

# Carbon Pricing: Correcting Climate Change's Market Failure

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## Abstract

*Climate change is the result of a market failure to account for the cost of greenhouse gas emissions to society, and pricing carbon is a powerful solution to correct this externality. Studies have shown that a well-designed carbon pricing program can motivate changes in energy use, reduce greenhouse gas emissions, and guard against harm to the economy or low-income families. Since 1990, carbon pricing has been implemented in over 40 national and 25 subnational jurisdictions around the world. Getting a carbon price in the United States will require building political will by mobilizing the public through grassroots activism.*

**Keywords:** advocacy; cap-and-trade; carbon pricing; carbon tax; climate change

## Introduction

Rising sea levels, more frequent and intense storms, and ocean acidification are evidence that climate change is happening around the world with devastating impacts for people and ecosystems. The heart of the climate change problem is market failure: a consequence of the price of goods not reflecting their true cost to society. When we use electricity, heat our homes, drive cars, or fly in a plane, these activities produce greenhouse gas (GHG) emissions that warm the atmosphere. But because fossil fuels are cheap and there is no cost to releasing greenhouse gas emissions, corporations have no incentive to stop using fossil fuels. This negative externality is not experienced by those who continue to cause the problem and is not reflected in the prices of the goods consumed.<sup>1</sup> The consequences of climate change—droughts, floods, air pollution, and

vector-borne diseases—are borne by the public, with a disproportionate amount of the burden falling on the most vulnerable, including children, the elderly, and low-income communities.

## Carbon Pricing

A proven method to correct this market failure is putting a price on carbon emissions. Carbon pricing works by setting a price per ton on carbon emissions (or carbon equivalents for methane and other greenhouse gases) to be paid by fossil fuel extractors or large emitters. The added price makes carbon-intensive goods and activities more expensive, while carbon-efficient goods and activities become more competitive.

Carbon pricing can be implemented as cap-and-trade or as a carbon tax. Cap-and-trade works by setting a

limit to the amount of emissions industries are allowed to emit and letting the market determine the price of emissions. Carbon tax works by setting a price on emissions and letting the market determine emissions reductions. Both mechanisms, as well as hybrid approaches, have been implemented in Europe, North America, China, and Australia. Experience has shown that all carbon pricing methods, if implemented correctly, are effective at reducing emissions, but a carbon tax is simpler to administer than cap-and-trade (it sends a steady price signal), and the revenue can be used to address social inequalities or implement complementary initiatives.<sup>2</sup>

There are many advantages of using a market-based policy to address climate change. Traditional command-and-control policies often require polluters to meet a particular standard or to take specific actions to

reduce emissions. This approach requires a high level of monitoring, with a system of fines and punishments for noncompliance. The government specifies which action to take and what technologies to use, which does not allow for flexibility or innovation. Enforcement of these regulations can be costly, and there is no incentive for polluters to go beyond compliance. A market-based approach that puts a price on emissions enables entities to reduce emissions in any way that they deem most efficient. Entities that can reduce more emissions would save money by doing so, while those that cannot would pay to pollute. Under a cap-and-trade program, a universal emissions standard is imposed, and entities can buy permits to go beyond the standard or sell permits to enable them to go under the standard. Overall, emissions reductions are achieved at the lowest cost. Beyond providing an incentive to reduce emissions, market-based policies also provide a financial incentive for inventors and investors to develop lower-emitting technologies.<sup>1</sup>

### Carbon Tax

In order for a carbon tax to be successful, consideration must be given to the price, the use of revenue, and the competition. The price must be high enough to motivate polluters to reduce emissions, and compensate society for the damages caused by climate change. According to the Interagency Working Group established under the Obama administration, the social cost of carbon will be \$45 per ton in 2020,<sup>3</sup> but many scientists say this greatly underestimates the actual cost of carbon pollution.<sup>4</sup> However, if the price is too high, then the tax will be politically difficult to support and will impose economic hardship on emitters. A tax that starts low and gradually and predictably increases would give emitters time to adjust and switch to less carbon-intensive methods. The revenue

collected can be used to lower distortionary taxes, reduce the national debt, invest in climate mitigation or adaptation measures, or be distributed to households as dividends. Because low-income households use a greater percentage of their income on energy, a carbon tax would disproportionately affect them. To address this inequity, the revenue could be used to provide refunds, or to fund programs that benefit the poor. Finally, a border adjustment fee needs to be applied so that goods imported from countries without a carbon tax would not have an unfair advantage over goods produced in countries with a carbon tax. This would also discourage companies from relocating overseas to escape the tax.

### The Economics of Carbon

Economic models show that a gradually increasing carbon tax would significantly lower greenhouse gas emissions while having no net negative impact on the economy. One of the immediate and most significant impacts of a carbon price on the electricity sector is that utilities would replace burning coal and oil with natural gas and renewables. In the long run, a carbon price would help phase out coal-fired power plants and encourage the building of power plants that run solely on renewable energy.<sup>5</sup> The Energy Information Administration (EIA) projects that a \$52 per ton carbon price would reduce electricity sector emissions by 63 percent below reference case levels by 2030.<sup>5</sup>

A carbon tax in the transportation sector is predicted to raise the cost of gasoline by about one cent per gallon for each dollar of the carbon price.<sup>5</sup> While changing the transportation sector can be difficult, over time people will switch to fuel-efficient cars and car manufacturers will make

more fuel-efficient vehicles. The EIA projects that a carbon price of \$52 per ton would reduce transportation sector emissions by 4 percent by the year 2030.<sup>5</sup> However, the EIA does not take into account improvements in fuel efficiency or the willingness of consumers to take drastic actions to reduce transportation costs. Results from other countries that have implemented a carbon price suggest that emissions reductions are likely to be greater than EIA predicts.<sup>5</sup>

In other sectors, a carbon tax could cause producers to adjust processes to reduce emissions intensity of equipment and inputs, and consumers to reduce demand for higher-carbon goods and services.<sup>5</sup> EIA estimates overall emission reductions from a carbon price that reaches \$52 per ton by 2030 to be 32 percent compared to 2005 emissions, or 28 percent compared to the reference scenario.<sup>5</sup>

One of the arguments against a carbon tax is that it would hurt the economy. Many studies have been done on this issue, and the conclusion is that a well-designed carbon tax will not have a significant adverse effect on the economy, especially if revenues are used to offset losses.<sup>2</sup> Obviously, industries such as coal mining, heavy manufacturing, and other emissions-intensive activities would be negatively impacted, but this would be offset with growth in clean energy and energy-efficiency industries. Using the revenue to reduce income taxes, improve social programs, or provide dividends to households would stimulate spending and contribute to economic growth. The positive benefits to public health through reduced air pollution and water pollution would have huge benefits for society.<sup>2</sup>

An example of a successful carbon pricing initiative is British Columbia,

which implemented a revenue neutral carbon tax starting at \$10 per ton in 2008 and increasing by \$5 per year through 2012. A fee on carbon was placed at the source, and revenue was returned to households as dividends. Over those five years, CO<sub>2</sub> emissions in British Columbia decreased from between 5 and 15 percent compared to a no-policy scenario, and fuel consumption per capita declined by 17 percent compared to the year prior to implementation, and by 19 percent compared to the rest of Canada.<sup>6</sup> These emissions reductions were achieved while the British Columbia economy kept pace with the rest of Canada and there were no signs that it negatively impacted low-income households.<sup>6,7</sup>

## Carbon Pricing Around the World

Carbon pricing has also been implemented in over 40 national and 25 subnational jurisdictions around the world.<sup>8</sup> The first adopter of a national carbon tax was Finland in 1990, followed by Norway, Sweden, and Denmark. In 2005, the European Union launched the first large-scale cap-and-trade program. This was followed by cap-and-trade programs in New Zealand, Switzerland, Kazakhstan, and Republic of Korea. National carbon taxes have also been established in recent years in France, Iceland, India, Ireland, Japan, Mexico, Switzerland, and the United Kingdom.<sup>2</sup> Canada mandated carbon pricing in all its provinces in 2017, and China began implementing municipal and provincial pilot trading systems in 2013, launching its national cap-and-trade program in December 2017.<sup>8</sup> These carbon pricing programs cover about eight gigatons of carbon dioxide equivalent (GtCO<sub>2</sub>e) or about 15 percent of global GHG emissions.<sup>8</sup> In addition,

over 1,200 companies—including more than 100 Fortune Global 500 companies—are currently using an internal price on carbon or plan to do so within the next two years.<sup>8</sup>

In the United States, national carbon pricing legislation has been introduced several times but failed to pass both houses of Congress. Notably, the Waxman-Markey Cap-and-Trade Bill passed the House of Representatives in 2009, but not the Senate. However, states are taking action to implement regional carbon pricing initiatives. The first state-level carbon pricing program was the Regional Greenhouse Gas Initiative (RGGI), launched in 2009 by 10 northeastern states. New Jersey withdrew in 2012, but New York, Delaware, Maryland, and the New England states remain in RGGI.<sup>2</sup> California launched its cap-and-trade program in 2013 linked with similar programs in Quebec and Ontario.<sup>9</sup> The program is expected to reduce greenhouse gas emissions from regulated entities by 56 percent between 2013 and 2030.<sup>9</sup>

Progress has been slow on implementing carbon pricing in the United States. To make it difficult, in July 2018, the House of Representatives voted 224–118 on a nonbinding resolution condemning a carbon tax, saying that it would hurt the U.S. economy.<sup>10</sup> President Trump then pulled the United States out of the Paris Climate Agreement, under which the United States had pledged to cut its greenhouse gas emissions 26 to 28 percent below 2005 levels by 2025 and commit up to \$3 billion in aid for poorer countries by 2020.<sup>11</sup>

## The Politics

Pricing carbon does not require advanced technology or complicated

legislation, but it does require political will. In a democracy like the United States, creating change means achieving a majority in two legislative houses with 535 voting members of Congress. The leverage point lies in getting the American public as well as key stakeholders to become vocal about this issue so that Congress feels compelled to act. With an increasing number of Americans concerned about climate change, many organizations are working together to do just that.

Since 2017, more than 2,700 leaders, including mayors, governors, municipalities, CEOs, college presidents, and cultural institutions, have signed the We Are Still In declaration, stating their intention to uphold the Paris Climate Agreement.<sup>12</sup> Since 2008, 350.org has worked with partners from around the globe on building an environmental justice movement focused on climate change.<sup>13</sup> In 2016, 350.org and 1,500 groups organized the largest climate march in history with 400,000 people in New York City, and 300,000 people in Washington, DC, in 2017, with satellite marches around the world.<sup>14</sup> Their campaigns have involved stopping the Keystone XL pipeline and other fossil fuel infrastructure projects, promoting investments in clean energy and community energy, and pressuring governments into limiting emissions.<sup>13</sup> Another group, Citizens' Climate Lobby (CCL),\* started in 2007 with a focus on organizing citizens to build political will for bipartisan climate solutions in Congress. CCL has been instrumental in building the

\*Citizens' Climate Lobby, a nonprofit grassroots advocacy organization that builds political will for carbon fee and dividend legislation. The author serves as the group's Higher Education Outreach Coordinator.

House Bipartisan Climate Solutions Caucus, a committee of equal numbers of Democrat and Republican representatives dedicated to exploring bipartisan climate solutions.<sup>15</sup>

Youth organizations are playing a key role in building political will for climate action. Our Climate, which got its start advocating for state carbon-pricing legislation in Oregon, has become a national organization empowering millennials to advocate for carbon pricing.<sup>16</sup> They are currently campaigning for state carbon pricing in Vermont; Massachusetts; Rhode Island; New York; Washington, DC; Maryland; Washington; and Oregon.<sup>17</sup> Sunrise Movement is an organization founded after the 2016 election dedicated to “make climate change an urgent priority across America, end the corrupting influence of fossil fuel executives on our politics, and elect leaders who stand up for the health and well-being of all people.”<sup>18</sup> Another organization, Zero Hour, organized a youth march on climate change in Washington, DC, on July 21, 2018, followed by lobbying and campaigning.<sup>19</sup> In addition to civic engagement, youths are also using the power of the courts. Our Children’s Trust is working with 21 plaintiffs under the age of 21 who are suing the U.S. government in an effort to “secure the legal right to a stable climate and healthy atmosphere for present and future generations.”<sup>20</sup>

## Conclusion

Since the global community has procrastinated in taking action on climate, scientists are clear that drastic and immediate actions are now needed to keep warming within a safe limit of 2 degrees Celsius.<sup>21</sup> Continuing current rates of emissions would lead to a warming of 6 to 8 degrees

Celsius, a scenario that would make vast parts of the Earth uninhabitable for humans.<sup>21</sup> Carbon pricing is the best way to correct this market failure and internalize the costs of emitting greenhouse gas emissions in our activities and in the products we use. Without carbon pricing, complementary policies such as renewable energy portfolio standards, fuel efficiency standards, and reforestation will not be as effective as they would be in concert with carbon pricing. China, Europe, and many other countries have already implemented carbon pricing; it is time for the United States to follow suit.

## Author Disclosure Statement

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