop of usage in response to a 1% increase in price).

<sup>65</sup> See, e.g., Shanjun Li et al., *Gasoline Taxes and Consumer Behavior*, 6 AM. ECON. J.: ECON. POL’Y 302, 335 tbl.11 (2014) (showing changes in miles per gallon as responses to price). Differences between short- and long-run electricity price elasticities are attributable to durable changes, such as changes in appliances. See, e.g., Jeffrey A. Dubin & Daniel L. McFadden, *An Economic Analysis of Residential Electric Appliance Holdings and Consumption*, 52 ECONOMETRICA 345, 358 tbl.6 (1984) (showing greater price elasticity of electricity demand with a portfolio shift—a change in appliances—than without).

<sup>66</sup> See Goulder et al., *supra* note 7, at 57 (“[C]apital-labor ratios of carbon intensive goods and services tend to be higher than the average ratios for the economy. Consequently the carbon tax reduces demands for capital relative to labor and lowers capital’s relative return.”).

<sup>67</sup> See, e.g., WALTER NICHOLSON, MICROECONOMIC THEORY 441 fig.15.6 (5th ed. 1992) (“The extent to which consumers or producers pay the tax depends on the price elasticities of the demand and supply curves.”); West & Williams, *supra* note 5, at 538 n.60 (“[F]or simplicity, many incidence studies (including all those cited in this section) assume that the supply of consumer goods is perfectly elastic. This implies that the imposition of a tax on a consumer good does not affect the producer price of that good, and thus that the entire burden of the tax falls on consumers. Similarly, studies commonly assume that the burden of labor taxes falls entirely on workers. Together, these two assumptions mean that there is no incidence on firms. The present paper makes both assumptions. In practice, of course, these assumptions do not hold, and thus our incidence estimates will differ somewhat from the true incidence of the tax.”).

<sup>68</sup> See Fullerton et al., *supra* note 59, at 350 (table 3, showing Social Security and Railroad Retirement income as largest category of government transfer, and showing 100% indexing).

matter, as parts of some programs are indexed and some are not. Most benefits under Social Security, Medicaid and Medicare, and the Children's Health Insurance Program, which make up about for 85% of government assistance programs<sup>69</sup> are indexed,<sup>70</sup> and therefore protect their recipients from increased energy prices. On the other hand, unemployment insurance, public assistance, and Supplemental Nutrition Assistance Program (SNAP) benefits are not indexed,<sup>71</sup> and are more likely to be more targeted at needy households, so those recipients remain vulnerable to higher energy costs caused by a carbon tax. On the whole, however, the effect of indexing of government benefits would offset increased energy prices brought on by a carbon tax for a good number of poor households.

All this is to say that a carbon tax is likely not regressive, as widely believed. It turns out that a carbon tax would impose a fair amount of economic pain on fossil fuel industries and on fossil-intensive industries, which would in turn impose a measure of economic pain on rich households that depend on investment income that, at least in part, depends upon those industries. If by "regressive" one means that the poor bear a disproportionate amount of the economic pain, it would appear to merit a more complicated discussion.

It is worth noting that carbon taxation by itself—considered without consideration of what is done with carbon tax revenues—still makes poor households worse off. It may not be much consolation to them that rich households are made even worse off. If economic justice is defined in a stronger form—that not only should economic inequality be reduced, but poor households must in general not be made worse off—then carbon taxation on its own would fail that test; imposing more pain on the rich than the poor would be insufficient.

Be that as it may, it is still worth recognizing that carbon taxation may not be regressive after all. It is worth making the case for carbon taxation on multiple normative grounds, and the recognition that carbon taxation by itself does not aggravate economic inequality is an important policy consideration.

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<sup>69</sup> For fiscal year 2019, about \$2.1 trillion were spent on Social Security, Medicare and Medicaid, and the Children's Health Insurance Program, while \$361 billion was spent on Supplemental Nutrition Assistance Program (SNAP), unemployment assistance, and other government assistance programs. See CTR. ON BUDGET AND POLICY PRIORITIES, POLICY BASICS: WHERE DO OUR FEDERAL TAX DOLLARS GO? 1-2 (2020), <https://www.cbpp.org/sites/default/files/atoms/files/4-14-08tax.pdf> [<https://perma.cc/T66F-Z54H>].

<sup>70</sup> For a review of indexing rules for government assistance programs, see DAWN NUSCHLER, CONG. RESEARCH SERV., R42000, INFLATION-INDEXING ELEMENTS IN FEDERAL ENTITLEMENT PROGRAMS (2013), <https://fas.org/sgp/crs/misc/R42000.pdf> [<https://perma.cc/Z78N-ESZ3>].

<sup>71</sup> *Id.*

### B. Revenues

Considering carbon taxation without considering what to do with the collected tax receipts is omitting analysis of an entire half of a policy. If carbon taxation were subjected to a cost-benefit analysis, ignoring the revenues is akin to considering only the costs, while zeroing out the benefits. A carbon tax of \$30 per ton would yield approximately \$150 billion in revenues in early years.<sup>72</sup> That money could go a long way towards alleviating the fiscal impacts on many households.

“Recycling” revenues, finding ways to use the carbon tax revenues in an economically productive way, is an old concept that has branched out into many different proposals. There are many plausible options. The revenues could be used to reduce corporate income taxes (on the grounds that they are distortionary), personal income taxes (also distortionary), payroll taxes such as Social Security and Medicare (distortionary and also regressive), to pay for infrastructure (in lieu of Congressional action on funding), and to simply return carbon tax proceeds to households on a lump-sum or modified per-person basis (to help households with higher energy costs).<sup>73</sup>

As a normative matter, the choice is not obvious, as there seem to be tradeoffs between the goals of reducing inequality and maximizing economic growth. Recycling the revenues by reducing corporate income taxes or taxes on capital would be the most economically growth-inducing, because those taxes are the most distortionary.<sup>74</sup> Reducing those distortionary taxes would be most effective in counteracting the growth-reducing effects of higher fossil fuel prices.<sup>75</sup> Reducing rates of corporate income taxes or capital taxes, however, has a regressive effect, because the benefits flow to those wealthy enough to own capital, or shares of corporate stock.<sup>76</sup> By contrast, rebating carbon tax revenues on a lump sum basis to all households has a progressive effect because the resulting lump-sum payment would be larger than the increase in energy costs of most poor households, and would be smaller than the increase in energy costs of most affluent households, which consume more energy.<sup>77</sup> At a carbon tax of \$30 per ton, households in the three lowest quintiles of income would, *on average*, be better off.<sup>78</sup>

<sup>72</sup> This rough approximation is based on the fact that greenhouse emissions in the United States totaled 5.41 gigatons of CO<sub>2</sub> in 2018. See *Overview of Each Country's Share of CO<sub>2</sub> Emissions*, UNION OF CONCERNED SCIENTISTS, <https://www.ucsusa.org/resources/each-country-share-co2-emissions> [<https://perma.cc/Y82L-TJPM>] (last updated Aug. 12, 2020).

<sup>73</sup> See, e.g., Hsu, *supra* note 57, at 874–80.

<sup>74</sup> “Distortionary” means that a tax is likely to alter behavior or investment patterns away from an optimum. Corporate income taxes or taxes on capital income are considered to be highly distortionary. See Goulder et al., *supra* note 7, at 54.

<sup>75</sup> Robertson C. Williams III et al., *The Initial Incidence of a Carbon Tax Across Income Groups*, 68 NAT'L TAX J. 195, 210 (2015).

<sup>76</sup> See *id.* at 197 (“Directing revenue to reduce the capital income tax has the least effect on economic well-being, but it is a regressive approach . . .”).

<sup>77</sup> See *id.* at 210.

<sup>78</sup> See *id.*

It is worth emphasizing the caveat *on average* because it is impossible to generalize about every single household in the lowest three income quintiles, or the lowest quintile, or any large group of economically disadvantaged people about which we would be concerned. Even in the lump-sum method, it is impossible to ensure that *every* household, even in the lowest income quintiles or deciles, can be insulated from energy price increases.<sup>79</sup> Some 50,000 employees in the coal industry,<sup>80</sup> for example, will have to find other employment, and a carbon tax rebate of a few hundred dollars or even a few thousand dollars will be of little help. As a carbon tax increases, that may become true of workers in the natural gas industry as well. That said, no proposed or suggested revenue recycling plan would be nearly as effective as returning carbon tax revenues directly to taxpayers, lump-sum, or on a modified per-person basis.<sup>81</sup>

It is also worth noting at this point, that where one might expect a partisan or at least an ideological divide on the question of how to use carbon tax proceeds, the economic profession seems to have unified, surprisingly and spectacularly, on a lump-sum dividend, the option that minimizes GDP growth but reduces inequality. The Wall Street Journal op-ed of 3,500 economists noted above called for a carbon tax with lump sum payments.<sup>82</sup> Among those that signed on, essentially coming down on the side of redistribution and against higher economic growth, are many prominent economists that have written about economic growth their entire illustrious careers. They include Martin Feldstein, chief economic advisor to Presidents Reagan and George H.W. Bush, Gregory Mankiw, chief economic advisor to President George W. Bush, and Robert Lucas, University of Chicago Nobel Laureate who once wrote: “Of the tendencies that are harmful to sound economics, the most seductive, and in my opinion the most poisonous, is to focus on questions of distribution.”<sup>83</sup> That such a strong and unified signal can come from such an ideologically diverse group of people is a compelling reason to favor the lump-sum revenue option.

House Bill 763,<sup>84</sup> introduced in the 116th Congress, sponsored by eighty-one House Democrats and *one* House Republican, largely adopted the economists’ proposal. House Bill 763 imposes a carbon tax and provides that the tax proceeds should be deposited into a trust fund for distribution to all U.S. households, on a modified per-person basis, with a half share for all minors in a household.<sup>85</sup> This scheme would have a redistributive effect,

<sup>79</sup> See Cronin et al., *supra* note 56, at S193.

<sup>80</sup> See NAT’L ASS’N OF STATE ENERGY OFFICIALS & ENERGY FUTURES INITIATIVE, THE 2019 U.S. ENERGY & EMPLOYMENT REPORT 4–5 (2019).

<sup>81</sup> For example, carbon tax “rebates” could be distributed to adults per household, with a fractional share to minors.

<sup>82</sup> See *Economists’ Statement on Carbon Dividends*, *supra* note 1.

<sup>83</sup> Robert E. Lucas, *The Industrial Revolution: Past and Future: 2003 Annual Report Essay*, FED. RESERVE BANK OF MINNEAPOLIS (May 1, 2004), <https://www.minneapolisfed.org/article/2004/the-industrial-revolution-past-and-future> [perma.cc/PFV6-97HU].

<sup>84</sup> H.R. 763, 116th Cong. (2019).

<sup>85</sup> See *id.* § 9512(c)(3)(B).



though a very modest one: at the starting rate of \$15 per ton, the lowest income quintile household of four (two adults and two children) would receive a “dividend” of \$514, after taxes, against an increase in energy costs of \$273; the average highest income quintile household of four would receive a post-tax dividend of \$383<sup>86</sup> against an increase in energy costs of \$921. As the carbon tax rate increases by \$10 per ton per year, those figures would increase. That bill, unfortunately, did not advance.

Beyond that, there is a live question of whether or not any carbon tax revenues should be earmarked to help workers in distressed industries. A case could be made for using carbon tax revenues to assist coal workers as the coal industry finds itself increasingly anachronistic. Alternatively, additional federal monies other than carbon tax revenues could be appropriated for this purpose. In any case, this is a very difficult ethical and political question, upon which I demur. But I do note that there is precedent for providing assistance to dislocated workers: The Trade Adjustment Assistance Program helps workers losing jobs due to international trade. Qualifying workers apply to the Department of Labor for an extension of unemployment benefits, plus help with retraining and relocation. The program has been poorly funded and controversial.<sup>87</sup> But if reducing the economic pain to workers in the fossil fuel industries is considered to be one objective of revenue recycling, the Trade Adjustment Assistance Program is at least a model for consideration.

If a carbon tax is to advance, albeit modestly, the goal of reducing inequality, recycling the revenues on a lump-sum basis is clearly the most straightforward and effective option. There is no other way to assist the maximum number of people without adopting a universal rebate policy. While there would be still some iniquities *within* income quintiles of poor Americans, no other use of carbon tax revenues would be as effective in insulating the maximum number of households against economic hardship from climate pricing. Some environmental justice advocates have proposed that money be devoted to helping low-income households cope with higher energy prices by subsidizing the installation of renewable energy sources, such as rooftop solar panels.<sup>88</sup> Some impetus for this policy lies in the fact that low- and moderate-income households are much less likely to participate in rooftop solar programs, and thus less likely to benefit from the tax subsidies accruing to rooftop solar owners.<sup>89</sup> While a laudable and intuitively

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<sup>86</sup> Dividends under H.R. 763 would be taxable, so that higher-income households would receive less of a net dividend.

<sup>87</sup> For reviews of this topic, see ADELE C. MORRIS, *BUILD A BETTER FUTURE FOR COAL WORKERS AND THEIR COMMUNITIES* (2016); Howard Rosen, *Trade Adjustment Assistance: The More We Change the More It Stays the Same*, in C. FRED BERGSTEN AND THE WORLD ECONOMY 79-113 (Michael Mussa ed., 2006).

<sup>88</sup> See GREEN JUSTICE COAL., *AN ACT RELATIVE TO SOLAR POWER IN ENVIRONMENTAL JUSTICE AND URBAN COMMUNITIES 1* (2018), <http://greenjusticecoalition.org/wp-content/uploads/2018/06/Solar-Access-1-Pager.pdf> [perma.cc/3KPL-KRV4].

<sup>89</sup> See, e.g., BENJAMIN SIGRIN & MEGHAN MOONEY, *ROOFTOP SOLAR TECHNICAL POTENTIAL FOR LAW-TO-MODERATE INCOME HOUSEHOLDS IN THE UNITED STATES 4*

appealing remedy, that would not necessarily be a good pairing with carbon taxation, as that would be an inefficient way to insulate poor households from higher energy prices. First, it would not insulate them from higher gasoline prices. But more significantly, the cost of a solar rooftop system would be much more expensive than the energy savings. Just a very rough back-of-the-envelope calculation should suffice to illustrate: a \$30 per-ton carbon tax would generate first-year revenues of \$150 billion which, if it were devoted *entirely* to buying rooftop solar systems for poor families, could only pay for about 7.5 million homes. Admittedly, this is a blunt calculation of what is always a subtler policy. But the point still remains that there are far more effective ways of protecting poor households from price increases than tapping into carbon tax revenues. If a carbon tax is to advance economic justice by reducing inequality, it is important to use that money efficiently, as inefficient uses could leave many poor households worse off.

### CONCLUSION

Carbon taxation and the advancement of economic justice do not seem to be particularly consonant goals. But in fact, carbon taxation is vital to preserving economic justice, because it is the most important tool for arresting, to the greatest extent possible, climate change. Climate change is the most brutal segregator of haves and have-nots, and unless a dramatic economic transformation takes place quickly, climate change could drive inequality to apocalyptic extremes. Moreover, a carbon tax can be designed so that the revenues are distributed on a per-household or per-person basis, which would have a modest redistributive effect, because such lump-sum payments would have the effect of overcompensating poor households and undercompensating rich households for the increased energy costs resulting from a carbon tax.

Despite almost universal approval from economists, carbon taxes remain politically challenging to enact, for three reasons. First, carbon taxes are viewed unfavorably because people superficially perceive carbon taxes as pure costs while paying only secondary attention (if any at all) to the revenue side, and the benefits that could be obtained using carbon tax revenues. This is a misapprehension that is unfortunately reinforced by public opinion polls. This negative bias contrasts starkly with alternative policies such as subsidies for renewable energy, which are less economically efficient and less effective,<sup>90</sup> but for which the costs are less salient for survey respondents, and

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(2018) (“Adoption of rooftop solar in the United States primarily has been concentrated in higher income households.”).

<sup>90</sup> See Metcalf, *supra* note 45, at 94 (“An examination of the ethanol tax credit, however, suggests that this credit is a particularly expensive policy instrument for reducing CO2 emissions. A better policy would be to replace the credit with a carbon price . . .”).

perhaps legislators.<sup>91</sup> Second, skepticism persists about the effectiveness of markets for changing behavior. And finally, concerns persist that carbon taxation is regressive, hurting poor households much more than rich households.

This essay offers a counter to these concerns, but the most important proposal to take would be to enact a carbon tax in which the revenues are returned directly to taxpaying households on a per-household or per-person basis, leading to a modestly redistributive outcome. The only way to cure misperceptions about carbon taxation may simply to institute one, and let the outcomes speak for themselves.

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<sup>91</sup> See, e.g., Wallace E. Oates, *On the Nature and Measurement of Fiscal Illusion: A Survey*, in *STUDIES IN FISCAL FEDERALISM* 65–82 (Wallace E. Oates ed., 1991) (discussing biases of legislators towards spending).

