

ADVANCED REVIEW

Carbon tax ethics

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Abstract

Ideal carbon tax policy is internationally coordinated, fully internalizes externalities, redistributes revenues to those harmed, and is politically acceptable, generating predictable market signals. Since nonideal circumstances rarely allow all these conditions to be met, moral issues arise. This paper surveys some of the work in moral philosophy responding to several of these issues. First, it discusses the moral drivers for estimates of the social cost of carbon. Second, it explains how national self-interest can block climate action and suggests international policies—carbon border tax adjustments and carbon clubs—that can help address these concerns. Third, it introduces some of the social science literature about the political acceptability of carbon taxes before addressing a couple common public concerns about carbon taxes. Finally, it introduces four carbon revenue usage options, arguing that redistributive and climate compensation measures are most morally justified.

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1 | INTRODUCTION

Discussions about carbon taxes often focus on the divergence between ideal policy and actual compromises. Generally, economists tend to support carbon taxes (Climate Leadership Council, 2019; High-Level Commission on Carbon Prices, 2017), and political scientists tend to oppose them (Green, 2021; Mildenerger, 2020; Mildenerger & Stokes, 2020; Rabe, 2018; Stokes, 2020). Ideal carbon taxes would fully internalize externalities, redistribute revenues to address those harmed, and be politically acceptable, thus generating predictable market signals.

However, in the actual, nonideal world, many of these conditions have not been, or cannot be expected to, obtain. This is not to say that carbon taxes have not been introduced; they have been, in various jurisdictions, with various degrees of success. But these nonideal circumstances mean that there are special moral issues to be considered, where moral issues can be thought of as those requiring value judgments (Gardiner, 2010). For instance, carbon taxes theoretically should be calibrated to estimates of the social cost of carbon (SCC), estimates which rely on morally controversial

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assumptions. It is challenging to coordinate carbon taxes across different regional and national boundaries, due to different conceptions of national self-interest. There are doubts about the political acceptability of carbon taxes (especially in the United States, as I discuss below), and it is important to consider their feasibility throughout their full policy “life-cycle” (Mildenberger, 2020; Rabe, 2018), that is, from policy inception to legislation and subsequently protection from repeal. Finally, there is the morally multifaceted question of how to use or distribute the revenues from a carbon tax.

This article surveys and explains these issues arising from nonideal carbon tax policy. The purpose of this article is to explain how carbon tax policy in nonideal circumstances generates moral trade-offs, and to dissolve some of the dissension between proponents and opponents of carbon taxes, dissension that can come from comparing ideal and nonideal circumstances.

2 | FEATURES OF IDEAL CARBON TAX POLICY

Carbon taxes are a policy instrument that increases the cost of goods and services per unit of carbon emitted as a result of production and consumption. In principle, they are to be used to internalize the externalized costs that otherwise accrue to society (Pigou, 1932). Ideal textbook carbon taxes would correctly match the social cost of carbon, the actual cost to society of an additional, or marginal, ton of carbon (or carbon dioxide, CO₂), relative to a baseline consumption path. Estimating an SCC depends on the context; in particular, many uses of SCC in the literature are relative to current or business-as-usual consumption path. (More important for my purposes, the theoretical path relevant for Pigouvian taxes would be to an optimal consumption path where consumption is intertemporally optimized given some set of preferences.) They would be globally coordinated, so that there would be no concern about national self-interest, and globally consistent, so that there was no incentive to move manufacturing or production abroad to avoid taxes (carbon leakage). They would be predictable and politically sustainable, which would require support from stakeholders, especially the voting public. Counterintuitively, unlike most forms of tax policy, an ideal carbon tax policy would be self-limiting, since the intention is to phase down carbon usage—undercutting taxable activities over time (and lowering resulting revenue). Finally, while carbon taxes are often discussed in terms of setting the right incentives to reduce emissions, an ideal carbon tax would use the revenues to address some of the harms, either from the climate impacts or from the carbon tax itself.

Given such ideal policy, carbon taxes can be defended using different moral frameworks. Standardly, they are defended on utilitarian or consequentialist grounds (Broome, 2012; Budolfson, 2021; Eggleston, 2020). Utilitarianism holds that actions are right only if, and to the extent that, they produce the outcomes with the greatest total welfare amongst available actions. If the incentives are aligned by a carbon tax, future behaviors will predictably include less emissions; if the externalities are properly and fully internalized, rational agents will only emit carbon when the benefits are greater than the total, social costs. This will lead to optimal choices. On the revenue side, with an ideal global carbon taxing policy, resources would be diverted to globally poorer countries, increasing global distributive equality (Eggleston, 2020), or supporting access to energy for the poor (Gajevic Sayegh, 2019).

However, carbon taxes can also be defended on contractualist grounds. Contractualism holds that actions are right when they are rationally acceptable to all involved, or, in the current context, that we should act according to our obligations to others in order to secure mutual advantage on the basis of (hypothetical) contracts. On these grounds, Heath (2021) argues that carbon taxes, by internalizing the climate externalities, are sufficient for a morally justifiable climate policy. In other words, once the social costs of emissions are internalized, members of society have discharged their obligations to other members, “ensuring that no one is taking advantage of anyone else by overconsuming” relative to the emissions’ benefits (155). In other words, Heath believes that carbon taxes make sure that you contribute to the market and society in (rough) proportion to what you remove through consumption.

There are relatively few other deontological approaches used to defend carbon taxes, although Gajevic Sayegh (2019) defends carbon pricing by suggesting that it can simultaneously respect the duty not to harm while defending a right to energy (drawing on Caney, 2010 and Shue, 2014). Members of society are incentivized to avoid harming others (which is what a carbon tax does), and the revenues from that carbon tax can be used to help ensure equitable access to energy.

When defending carbon taxes against command and control legislation, proponents often have ideal policy in mind. They may point out that, with ideal policy, carbon prices have consistent and systematic effects across society, as opposed to focusing on particular sectors or particular targets (Heath, 2021, p. 168). They may indicate that, unlike with voluntary actions like offsetting (Hyams & Fawcett, 2013), carbon taxes do not depend on moral or altruistic

motivations (Baranzini et al., 2017). They may point out that climate change may involve the largest externalities ever seen, making it especially important to correct (Stern, 2007, p. xviii). They might even suggest that, since carbon taxes in ideal policy involve few choices (predominantly which level to set the tax), carbon taxes are more recalcitrant to “option maladministration” than policies with more moving parts (Mintz-Woo, 2022). This also makes them easier to administer because they require less information from regulators (Baranzini et al., 2017).

However, in the actual world, one or more of these idealized conditions may fail to be satisfied, leaving us with questions about how to enact nonideal tax policy. Doing so yields morally fraught choices, justifying discussion of these nonideal contexts. Furthermore, one suggestion of this review is that opponents of carbon taxes have in mind nonideal contexts, while proponents have in mind more ideal policy, further suggesting that it is important to engage with the moral issues arising from nonideal contexts.

3 | MORAL CHOICES IN NONIDEAL CARBON TAX POLICY

In an ideal context, there would be few or no trade-offs involved in making carbon tax policy. In the actual world, we are forced to make moral choices about what tax rates to set (where these are sensitive to numerous morally controversial assumptions); who the tax should apply to (involving moral questions about international obligations as well as raising issues about national self-interest); political acceptability (involving questions about the alternatives and common moral objections); and what should be done with revenues (where moral trade-offs between considerations including efficiency and distributive justice can arise). This section surveys relevant literature about several of these moral choices.

3.1 | Tax rate

Some opposition to carbon taxes is driven by concern about what the tax rate should be, expressed in units of dollars per metric ton of carbon dioxide (\$/CO₂). Textbook theory holds that the carbon tax should be equivalent to the social costs of a marginal ton of carbon dioxide (social cost of carbon, SCC), relative to an optimal baseline.¹

It is worth indicating that this is not the only way a carbon tax could be calibrated; one might want a carbon tax that is calibrated to be consistent with attaining some exogenous (independently-provided) goal such as a given climate temperature target. For instance, some have argued that “conventional” estimates of the SCC are below the carbon price levels consistent with the Paris Agreement goals (Boyce, 2018). However, since the classic view on a carbon tax is that it is there to change the incentives of potential emitters so that they make socially optimal choices, this review will adopt this view.

3.1.1 | The social cost of carbon

It is ideal to make the carbon tax equivalent to the social cost of carbon because, if these externalities were internalized, someone would pay the social costs of their emissions as taxes, leading that person to make socially optimal choices. However, significant criticism has been leveled about how the SCC is estimated (Pezzey, 2019; Pindyck, 2017), with both factual and moral assumptions being questioned. With this range of uncertainty about the SCC, some argue that this undermines the case for carbon taxes (Prasad, 2022).

To begin with, such opponents are correct that carbon taxes vary widely (the online Carbon Pricing Dashboard keeps track of global carbon pricing), often diverging significantly from estimates of the SCC (Wang et al., 2019; Watkiss & Hope, 2011). There are reasons for divergence on estimates of the SCC, many of which are driven by what we can call *morally laden carbon assumptions* (surveys of these moral assumptions include Fleurbaey et al., 2019; Mintz-Woo, 2021b). In response to this objection, it is worth noting two points. First, there is more agreement on some of the morally laden carbon assumptions than we might expect, both amongst economists (Drupp et al., 2018) and philosophers (Nesje et al., 2023). Second, although there is a large amount of disagreement about which carbon price is correct, there is wide agreement that the majority of existing carbon taxes are too low (High-Level Commission on Carbon Prices, 2017), suggesting that the practical issue is how to raise them to get closer to agreed levels, not which rate is theoretically ideal.

To illustrate the moral importance of the assumptions that go into estimating the SCC, here is a brief list of some of them (not all the relevant assumptions are moral, of course, some are factual, Pindyck, 2017; Pezzey, 2019; Grubb et al., 2021; Mintz-Woo, 2021b):

1. The SCC is highly sensitive to social discount rates, since the benefits of reduced emissions apply over decades while the costs are relatively close. Social discount rates indicate how much future costs and benefits are weighted, standardly with decreasing weight on future costs and benefits. Importantly, social discount rates apply to impure or measurable economic units, not to pure or morally important units like utility or welfare (Mintz-Woo, 2021a). For instance, a rate of 5% indicates that the costs and benefits of the first year are valued fully, the second year at 95%, the third year at 90.25%, and so forth. Using standard Ramsey (1928) discounting, social discount rates can be approximated by the sum of the pure rate of time preference, which has received the bulk of philosophical discussion (e.g., Arrow, 1999; Dasgupta, 2005; Davidson, 2015; Doeleman, 1980; Heath, 2017; Heilmann, 2017; Kelleher, 2017; Lowry & Peterson, 2011; Mogensen, 2022; Parfit, 1984; Purves, 2016; Rawls, 1972; Tarsney, 2017) and the product of the consumption growth rate and the elasticity of marginal utility of consumption, a measure of the curvature of the social welfare function. The basic idea is that, if consumption is growing, we should morally care less about increases in consumption (alternatively, that poorer current generations should be given more weight than richer future generations).
2. The SCC is therefore sensitive to the elasticity of marginal utility of consumption. Intuitively, if welfare or social value drops off more quickly as consumption rises, additional consumption to the well-off is comparatively less morally important. In the climate context, with the assumption that future generations are overall wealthier (i.e., that the consumption growth rate is positive), additional gains to them are less morally important. Some have tried to rebut this argument (Caney, 2008; Caney, 2009) and some defended it (Heath, 2021). One potential conclusion is that the rate at which moral importance of additional consumption rises is itself a moral judgment; Dasgupta (2005) calls this elasticity parameter the “ethical dual” of the pure rate of time preference. Mintz-Woo (2021a) defends the conclusion that this parameter is also subject to value judgments. Since utility functions are not static, but vary greatly depending on the context (e.g., risk-aversion versus consumption smoothing) and way of measuring, any social welfare function that incorporates these utility functions is also sensitive to the way we measure. This justifies thinking of parameter assignments as value judgments instead of as fixed by empirical facts (cf. Anthoff et al., 2009, p. 838).
3. Finally, the SCC is highly sensitive to international or interregional equity weighting (Anthoff et al., 2009; Anthoff & Tol, 2010; Watkiss & Downing, 2008). Several weighting schemes have been proposed, for example, schemes for impacts beyond a given country’s national borders. A country might weight foreign climate impacts equal to or differently from their own, and there might be multiple grounds to do so. If we considered damages in simple, unweighted economic terms, damages in poorer countries would be less serious than ones in wealthier ones since poorer countries would have lower willingness to pay to avoid these damages, and the economic costs, for example, of lost labor, would be valued less. One source of equity weighting is the same curvature of utility functions discussed in the previous points, if that curvature is interpreted as indicating inequality aversion.

This is far from an exhaustive list of the morally laden carbon assumptions influencing the SCC, which is subject to regular discussion and suggested updates (Pizer et al., 2014; Rowell, 2021).² However, it gives a sense of how morally complex it is to generate estimates of the SCC, estimates which are necessary if we are aiming at calibrating a carbon tax to the SCC.

3.2 | International coordination

For an ideal carbon tax, we can consider what policies a benevolent global social planner would enact, where this would involve coordinated global pricing. In practice, of course, we have a variety of regional and national governments, and these governments have different values and motivations. This nonideal circumstance has led to an objection to national action on climate change drawing on *realism in climate policy*. The issue is, if national governments are realist (i.e., nationally self-interested), can their motivations be made consistent with global carbon taxes (Barrett, 2003)?

3.2.1 | Political realism and national self-interest

Political realism is the thesis that policies are constrained by national self-interest. Posner and Weisbach (2010) argue that justice is superfluous in climate policy, and that climate agreements are politically or practically infeasible as long as they do not satisfy “International Paretianism,” that is improving each country's outcomes given that country's values. Following this line of argument (not necessarily as Posner & Weisbach do), since carbon taxes may involve national costs, and the climate benefits are predominantly international (i.e., the bulk of climate benefits do not redound to the nation's benefit), some carbon tax opponents may think that such taxes are rarely feasible.

There are three parts to the response. First, there is the legally and morally interesting question of whether national policies should reflect international effects, or whether they should at least in the case of climate change. Second, there is the empirical evidence that non-climate co-benefits of mitigation efforts are substantial, benefits that are independent of the intended, climatic, benefits. Finally, even if we grant the International Paretianist claim, it is not clear that the conclusion follows, for example, because additional policies, such as carbon border tax adjustments or carbon clubs, can generate incentives for countries to coordinate.

First, some deny that we should include international impacts since, when evaluating policies, most evaluations do not include international impacts (Fraas et al., 2016; Gayer & Viscusi, 2016). Including international impacts at all, given that this is not usually done, may require legal or moral justification (Mintz-Woo, 2018; Rowell, 2015). However, doing so in the case of climate change is appropriate given international reciprocal treatment of emissions (Howard & Schwartz, 2017), or because climate change is unusual in that the effects are predominantly international and the mechanisms by which emissions spread globally are both well-understood and predictable (Mintz-Woo, 2018). These arguments justify considering climate change policies in terms of their global impacts and not merely on national interest grounds, against the realists' position.

Second, even if we restrict ourselves to domestic impacts, it is not clear that aggressive mitigation policies are unjustified given national self-interest because the co-benefits of climate action are significant. In particular, reducing emissions often accompanies reduction of co-pollutants, improving air quality and reducing respiratory illness (Karlsson et al., 2020; Scovronick et al., 2019; Watts et al., 2021). This means that even granting that feasible policy is limited by national self-interest, there may be significant non-climate reasons to adopt climate policy.

Finally, we can consider the realists' arguments themselves, which have received significant attention in the philosophical literature, with objections to their welfarist assumptions (Bernstein, 2015), to their narrow construal of distributive justice (Bernstein, 2016; Sachs, 2014), disagreement about whether International Paretianism is incompatible with calls for fairness (Boran, 2017), and multiple concerns about precisifying what feasibility amounts to (Caney, 2014; Gardiner, 2017; Gardiner, 2021; Steele, 2021). Gardiner and Weisbach (2016) debate the issues at length, with Weisbach denying that he needs to defend a particular account of feasibility and asserting that his procedural rejection of justice in climate policy and Gardiner's substantive concerns about extant climate theories means that the two positions ultimately converge (Weisbach, 2021). Beyond philosophical objections, we might point to a variety of theoretical and empirical points undermining the realist position (Carattini et al., 2019).

3.2.2 | International tax policy

However, if the realist position is granted, it may be exacerbated by potential *carbon leakage*. In the absence of a supra-national social planner able to coordinate carbon taxes, simply implementing carbon taxes in one jurisdiction could incentivize production to move to other jurisdictions (Rendall, 2015; Shoyer et al., 2016; however, the actual extent of such leakage is an empirical question, and may be limited in practice, cf. Branger & Quirion, 2014). While this might blunt some of the mitigation potential of a carbon tax, Davidson (2008) points out that this form of argument is morally unsatisfactory by considering a historical analogy: that other countries engage in slavery does not license failure to censure it within one's own borders. However, another response is to complement carbon taxes with other policies that help address carbon leakage.

There is a similarity between the realism in climate policy and carbon leakage issues: internationally focused policy instruments can help address them. Consider realism in climate policy. Simply because national governments may select policies based on national values, it does not follow that most climate policies would be ruled out—even if we were to grant Posner & Weisbach's International Paretianist claim about feasibility. For instance, governments do not need to limit their national interest to economic benefits; they might have values they want to promote, or they may

have goals that are supported by international coordination (Jamieson, 2013). Furthermore, even if we limit national self-interest to national *economic* self-interest, Budolfson (2021) points out that national self-interest is affected by external or international threats or benefits. In other words, foreign policies can shift incentives in such a way that climate action is justified even on the narrowest economic self-interest grounds, that is, climate policy is compatible with realism when internationally focused policies generate the right incentives.

How would countries do this? Two indicative internationally focused proposals are *border tax adjustments* and *carbon clubs*. Border tax adjustments set a tariff for incoming goods that increases their cost to domestic consumers proportional to the carbon embedded in their construction. This would be applied to goods that are not already subject to (sufficient) carbon prices, making it the case that domestically and internationally produced goods are on a level playing field by all facing (equivalent) carbon prices once they enter a domestic market. These tariffs can be set up to be revenue-neutral, by returning any tariff revenue directly to the countries from which the goods originated (Baranzini et al., 2017). However, since this can disadvantage trade from the developing world, such policies have been argued to undermine global distributive justice (Brandi, 2013). There are also legal debates about whether border tax adjustments would be admissible under World Trade Organization rules (Sindico, 2016) with various proposals advanced (Monjon & Quirion, 2011).

Carbon clubs are coordinated groups of countries, where joining the group requires meeting some minimal carbon price criteria but where entry allows for club benefits (e.g., privileged trading status within the club) (Nordhaus, 2015). Such a group could share multiple goods, including clean technology transfer or mutual investments and, if well-designed, need not be large to begin with (Keohane et al., 2015). This could help address the issue of realism in climate policy by making the attraction of joining the club—and accessing club goods—sufficient to make it within a country's (narrow) economic self-interest to institute minimum carbon prices in order to join.

In principle, instituting border tax adjustments or creating climate clubs could help address concerns about free riding and realism in climate policy. This is not an exclusive list; other policies or institutions could also help overcome the challenges of coordinating international climate taxation. However, in nonideal circumstances where national policies may need to be supplemented by policies accounting for neighboring regimes, these types of policies may help address concerns about realism in climate policy. However, as they have not been discussed as much by moral philosophers, more ethical input would be helpful for evaluating their appropriateness.

3.3 | Political acceptability

Ideal carbon tax policy would be politically acceptable, and this acceptability would make the tax policy predictable so that private sector actors could plan appropriately. In practice, however, carbon taxes have proven politically challenging, with a high-profile repeal in Australia (Crowley, 2017) and a hold on fuel-tax increases in France (Carattini et al., 2019).

3.3.1 | Evidence about political acceptability

Opponents of carbon taxes seize on cases like Australia and France to argue that carbon taxes are politically unacceptable (Mildenberger & Stokes, 2020). Furthermore, research suggests that many voters are reluctant to endorse carbon pricing policy, for instance because they do not understand that increasing the prices of emitting reduces emissions (Carattini et al., 2018; Klenert et al., 2018; Maestre-Andrés et al., 2019), or because right-leaning subjects are concerned about compensating vulnerable groups whereas left-leaning subjects either want little compensation or earmarking of funds for environmental projects (Jagers et al., 2019). Even more concerning, while many voters express interest in fairer policies or ones that compensate vulnerable groups, Mildenberger et al. (2022) found that in jurisdictions with extant carbon tax policies in Canada, voters consistently underestimated the level of redistribution and, when informed about the actual amount, stated only minor shifts in their support for carbon taxes, apparently mediated by political positioning.

Proponents of carbon taxes respond that a well-designed carbon tax would be self-sustaining because it would develop a political constituency (Carattini et al., 2018; Carattini et al., 2019; Klenert et al., 2018). Furthermore, they can point to notable success stories, such as British Columbia (Harrison, 2012), where political acceptability and reductions in emissions relative to expected trajectories appear to have been achieved (Murray & Rivers, 2015).³

BOX 1 Alternatives to carbon taxes

Aside from voluntary approaches such as individual carbon offsets (Hyams & Fawcett, 2013) that rely on prosocial or altruistic motivations, there are two main categories of coercive policies: *carbon pricing* (sometimes called *market-based instruments*) and *command and control legislation* (Mintz-Woo, 2022). Command and control legislation prohibits or sets specific limits on emissions. Carbon pricing comprise carbon taxes and cap and trade schemes. Cap and trade schemes set a limit of carbon permits (a “cap”) and allow those permits to be traded by emitters depending on their need. In a well-functioning market, those who can get the most value from the permits will end up buying them whereas those who can most cheaply abate their emissions will sell them, making it the case that the emissions are directed to their most efficient use. This market for permits generates a price on carbon.

If carbon taxes are thought to be politically unacceptable in a given jurisdiction, both command and control legislation and cap and trade schemes may be more acceptable. The reason is that, unlike carbon taxes, the costs of limiting emissions are less transparent to citizens (Jagers & Hammar, 2009). In both cases, these may be less politically objectionable, because the costs of compliance are hidden. However, they do both involve compliance costs—indeed, all methods of reducing emissions, carbon tax or otherwise, make it costlier to emit. If it were not more costly to emit, we would not expect emissions to fall. So what these policies hide is precisely what makes them effective. Furthermore, unlike carbon taxes, these alternatives may not generate the revenue to address distributive issues (Baranzini et al., 2017; Carattini et al., 2018).

While the literature on the political acceptability is not definitive, it suggests that carbon taxes might not be as politically acceptable as alternatives (Rabe, 2018). Proponents of carbon taxes should not rest assured even once their preferred policy is adopted. As Mildenerger (2020) explains, they need to consider the full policy lifecycle, not only passing legislation but making sure it is not repealed and does not undermine the politicians who advocated for it. In this sense, while the transparent costs of carbon taxes may contribute to political resistance, alternatives also require costs and, regardless, it is the costs themselves that reduce emissions. If people understood that carbon taxes generate the right incentives to reduce emissions for everyone, there could be more support for such policies (Carattini et al., 2018). However, for those who think that the nonideal contexts make carbon taxes political nonstarters, it is worth indicating the primary alternatives (see Box 1).

3.3.2 | Some politically important concerns about carbon taxes

We can also turn to some of the specific normative criticisms that have been raised to carbon taxes. One common moral concern opponents have to carbon taxes is that these taxes can increase regressivity (Caney & Hepburn, 2011; Tank, 2020). This concern is that the tax is disproportionately borne by those lower on the income scale, exacerbating distributive inequality, since a larger proportion of poorer people's budgets may be energy-intensive.

While it is true that in many contexts, the initial incidence of carbon tax (the costs of paying the tax) are regressive, it is neither necessarily true nor, indeed, universally true. In poorer countries, the initial incidence can be progressive (Dorband et al., 2019), since those who are poorer in these countries cannot afford cars and so energy-intensive purchases like gas are restricted to those who are wealthier. This means that in these poorer countries, generally speaking, only the *wealthy* would have to pay a carbon tax, making the initial incidence progressive.

However, even if we limit ourselves to countries where the initial incidence of the carbon tax is regressive, the initial incidence is not the only effect of carbon tax policy. It depends on how the revenue is used. A toy example from Mintz-Woo (2022) shows how using the revenue can become progressive. Suppose you are much richer than I am and spend \$10,000/month. I only spend \$1000/month. A carbon tax is introduced and, because the initial incidence of a carbon tax is regressive, it hits me harder. Let us say that you end up being taxed effectively at 5% so you spend \$500/month on this carbon tax. However, we assumed that the initial incidence is regressive since, for instance, more of my monthly spending is on products like gas. Suppose I end up being taxed 10% or \$100/month. Now let us suppose the government simply divides up all the revenue and, using equal per capita distribution (i.e., without reference to anyone's wealth or

contribution size), provides both of us with $[\$500/\text{month} + \$100/\text{month}] \div 2 \text{ people} = \$300/\text{month}/\text{person}$. You end up net $\$200/\text{month}$ down ($-\$500/\text{month} + \$300/\text{month}$) but I end up $\$200/\text{month}$ up ($-\$100/\text{month} + \$300/\text{month}$). In other words, even though the initial incidence of the tax we assumed to be regressive and even though we rebated the tax revenue in a nonprogressive (simply flat) way, the net result is still a progressive transfer from the richer to the poorer! In short, this suggests that some of the objections to carbon taxes which contribute to political unacceptability can be met by using tax revenues in an appropriate way. In other words, political acceptance may hinge on the ways that carbon tax revenues are used—an issue discussed below.

Another politically important concern about carbon taxes is that they would be a general drag on the economy, such as by reducing competitiveness or stifling technological advancement. However, real-world support for this concern is limited, with most work finding that the macroeconomic impact of introducing carbon taxes being slightly positive (but limited and often statistically insignificant regardless; Metcalf and Stock, 2020). The point here is that carbon taxes are meant predominantly to change the relative prices of emissions-intensive activities, their other effects on economies can matter, but are considerably more limited. Their redistributive effects are also relatively limited, as discussed in the next section.

3.4 | Revenue use

Ideal carbon tax policy is economically efficient—it sets the right incentives for rational individuals to emit only when the social benefits outweigh the social costs. However, it does not necessarily answer the distributive justice question: how should those costs be borne and how should benefits be distributed?

There are multiple ways that governments can divide up options for carbon revenues from a carbon tax (Steenkamp, 2021). For instance, we can ask whether the revenue usage is *constrained* (“earmarked” for specific uses) or *unconstrained*. Governments can determine whether they want the carbon tax to be *revenue-raising*, meaning that (some of) the revenue goes toward governmental priorities, or whether it is *revenue-neutral*, meaning that all of the revenue is recycled or rebated to taxpayers. However, this paper takes a thematic approach, considering some moral arguments about several *types* of spending, where these types of spending can be mixed and matched—and need not exhaust all the carbon tax revenue.

First, carbon tax revenue can be used to provide exemptions or payments for individuals when energy or other carbon-intensive goods become unaffordable. This allows poorer individuals to avoid the extra costs of a carbon tax.

This option is politically appealing and is not susceptible to the same type of arbitrariness objection. It is politically appealing because the government is directly helping those who are most burdened by a carbon tax. For the same reason, it is a use of revenues which is not arbitrary; the revenue usage addresses some of the distributive burdens generated by its initial incidence. However, in paying for the carbon-intensive goods, the government is reducing the incentives to reduce emissions. It is counterproductive, since the carbon tax revenues would be used to undermine the incentives that the carbon tax introduced. Furthermore, this is subject to concerns about unfairness since this will involve arbitrary boundaries on granting exemptions, with some people getting significant benefits and similar, but slightly better off, people not receiving them.

Second, carbon tax revenue can be used for further tax reform, especially reduction in other tax rates (like labor or income taxes). This has been implemented, for example, in British Columbia (Murray & Rivers, 2015), and is sometimes advocated for because it reduces market distortions. Since taxes generally add friction to market transactions, they can distort the economy, so lessening them helps to minimize the economic costs of the policy, increasing its potential efficiency (Prasad, 2022). The theoretical case for this is twofold: (1) increases taxes on “bads,” like emissions, to discourage their use, helps improve environmental behavior, but this revenue can be used to (2) decrease taxes on “goods,” like labor, to encourage more labor activity, also helps improve economic contexts. This kind of tax “shift” in principle can yield a “double dividend” (a benefit both to environmental and economic contexts; Goulder, 1995). This possibility has also been explored in modeling, with many studies finding environmental benefits with more ambiguous or subtle results for improvements in (macro)economic conditions (e.g., Freire-González, 2018).

However, this option is both politically unpopular and morally difficult to justify. Different analyses have revealed that using carbon tax revenues to reduce existing taxes is politically unpopular in multiple countries (Carattini et al., 2018). Furthermore, it is dangerous because carbon tax revenues may decline over time, making this option practically fraught (Prasad, 2022). Using carbon tax revenues to replace other tax revenue risks ending up with a diminishing stream of revenue, potentially forcing unexpected and unwelcome cuts to government services. Finally, it

is difficult to justify since it is unlikely to reduce the regressivity of the initial incidence of carbon taxes—and the usage of the revenues has no theoretical connection to the payments, making it unfair and arbitrary to citizens.

Third, carbon tax revenue can be used to supplement the general operating budget now (or in the future, by paying off debt). In principle, governmental spending is endorsed by citizens so general funds are used for public priorities.

However, this option is also politically challenging and subject to a similar kind of arbitrariness. Distrust of government means that citizens do not link the benefits of (new) taxes with various uses of government spending, so boosting general operating funds is seen as little or no benefit (Klenert et al., 2018; Hammar & Jagers, 2006). Furthermore, unless we expect that general government funding is going to the most morally important uses, it is difficult to see why this is where these revenues should go, even given the theoretical democratic responsiveness of government budgets to citizens.

Fourth, carbon tax revenue can be used to address the distributive impacts of a carbon tax, but by rebating the revenues independent of the usage of the carbon-intensive goods. A commonly discussed mechanism is a lump sum payment, which at its simplest is an equal per capita payment (discussed in the previous section above). In many contexts, this offsets the regressivity of the initial incidence of a carbon tax, making it slightly progressive (e.g., with the poorest 70% getting more in their payment than they would be expected to pay and the richest 30% getting less in their payment than they would be expected to pay; Baranzini et al., 2017).

This option is politically appealing and morally justifiable from a distributive justice point of view. Its political appeal may be important to generating coalitions supporting carbon tax policy (High-Level Commission on Carbon Prices, 2017). Such lump sum payments can be made in politically salient ways (like mailing checks) that are explicitly linked to carbon taxes in such a way that people understand that their carbon taxes are being returned to them. Even if the lump sum payment is a simple equal per capita division, it can generate progressivity (and is more straightforward to implement). Morally speaking, it is fair that people are treated equally and it is important that people's checks are independent of the carbon-intensity of their purchases such that, regardless of how wealthy they are, the disincentive to increase emissions persists. This is not to say that the goal of such a tax and rebate is progressive taxation; it is best thought of as a positive side-effect. Finally, this is not arbitrary because the revenues are used in ways that are directly relevant to the carbon tax, namely to address any distributive injustice it generates.

Fifth, carbon tax revenue can be earmarked for related—climate or environmental—projects. These may involve mitigation efforts (e.g., increased public transport), or building green infrastructure (e.g., transmission for electricity). If we consider the harm that emissions can generate through climate change, such revenue usage is clearly relevant since mitigation can help address (other) climate harms. Of course, this is superfluous in optimal contexts, so only applies when additional spending on related projects is socially beneficial, accounting for incentive changes from the carbon pricing policy.

While it is difficult to discuss such uses in general—since the effectiveness of such projects can vary greatly—this also seems like a politically and morally acceptable option. Carattini et al. (2017), surveying the literature, conclude that such earmarking revenue uses are the most politically popular uses in focus groups from across a variety of European countries. Morally speaking, if we take future mitigation efforts to help offset the effects of current emissions (Broome, 2012; Broome, 2019), then such uses of revenue are not only morally relevant, but can potentially be exculpatory. If we think of the externalized costs as unjust or as involving moral wrongdoing (Heath, 2021), then using the revenues to pre-emptively reduce other wrongdoing is a kind of *ex ante* risk balancing. Using the revenues in this manner is also nonarbitrary, since the use of the revenues helps to address the effects of the taxed emissions.

Finally, carbon tax revenue can be used to compensate those harmed by climate change, whether nationally or internationally (Eggleston, 2020). This is less often considered by political actors, since most of the effects of climate change are international and carbon tax revenues being used internationally is difficult to defend politically. The revenue, perhaps subject to investment, could be protected in such a way that they would be disbursed only when sufficiently serious or traceable climate impacts occurred.

Politically speaking, this would be extremely ambitious, since this would involve revenues being sent across borders. Distinguishing between a global carbon tax and harmonized domestic carbon taxes (Hoel, 1992), one morally important question is how international transfers could be arranged under a global carbon tax (domestic carbon taxes, even if harmonized, would not be subject to such transfers): for instance, would they be responsive to the initial incidence of the carbon tax or to the climate harms (or some combination)? Furthermore, it would be difficult to safeguard the revenues in order to award them for losses and damages that are sufficiently serious or traceable. However, the European Union Emissions Trading Scheme involves international markets and resources being sent from browner countries to greener countries. And, in terms of safeguarding the resources, some have proposed institutions that have similar structures

(Broome & Foley, 2016). Morally speaking, this would be the ex post version of the previous use of revenues: instead of finding ways to reduce the climate risk, the governments wait until there are climate harms and then use the revenues to compensate on that basis.

This demonstrates that different uses of carbon tax revenues can be morally (and politically) justifiable. One key issue is which form of injustice we are considering. On the one hand, if we want the uses of revenue to respond to distributive impacts of carbon taxes (i.e., who finds it more difficult as a result of the initial incidence of the tax), the first option of lump-sum payments is morally justifiable since it reduces the distributive injustice of implementing the carbon tax. On the other hand, if we take the emissions to be wrongdoing or unjust in themselves, then we need the revenues to address the harms in a compensatory or corrective justice. That means that the revenues should be focused on those who are potentially harmed by climate change, in either an ex ante (the fifth option of mitigating future climate change) or an ex post (the final option of saving resources to address those who are harmed directly) manner. Regardless, the key conclusion is that some there are uses of carbon taxes which are both politically and morally acceptable.

4 | CONCLUSION

The contention of this piece is that, from a moral point of view, carbon taxes in ideal circumstances are easily defensible. They can be defended using different moral frameworks, and they have many theoretical virtues. Our actual, nonideal circumstances give rise to a variety of moral issues, some of which have been discussed in the philosophical literature.

One reason this matters is that, even in contexts where carbon taxes are politically infeasible, that is no reason to refrain from considering them as ideal policy in other contexts, especially given international success stories discussed above (Section 3.3). For example, in the United States, carbon taxes (as opposed to technology subsidies or even cap-and-trade systems) appear to be too politically unpalatable to be adopted. A *New York Times* column from the economist Paul Krugman (2022) is a good example of this type of position; in it, Krugman endorses carbon taxes as the ideal (literally, textbook) policy for addressing climate change but defends second-best policy alternatives. But this kind of sour grapes reasoning should not undermine consideration of policies which could be implementable elsewhere (or at other times) or deeper understanding of the moral implications of these kinds of policies.

This review focused on the following issues arising from nonideal contexts:

1. The rate of a carbon tax depends on the SCC, but the SCC is sensitive to a variety of morally laden assumptions, and there is disagreement about how to adjudicate these assumptions.
2. Realism in climate policy, if correct, can undermine the prospects for global coordination of carbon taxes and other climate efforts. Concerns about free-riding are exacerbated by the issue of carbon leakage.
3. Carbon tax policies can be supplemented with other policies or institutions, like carbon border tax adjustments or climate clubs, in order to address concerns about realism and carbon leakage.
4. Many are concerned that carbon taxes are politically unacceptable, with case studies and empirical evidence suggesting that carbon taxes are difficult to establish.
5. Some common moral concerns about carbon taxes can be addressed. In particular, carbon tax revenues can address the regressivity of the initial carbon tax incidence, even when the revenues are rebated in a manner which is not explicitly progressive.
6. Finally, there are a variety of uses of carbon taxes, with a mix of political and moral acceptability. If we want the revenues to address the distributive effects of carbon taxes, then lump sum equal per capita rebates work. If we want to use the revenues to implement corrective or compensatory justice, then earmarking the revenues to decrease ex ante climate risks or to address ex post climate losses and damages can serve those purposes.

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ENDNOTES

- ¹ It is also worth noting that a carbon tax in an ideal context would lead to carbon abatement up to the cost of the carbon tax. For a given (comprehensive) carbon tax, abatement, sometimes arranged in a marginal abatement curve, would be performed until the marginal cost of abatement would outweigh the costs of the tax. In the actual world, divergence between the marginal cost of abatement and extant carbon prices evidence market distortions (and incomplete coverage of carbon prices). In short, in ideal circumstances, we would expect cheap mitigation measures to be adopted (as long as they were cheaper than carbon taxes) but even in jurisdictions with carbon taxes, we can identify easy to abate emissions. This is one way of demonstrating that we are in non-ideal market circumstances.
- ² The way that the United States government deals with these problems is to run several different influential models and then averaging the resultant social costs of carbon. The Interagency Working Group on Social Cost of Greenhouse Gases (2021) provides more details.
- ³ Indeed, even wording can change political acceptability, with the use of the terms “(carbon or pollution) fee” or “fee-and-rebate” for a carbon tax with recycled revenues apparently increasing the acceptability of the policies (Klenert et al., 2018).

FURTHER READING

Carbon Pricing Dashboard. <https://carbonpricingdashboard.worldbank.org/>. Provides an up to date global outlook on current carbon prices, including carbon taxes.

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