STUDY

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A Climate of Equality

Protecting the Environment and Safeguarding Justice in a Progressive Tax System

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1. INTRODUCTION

1.1. A Climate of Unfairness: Dimensions of Inequality in Climate Policy

The VIDC 2018 publication *A Climate of Fairness* sought to consider whether and how environmental taxation might be designed and implemented in alignment with the principles of tax justice, equity, and fairness in low- and middle-income countries (LMICs). Since that report was published in 2018, the debate around tax justice and carbon pricing has intensified, with environmental taxes becoming ever more prominent on the agenda of tax justice campaigners. This report seeks to contribute to this debate.

The first edition of *A Climate of Fairness* examines four key dimensions of inequality in climate policy. All four correspond, more or less, to income inequality. All are highly relevant considerations for the consideration of tax justice, equity, and fairness. A brief consideration of each serves to frame and inform the subsequent discussion and to clarify what we might mean when we use terms such as 'fairness' and 'justice' to describe policy outcomes.

Inequality of exposure to environmental degradation. The poorest are disproportionately exposed to and affected by food price spikes, natural disasters, and climate-driven livestock diseases (Hallegatte et al. 2016). Indeed, climate change and environmental degradation are obstacles to poverty alleviation. Climate change threatens to push as many as 132 million people into poverty by 2030, and it poses the gravest threat in regions where the global poor are concentrated, in Sub-Saharan Africa and South Asia (World Bank 2020).

Inequality of contributions to pollution. Contributions to CO_2 emissions today, as historically, are starkly unequal (see Figure 1). Both within countries and on a global scale, the wealthiest are responsible for far higher CO_2 emissions than the poor.

Inequality of representation in policymaking. Unequal representation of high- and low-income groups in policymaking around the world in relation to a wide range of issues, including climate change and environmental degradation, is a well-recognised challenge to democracy (see e.g. Lupu and Warner 2021).

Inequality of outcomes resulting from environmental taxation. Concerns about possible negative equity impacts and perceptions of unfairness regarding the implementation of potentially regressive environmental taxes constitute a significant obstacle to the implementation of environmental taxation as an effective tool to mitigate climate change (see e.g. Mager and Chaparro 2023).

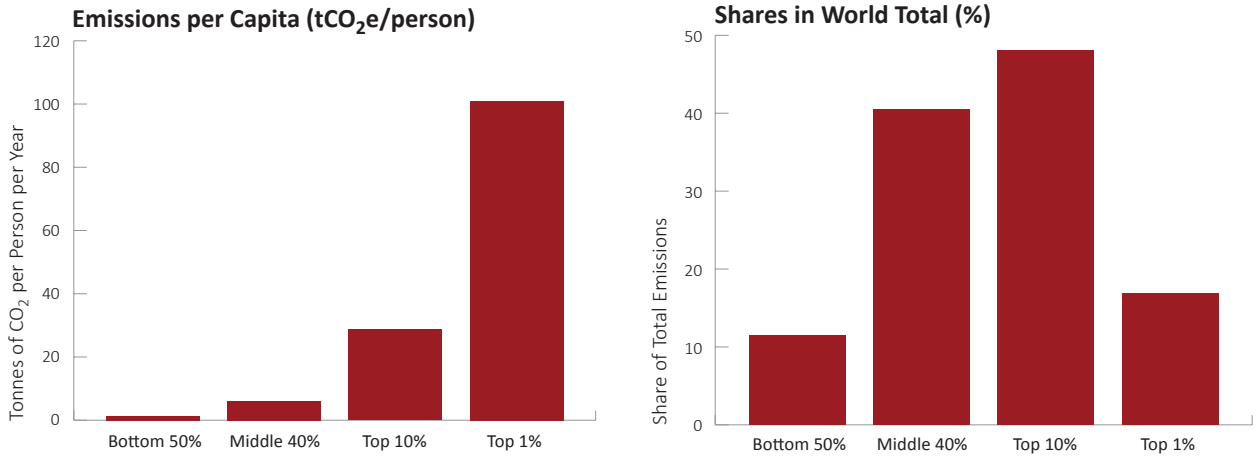

Figure 1: Emissions per capita and the share in global emissions by global emitter ranking (2019)
Source: Chancel et al. 2023

Our discussions will focus on two of these dimensions, in particular: fairness in terms of *contributions to pollution* and *outcomes resulting from environmental taxation*.

In this paper we explore ways to tackle these dimensions of inequality using environmental taxation. We seek to demonstrate that there is no need to compromise between using taxes as an instrument of environmental and climate policy and the creation of a progressive, fair, and just fiscal system. In so doing, we build on many of the arguments put forward in the first edition of *A Climate of Fairness* in 2018, complementing them with new developments in the tax justice debate and with new findings and research on environmental and carbon taxation in LMICs.

1.2. Reconciling Tax Justice and Environmental Taxes

When it comes to advocating for the achievement of greater environmental impact through the use of the tax system (where impact is measured through the mitigation of carbon emissions; see Parry et al. 2012 and Falcão 2024a), a recurrent theme that faces the tax justice movement is how to reconcile a carbon tax (or any type of Pigouvian tax[1]), with the typical advocacy points that the tax justice movement stands for: equity, fairness, and the progressivity of taxes.

This question is often presented as an either-or situation in which the tax justice movement must make a choice between (i) supporting effective climate policy measures that are capable of pursuing emissions reduction, (ii) advocating for the rights of the more vulnerable countries or classes of society, or (iii) suggesting novel models of taxation with varying trade-offs of objectives that make them less efficient in achieving climate mitigation goals but more equitable or progressive in nature. All proposals that involve the use of direct tax instruments to tackle carbon emissions, such as wealth taxes on the richest for the purpose of financing climate goals, fall into this last category.

In the quest to situate the tax justice movement within the climate debate, oftentimes the debate is translated into a choice of what to privilege:

(i) environmental gain through an instrument capable of rendering measurable and verifiable emissions mitigation;
(ii) justice, here understood on a macro level as equity in the distribution of income between low-, middle-, and high-income countries or on a micro level as impact distribution between high- and low-income households within a country's national borders; or
(iii) progressivity in the tax system, which can be understood to mean progressivity in the instrument of choice or progressivity in the operation of a country's broader fiscal regime.

From a tax justice movement perspective, these are crucial questions. Incidentally, these are also questions that burden policy makers at the country level as they consider how to navigate this new landscape in which they must create sustainable economic development through the administration of tax policy.

An additional dimension to this debate are considerations of inter-nation equity and fairness and how these country-to-country notions of climate fairness square with purely domestic considerations that apply on a local taxpayer-to-taxpayer basis.

Many of these points, particularly the point of equitability between countries, have been recurrently put forward by countries that have not made significant contributions to climate change.

This debate also encompasses several contemporaneous tax policy issues that countries are contending with now, such as (i) whether to use a direct or indirect tax instrument to achieve the climate goals, (ii) whether the instrument should, through its own working, be progressive in nature, and (iii) whether it is admissible for some countries to impose economic pressure on others to increase the level of ambition regarding climate mitigation action.[2]

Various arguments can be made as to the appropriate trade-off with regard to, in particular, the aforemen-

1 Broadly speaking within the context of environmental taxation, Pigouvian taxes are taxes that are incident on a negative environmental externality (such as CO_2 or pollution). The objective of such taxes is to recoup the cost of the externality and so compensate society for the collective loss resulting from the release of an additional tonne of pollution (i.e. loss to health, air quality, or biodiversity). Thus, in general terms the Pigouvian tax translates into an environmental cost of doing business. See Section 4.2 for a more detailed discussion.

2 Manifested through the many Border Carbon Adjustment proposals flourishing across the globe, the most prominent of which is the European Union Carbon Border Adjustment Mechanism (CBAM).

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tioned goals: the environment, justice, and progressivity. In this debate, normally, the heavier the weight attributed to the preservation of justice and progressivity, the easier it is to argue for the use of direct tax instruments in pursuit of emissions mitigation.[3]

However, this paper argues that, if carefully designed, there does not need to be a choice between the different instruments or outcomes. Assuming that obtaining a positive environmental outcome is a non-negotiable policy goal, we demonstrate that it is possible to also achieve justice and progressivity in the administration of a tax instrument, provided one perceives it as being an integral part of the domestic tax system to which it belongs.

In this sense equity is achieved through a uniform division of taxing and credit rights between high- and low-income households. Progressivity is likewise achieved not through the working of the instrument alone but in combination with other fiscal (tax- and expenditure-based) policies.

This paper is divided into several sections, each of which discusses one of the goals of a progressive climate policy advocacy programme in which justice and fairness are integral parts of the policy outcome. Section 2 describes how taxes can most effectively deliver on climate and environmental goals. Section 3 considers how progressivity can be achieved through the implementation of complementary measures. Section 4 examines key design considerations for policymakers in LMICs to ensure that progressivity is achieved in practice in their countries. Section 5 considers how justice can be safeguarded at both national and international levels, and Section 6 concludes.

3 A few studies have been published in support of the use of direct tax instruments for an environmental objective. Many of these studies use the industry (i.e. an extractive enterprise) or business in question (i.e. an energy intensive business) as the proxy to establish a connection to the environment. The tax in some of these proposals is levied in the form of a price-based royalty or a windfall tax. See for example: Clausing and Durst 2015.

2. PROTECTING THE ENVIRONMENT

2.1. Defining an Optimal Environmental Tax

From an environmental perspective, the distinctive feature that makes a tax 'environmental' is its ability to establish a direct relationship between the pollution (or the environmental bad targeted via the measure) and the tax rate (or price). The wider the disconnect between the pollution and the applied price, the less likely the measure will directly impact the consumption pattern of a good or service.[4] That is why, from a theoretical perspective, indirect taxes with the ability to impose a specific price on an 'environmental bad' are considered more effective in mitigating carbon emissions or other sources of environmental harm (e.g. pollution) than are direct taxes that impose an additional layer of income tax on a shareholder or company that manufactures goods or renders services known to be, for example, greenhouse gas (GHG) emissions–intensive, such as fossil fuel exploration and extraction, mining, or dairy farming, or that are a significant source of air, water, or soil pollution.[5]

In establishing the linkage between tax base, tax rate, and environmental impact, a specific excise tax on carbon is capable of inflicting a direct price on a quantity of carbon (or a proxy of it), measured in weight or volume. A corporate income tax, on the other hand, will tax the profits of an enterprise, which may or may not be directly related to the amount of fossil fuel sold or consumed by that enterprise; the connection between the tax and the polluting material (e.g. carbon inbuilt in a fossil product) is only indirect. So, for example, assume an additional layer of income tax on the profits of an extractive entity – such as a windfall tax on oil and gas. Before those profits are taxed, they might be reduced by specific incentives, depreciation allowances, amortisations, price fluctuations in the overall price of oil, indexation of prices, etc. Numerous economic and monetary actions may therefore come to influence (i) how much income is generated and (ii) the frequency with which it is ultimately perceived and, eventually, (iii) taxed. All these factors have nothing to do with the polluting ability of a product or sector, even if the business from which the income is derived is known to be carbon intensive.

So, from an environmental effectiveness perspective, indirect taxes trump direct taxes, and specific excise taxes trump ad valorem taxes. That would be the order of importance when it comes to developing a tax policy that is capable of rationalising the consumption of fossil fuels according to their ability to pollute.

Even if there is a purported order of pre-eminence in environmental impact between the different tax policy instruments, it is clear that a government will make use of all the instruments in the menu to build its climate tax strategy. This is why the economic theory behind climate pricing calls specific excise taxes, which possess the ability to inflict a direct (explicit) price on carbon, alongside ad valorem taxes that only impose an indirect (implicit) price on carbon. The price is implicit because the tax burden is on the final price of the commercialisation of the good or service (the commercial price), which comprises more elements than just the polluting ability of the product. The relationship between price and pollution is therefore indirect.

Direct taxes, such as income or profits taxes, are generally referred to as environmentally related taxes. This is because such taxes are capable of establishing neither a direct nor an indirect correlation between the

4 This notion feeds into the definition of a carbon price. The more direct the connection between the incidence of the tax and the externality, the easier it is to qualify it as a price. In the current literature, a distinction is made between explicit and implicit prices. Instruments known to confer an explicit price on carbon are capable of attaching a price to a known volume or quantity of carbon. It is explicit because there is a direct connection between the applied tax and the price increase that is proportional to the carbon embodied in the product. Carbon taxes are also specific, i.e. ad quantum taxes. This differs from an implicit price, where the connection is indirect and the tax only burdens the final cost of commercialisation of the product (the ad valorem price), which is formed by many other factors besides carbon intensity (see Falcão Tatiana 2024b).

5 A strong focus of this article is carbon taxation, as it is the subject of a great deal of debate within the tax justice movement and is considered a key instrument in the policy toolkit to mitigate climate change. However, we do not exclude other environmental taxes, such as pollution taxes and taxes on transport.

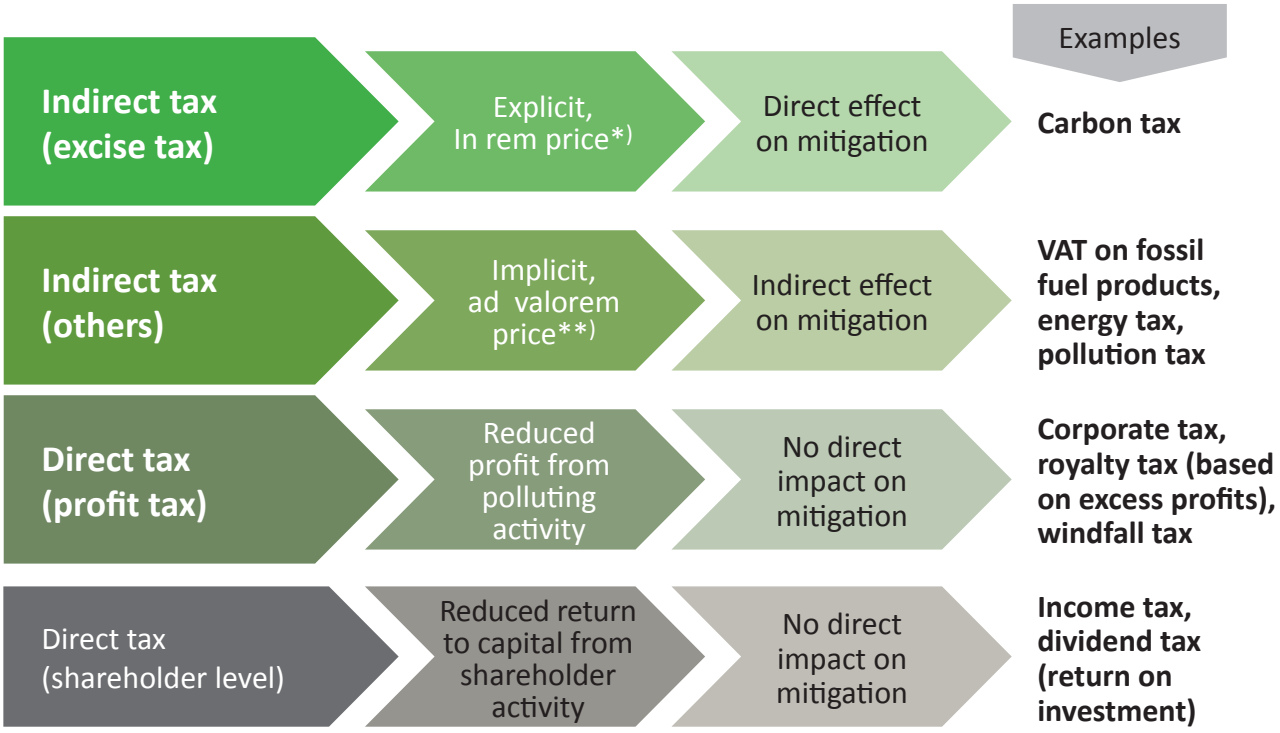

Figure 2: Comparison between direct and indirect environmental and environmentally related taxes

*) In rem price is a price on an object (in this case an object of pollution, like carbon).

**) Ad valorem price is a price on the value, i.e. on the final cost of commercialization of a product.

price and the pollution subject to tax; the tax is applied to the profits of an enterprise or on the return from capital of an individual investing in a particular business activity known to be carbon intensive. When a tax is said to be environmentally related, it aims to capture the negative externality associated with the activity, but the impact of the tax cannot be easily measured or is unknown. Environmentally related taxes are often described as revenue raisers (Falcão 2013, ATAF 2021, United Nations 2021).

This explanation may sound excessively theoretical, but it is important to set the right tone when identifying the tax as a policy instrument with the ability to derive a measurable environmental impact. If a strict distinction is not created between one type of tax and the other, there is a risk of watering down tax policy approaches – instruments could be conceived with an environmental objective but be incapable of delivering the intended environmental impact. For statistical purposes, too, distinguishing between an environmental and an environmentally related tax, or between an explicit and an implicit price, can be an important exercise to showcase the meeting of Nationally Determined Contributions (see UNDP n.a., Goal 13, p. 174) and adhesion to the targets of the Paris Agreement, as well as to estimate how a country is fairing in meeting its wider climate mitigation targets (ATAF 2021).

This has been the object of debate in international tax policy for over a decade. In discussing this issue, the *UN Handbook on Carbon Taxation for Developing Countries* (2021) has absorbed the Organisation for Economic Co-operation and Development (OECD) definition for environmentally related and environmental taxes, as well as put forward a definition for carbon taxation that is important in fostering the connection between the environmental purpose of the tax and the effect.[6]

2.2. The Inherent Regressivity of Indirect Taxes

In spite of the above, it is clear that from a tax justice perspective, the more direct the correlation between the polluting ability of the product and the price, the more regressive the tax. This is because the price impact of the measure is inflicted on all its subjects, without judgment as to their ability to pay. It is clear that

6 See also T. Falcão, A Proposition for a Multilateral Carbon Tax Treaty, IBFD, 2019.

true progressivity can only be achieved through the imposition of a direct tax because such a tax is designed with a person's ability to pay in mind. This speaks to the very nature of each type of tax.[7]

The objective of a direct tax such as an income tax is to be neutral. It does not aim to forestall economic activity or productive behaviour – its objective is to stimulate economic activity while taxing the profit associated with it.

The purpose of a behavioural indirect tax like a carbon tax,[8] on the other hand, is to influence or curb the given behaviour by using an economic incentive to make individuals react to the price. The tax is successful if the behaviour or consumption ceases to occur. A successful carbon tax generates zero revenue in the long term because economic activity ceases to take place. The tax is therefore not neutral, and for this reason, the tax rate required to bring about behavioural change is not necessarily reasonable, either (see Section 4.2). The rationale is that it changes consumption patterns, leading to the extinction of a certain consumption relationship. For that to happen, there can be no ceiling on what a government can tax. It is whatever the market is willing to pay, considering the energy options available to the consumer. A high carbon price is conditional on the availability of alternative, affordable, viable technologies and energy sources in order to avoid eliminating that economic activity in the domestic territory.

Trying to transfer the attributes of an indirect tax to the direct tax system is not desirable (using the income tax system's progressive nature) because such a transfer may lead to double or triple taxation without a positive environmental outcome. Consider an example in which a tax system imposes an additional royalty on income from extractives, then establishes a surplus tax rate band on profits and taxes shareholders an additional layer of dividend tax when they derive income from an extractive enterprise. Even though there have been three new tax events that may indeed be revenue-raising opportunities, none would lead to mitigation or a change in behaviour on the part of the enterprise,[9] as the enterprise's only impetus will be to produce more profits, so that it may increase its net gains despite the additional layer of tax on income.

Progressivity is therefore not best obtained through the individual working of the instrument targeting emissions mitigation. Rather, it is best achieved by taking into account the operation of the instrument and considering it as an integral part of the entire fiscal system – taxes and expenditures (see UNDP n.a., Goal 13, pg. 174). Only through complementary and reinforcing tax and expenditure measures can the overall domestic tax framework be neutral towards all the income layers of society.

BOX 1: WEALTH TAXES

Several proposals for carbon wealth taxes have been developed. Some propose a levy on carbon-intensive investment portfolios as a complementary instrument to a carbon tax, with the objective of curtailing investments in carbon-intensive financial assets with high lock-in potential (see e.g. Neves and Semmler 2021). Others are designed as wealth taxes with a pollution top-up element (see e.g. Chancel et al. 2023).

Others are luxury taxes, such as the imposition of high taxes on private jets and luxury yachts that are currently being called for by Oxfam UK (Oxfam 2024).

Such proposals are highly relevant for climate and environmental policy but are not levied directly on an environmental tax base. All are legitimate instruments of tax policy that, if implemented, can turn the dial closer to the realisation of tax justice. Such instruments also have a clear role to play in redistributing the burden of taxation more equally in the future and in financing a progressive and inclusive social and ecological welfare state.

7 At the same time, in particularly poor and inequitable countries, some environmental taxes may act as 'luxury taxes' and have progressive impacts – see Section 4.6.

8 There is extensive literature on the mechanics of a carbon tax. See, for example, the following: Metcalf G.E. 201; IMF 2019a; IMF 2019b, p. 3; Ramseur J. and Parker L. 2009, p. 2; and Pigou 1920, supra n. 11.

9 It is contended that there may be a behavioural change on the part of the enterprise or investor if the additional layer of income tax influences corporate decisions to diversify the business practice to escape that extra layer of tax or, from a shareholder perspective, concentrates investments on low-polluting businesses that may provide a higher return on investment. Whether or not such a change materialises will depend on several factors that are outside the purview of tax policy, such as the price of commercialisation of fossil fuels, the level of investment needed for diversification, and the comparative rates of return of the different businesses.

3. OBTAINING PROGRESSIVITY

As mentioned, when discussing environmental taxation, progressivity is not factored based upon the operation of the instrument alone. An indirect tax instrument such as a carbon tax is not designed to be progressive. Its purpose is to assign a direct cost to every additional tonne of carbon released into the atmosphere as a result of the consumption of fossil fuel and energy products.

Pigouvian taxes like carbon taxes are geared towards the moulding of a behaviour. Taxes that are similar to a carbon tax are sugar taxes, tobacco taxes, and alcohol taxes. What they have in common is the intent to curb a behaviour in the furtherance of a higher public good, which in this case might be health (better air quality) or the environment (through the reduction of carbon emissions). As such, the success of carbon taxes (and Pigouvian taxes in general) can in theory be measured by the *ceteris paribus* decrease of proceeds of the tax, as lower proceeds equal an increase of targeted behaviours.[10]

Economies depend on the consumption of energy products for the furtherance of economic activity, and this activity is important for the wellbeing of societies and individuals. Modern society, as it stands today, relies on carbon-intensive fuel sources to function and prosper. Therefore, the pricing of carbon as a proxy for energy taxation cannot lead to a prohibitive energy price until society is capable of developing an equally dependable energy substitute to foster all of the activities to which modern society has grown accustomed.

There are many theories that seek to define the optimal price of carbon (OECD 2018). Setting a carbon tax rate is no simple exercise, and the results are often contested.[11] Ultimately, the price should be one that the particular country (and society) is able to sustain, considering the level of economic development (World Bank n.a.) and the Intergovernmental Panel on Climate Change (IPCC) targets to reach the goals set by the Paris Agreement.[12]

Progressivity can be achieved through compensatory redistribution of funds to the low-income groups of society through the country's general expenditure budget. Doing so through the general expenditure process means that redistribution will be unaffected by a corresponding reduction in revenue accumulation via the carbon tax, even if part of the redistributed cash is composed of the proceeds of the tax.[13] The only factor impacting an increase or decrease in the expenditure line that informs redistribution is the relative price of the fossil fuel or energy product. In this sense, redistributive measures ought to sunset as low-carbon fuels and renewable energy sources become more available and affordable, due to those measures' stimulation of a shift in consumption patterns and acceleration of the energy transition process.

Redistributive measures could take several different forms, including (i) cash back redistribution, (ii) energy tariff differentiation according to a particular group's geographic location,[14] and (iii) corresponding reductions to other taxes, including to income taxes (see Section 4.4)[15] For those who receive some form of compensation or redistributive measure on account of the imposition of a carbon tax, the carbon tax rate (or carbon price) is automatically reduced in proportion to the

10 In practice, many factors, which may be difficult to disaggregate, influence behavioural change; thus, trends in tax revenue are not necessarily an indication of the effectiveness of an environmental tax but may be the result of many factors, e.g. other policy instruments and global price fluctuations.

11 For an overview of approaches to setting the environmental tax rate, see Section 4.2.

12 According to the IPCC, '(m)odelling studies, consistent with stabilization at around 550 ppm CO_2-eq by 2100, show carbon prices rising to 20 to 80 US$/t$CO_2$-eq by 2030 and 30 to 155 US$/t$CO_2$-eq by 2050. For the same stabilization level, studies since TAR [the IPCC Third Assessment Report] that take into account induced technological change lower these price ranges to 5 to 65 US$/t$CO_2$-eq in 2030 and 15 to 130 US$/t$CO_2$-eq in 2050' (see IPCC 2007, p. 19).

13 Countries will independently decide whether to earmark the revenues. There is a lively debate on whether earmarking carbon tax revenues is desirable tax policy, but that is beyond the scope of this paper. For more on this topic, see Falcão (2019a), p. 227.

14 For example, when low-income households are located in a particular region or neighborhood, the country can establish a tax or tariff differentiation according to the location of the payor, as has been instituted in Colombia.

15 It is conceded, however, that even if redistributive policies are effective at conferring progressivity towards the implementation of carbon taxes, they often do little to instil political support for carbon tax implementation (see Harrison et al. 2022).

amount of the redistribution. This type of measure has the impact of creating different tiers of carbon taxation (or energy pricing) in the country without bringing complexity to the operation of the tax system as a whole. Ideally, these redistributive measures would be phased out over time as renewable fuel sources become more available and their purchase price becomes cheaper.

Supplementary policies to stir the energy transition process are therefore also key to the advancement of the climate agenda. A new revenue-raising source, like a carbon tax, is instrumental in that it makes available additional resources with which a country can invest in the development of new technology and build new distribution networks based on the renewable energy source of choice.

4. KEY DESIGN CONSIDERATIONS FOR FAIR ENVIRONMENTAL TAXES

4.1. Regressivity Versus Progressivity: Does It Matter?

Perhaps the single most important obstacle to environmental taxation is a collection of concerns pertaining to negative equity impacts and regressivity. Yet, in LMICs, negative equity impacts are not necessarily linked to the regressivity or progressivity of a tax but to the absolute impacts of price changes on the incomes of the poorest and most vulnerable households (see Steckel 2021, Dorband et al. 2019, Keen 2024, Cottrell and Falcão 2018). Thus, the central question for policymakers is how to obtain meaningful progressivity through a combination of tax and expenditure measures. Below, we explore how this might be done in practice.

It is important to acknowledge that there is considerable divergence among the distributional impacts of environmental taxes across countries and policies. In some contexts, environmental taxes may even have progressive distributional impacts, particularly in the energy and transport sectors. In general, evidence shows that the more inequitable the country, the higher the potential for environmental taxes to have progressive outcomes.

- In countries where electrification rates are relatively low, or where energy-consuming durable goods are beyond the reach of poor households, carbon taxes and environmental taxes on stationary uses of energy are often found to be progressive (see e.g. Dorband et al. 2019, Liu 2013, Ohlendorf et al. 2021, Pizer and Sexton 2017, Steckel et al. 2021).
- In countries with low levels of vehicle ownership among lower-income deciles, environmental and environmentally related taxes on transport fuels and private vehicles – such as taxes on vehicle purchase and circulation taxes – have been found to act as 'luxury' taxes with progressive impacts (Granger et al. 2021, Morris and Sterner 2013, Flues and Dender 2017, Cespedes 2015).

However, in such cases, as incomes rise and access to energy and private transport increases, relatively more significant and regressive impacts on low-income households can be expected. Moreover, even in those countries where impacts are progressive overall, effective welfare losses may be substantial in the absence of measures that offset that impact.

In prior sections, we have elaborated on the necessity for an environmental or carbon tax rate to be sufficiently high if it is to bring about behavioural change. To allow for this eventuality, it is essential that the volume of compensation designated in the expenditure process be sufficient to mitigate regressive impacts and so permit the implementation of fair, environmentally effective taxes (i.e. taxes with a rate commensurate to the realisation of environmental improvement, such as the achievement of the Paris climate targets). The implications of this necessity are discussed in the next section.

4.2. The Implications of Environmental Effectiveness for Fairness and Tax Justice

There are two approaches to setting the rate of an environmental tax. Pigouvian taxes, conceptualised by economist Alfred Pigou in 1932, are set at a level that internalises all external environmental costs within the price of a polluting good or service. The 'standards and pricing procedure' proposed by Baumol and Oates in 1988 sets an environmental tax rate at a level (price) that can be expected to deliver a particular environmental standard. Both may indicate that a high tax rate is necessary to achieve environmental objectives.

A common response to this problem is to introduce a tax at a rate that is too low to bring about environmental improvement. Many countries have implemented carbon tax rates that are significantly lower than the carbon prices required to drive down GHG emissions in line with the Paris Agreement, estimated at USD 40–80/tCO_2 by 2020 and USD 50–100/tCO_2 by 2030 by the Carbon Pricing Leadership Coalition (2017). Most middle-income countries apply a carbon tax average of roughly USD 5.50 per tonne of CO_2/eq (Falcão 2021a, p. 775). Very low carbon tax rates tend to be absorbed by industry and are not passed down to the consumer

as an additional price increase on the consumption of energy products, thereby failing to achieve the behavioural change expected from the imposition of carbon taxes. Low carbon tax rates therefore perpetuate business as usual scenarios despite the presence of the carbon tax and delay the energy transition process (Falcão 2024c).

Similarly, low taxes on environmental pollutants do not inspire change. In Nepal, the pollution control tax of €0.01/litre of gasoline and diesel – less than 1% of the fuel price – is far too low to drive down air pollution. In Guyana, the tax rate of an environmental levy on non-returnable beverage containers was set at €0.05 per container in 1995; this rate has not been increased since, leading to a drop in the value of the tax in real terms due to inflation (for details, see Cottrell et al. 2023). There are methods by which countries can overcome this problem, such as by introducing a tax at a low rate initially, then progressively increasing the tax rate (a so-called tax escalator). Box 2 examines the carbon tax escalator that was designed in South Africa to address this challenge.

Tax justice is not served by introducing an environmental tax at a rate too low to bring about a change in behaviour. Instead, such an approach perpetuates inequalities of exposure to environmental degradation and penalises the poorest and most vulnerable, who are the most affected and the least able to respond. Thus, in failing to implement the polluter pays principle (PPP) – which has been explicitly identified as a key tool for the delivery of environmental objectives in a fair manner by the European Court of Auditors – a low tax rate does not meet the fairness criterion (European Court of Auditors 2021). Moreover, given that inequality of contributions to the climate crisis are very substantial – the top 10% of emitters are responsible for almost half of all global carbon emissions – failure to implement the PPP can also be equated with a failure to address inequality of contributions to pollution (Chancel et al. 2023).

On a national level, the response to these challenges to fairness and tax justice is the introduction of an environmental tax at a rate commensurate with environmental effectiveness, alongside social mitigation and compensation instruments that are fit for purpose within a progressive fiscal system. Internationally, aligning the PPP with the principle of common but differentiated responsibilities calls for the redistribution of revenue to those countries most impacted by climate

BOX 2: THE CARBON TAX ESCALATOR IN SOUTH AFRICA

At the time of its introduction in 2019, the carbon tax rate in the Republic of South Africa was around USD 6/tCO_2e. By 2024, the rate had gradually increased by means of a tax rate escalator to USD 11/tCO_2e. Initially, it was envisaged that the rate would increase by at least USD 1 annually to reach USD 20/tCO_2e by 2026, USD 30/tCO_2e by 2030, and USD 120/tCO_2e beyond 2050. However, the pace of change has slowed in recent years due to a number of factors, most notably the economic situation in the country following the Coronavirus pandemic (Cottrell et al. 2023).

In South Africa, several protective measures were put in place to shield a wide range of stakeholders from the impacts of the tax. These included tax allowances and exemptions that reduced the actual carbon rate to 60–95% less than the full rate, depending on the type of emitter and the tax base. Tax-free allowances were introduced to protect energy-intensive sectors, such as mining, iron, and steel. Eskom, South Africa's primary electricity provider, was excluded from the first phase of the carbon tax. This protected consumers from electricity price increases, as did cross-subsidies in the power sector, which financed lifeline tariffs (free electricity) for the poorest households in some provinces. However, both measures are low on the social mitigation hierarchy (see Section 4.4) – particularly the former, which is an untargeted subsidy.

A tax escalator like the South African approach is one possible strategy to address the problem discussed in Section 4.3, assuming political commitment to regular increases to the tax rate. Although environmental effectiveness will not be achieved in the short term, the escalator gives economic actors time to adjust and establish effective welfare measures – and to roll out substitutions – while creating a dynamic incentive in favour of emissions reductions. In the long term, the tax rate can be increased and environmental objectives can be met.

change to finance climate change adaptation and resilience and to compensate for loss and damage 'in a spirit of global partnership'.[16]

The remainder of Section 4 focuses on designing environmental taxes. Section 4.3 looks at how to predict equity impacts, and Sections 4.4 and 4.5 explain how the design of environmental taxes and accompanying expenditures can effectively mitigate those impacts. Section 4.6 discusses designing environmental taxes as 'luxury taxes'.

4.3. Predicting Impacts

A deep understanding of the socioeconomic context should inform the design of mitigation measures, as the most appropriate mechanisms are highly dependent on the availability and price of less polluting alternatives, social inequalities, consumption patterns, household expenditures, existing welfare mechanisms, and the importance of specific economic sectors, particularly for low earners (Cottrell et al. 2017).

Ideally, policymakers should implement an in-depth social impact assessment (SIA) to predict the impacts of environmental taxes and take into consideration a wide range of intersecting dimensions of inequality, e.g. urban and rural low-income households, subsistence farmers, female-headed households, women, the elderly, children, indigenous people, and local communities. Where possible, policymakers should use criteria beyond income to determine household vulnerability, such as household composition (OECD 2022a). SIAs should seek to predict the multiple positive and negative impacts of environmental taxes, not only on prices but also on access to goods and services, employment and subsistence, institutions and standards, rights and power, and assets (Raworth et al. 2014). These findings should inform the design of measures to mitigate negative impacts on vulnerable groups.

When predicting the impacts of environmental taxes on social equity, direct price increases are not the only factor that should be considered. Taxes may also have indirect impacts on commodity and product prices. If price increases are passed through, energy and fuel price increases can result in higher prices for food and other basic commodities. These impacts are hard to predict and may vary depending on the consumption baskets of poor households and on the ability of citizens to substitute for greener alternatives, as well as on households' direct and indirect sensitivity to changing transport, energy, or commodity costs. The urban poor, who are generally most dependent on goods transported from elsewhere for their basic needs, are likely to be most vulnerable to such effects (see Fay et al. 2015). As a high proportion of the income of poor households is spent on food, energy, and fuel, indirect effects should be monitored carefully and compensated for where necessary.

When predicting impacts, it is also important to consider behavioural responses over time. Some impacts may be temporary, others permanent. However, the bulk of studies on the distributional impact of environmental taxes approach the issue from a static perspective (see e.g. Kosonen 2012, Steckel et al. 2021). Price elasticity of demand[17] tends to be higher in the long term than in the short term, implying that actors will respond differently to price changes as time passes. In the short term, economic actors will adjust their behaviour to adapt to higher prices; over time, they will make sustainable investments and structural changes to their way of life (OECD 2010). As we argued in *A Climate of Fairness*, this tendency to ignore the temporal dimension is a significant oversight.

Overcoming a static interpretation of the impacts of a measure requires a review of policies on a recurrent basis – possibly every five years, at the same pace as countries are eligible to submit a new stocktake under the Paris Agreement. At that time, it is also necessary for policymakers to review the carbon tax rate or pricing measure (to align it with the stocktake goal) and rethink redistributive policies so that these are commensurate with the level of taxation or pricing implemented at the country level (Falcão 2024c).

4.4. Integrated Approaches to Mitigating Equity Impacts

In spite of perceptions of trade-offs between environmental and social welfare policies, particularly but not only in LMICs, a large body of evidence shows that climate change, inequality, and poverty are inextricably linked and that solving these challenges cannot be

16 See Cottrell and Falcão (2018) for a detailed explanation of policy principles relevant to environmental taxation and tax justice.

17 Price elasticity of demand refers to the degree to which demand is responsive to price change.

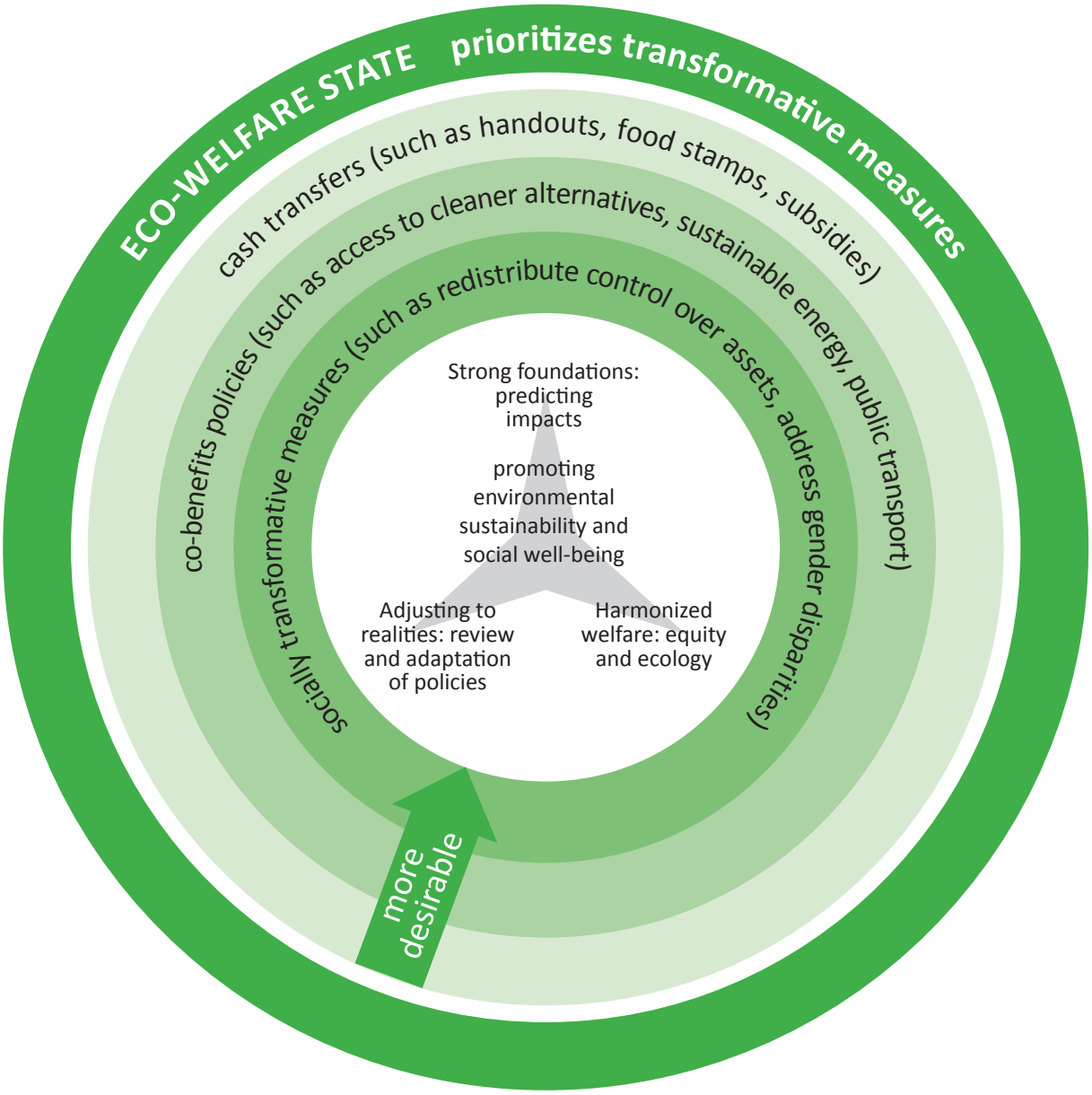

Figure 3: Mitigation of negative equity impacts

achieved in isolation (see e.g. World Bank 2020). Integrated solutions should thus be sought where possible.

The most integrated and holistic solution is probably the reconceptualisation of the social welfare state as an eco-welfare state. An eco-welfare state is a 'political and economic system in which the government simultaneously prioritises environmental protection and citizen well-being [and] emphasises harmonised policies and programmes that promote environmental sustainability and social well-being with particular attention to climate change mitigation and adaptation measures as well as social protection and investment for the people' (Hasanaj 2023, p. 46). This approach has a great deal of appeal to those seeking to align environmental objectives with equity and fairness because by definition, an eco-welfare state will set out to deliver benefits related to poverty, inequality, and wellbeing while mitigating environmental and climate risks. An eco-welfare state would aim to mitigate negative equity impacts associated with, for example, a high carbon tax.

In LMICs, where a social welfare state may not yet have been established and where the livelihoods of many residents are dependent on natural capital, governments should focus their efforts on the introduction of measures that address social vulnerabilities while prioritising environmental protection and resilience to climate change. In these countries, earmarking environmental tax revenue for climate change resilience and

BOX 3: THE IACV IN PERU: TAX DESIGN TO MITIGATE POSSIBLE REGRESSIVE IMPACTS

In Peru, an environmental tax on vehicle pollution (the IACV) was in place from 2012–2019 to create incentives for the purchase of cleaner vehicles. The tax rate was governed by two components, engine capacity and vehicle age. Several components of the design aimed to prevent potential regressive impacts:

- 'Luxury' vehicles were taxed at higher rates
- Overall tax burden was not permitted to exceed 40% of vehicle value
- Vehicles with an engine capacity of less than 1,500 cubic centimetres were not liable
- Vehicles more than 5 years old, vehicles for senior citizens and people with disabilities, public transport vehicles, taxis, ambulances, and mobile hospitals received an 80% tax reduction from 2012 to 2014, a 50% reduction from 2015 to 2018, and a 0% reduction in 2019 (Almeida 2016a, Almeida 2016b, Páez et al. 2022)

The tax appears to have been slightly progressive for the poorest 28% of the population while the tax reductions remained in place (Almeida 2016b). The tax was repealed in 2019, despite many experts contending that it was environmentally effective (Páez et al. 2022).

BOX 4: THE PHILIPPINES: COAL AND COKE EXCISE

Similar to South Africa, the Philippines has introduced a tax escalator on coal and coke excise. The initial tax rate was too low to reduce emissions or have significant equity impacts – indeed, modelling predicted that the tax would account for just 0.01% of household income by 2020, when the rate increased to an effective carbon rate of USD 1.73/tCO_2e (Cottrell et al. 2023).

However, the tax was introduced as one element within a broader tax reform expected to have regressive distributional impacts. Some planned mitigation measures, including fare discounts for public transport, were never implemented. Such a failure risks undermining trust in government and future efforts to secure progressivity in the fiscal system using expenditures alongside a high carbon or environmental tax.

environmental protection can magnify the positive outcomes of such measures.

Parallels can be drawn between the integration of social welfare and environmental protection in the eco-welfare state and the hierarchy of social mitigation measures to secure social justice in green economies developed by Raworth et al. (2014). The authors consider socially transformative policies to be the most desirable form of welfare, e.g. redistributing control over assets, addressing gender or ethnic disparities, or securing rights for marginalised groups. Co-benefits policies come second, particularly those that deliver win-win outcomes for green economy transition, e.g. improving access to sustainable energy or public transport, schemes to replace dirty technologies with cleaner alternatives, or subsidies for low-carbon housing or utilities. By expediting behavioural change and contributing to the achievement of environmental objectives, both have been shown to reduce the overall cost of environmental improvement. Raworth et al. (2014) rank lowest safeguarding measures to protect the vulnerable from negative impacts associated with changing relative prices due to environmental taxation, e.g. cash transfers, handouts, food stamps, or subsidies. Nonetheless, such measures can play an important role in enhancing climate resilience and mitigating the negative impacts of climate events (see Chancel et al. 2023, pp. 123–124).

Ideally, mitigation measures should not undermine the incentive effect of environmental taxes but should indirectly compensate low-income households wherever possible. If this is not possible, lifeline tariffs – provision of a certain proportion of household energy or water supply at low or zero cost – can be introduced. In South Africa, poor households receive a monthly allocation of free electricity that is effectively cross-subsidised by wealthier households through progressive tariffs (Kruyshaar 2017).

Targeting can draw on existing databases and digital infrastructure that links governments to poorer citizens where such systems exist. In Indonesia, a smart card system to access a range of social benefits has been

in place since 2015 and has the potential to be used to mitigate negative equity impacts due to carbon or other forms of environmental taxation. The COVID-19 pandemic tested many innovative approaches to social welfare; for example, in India funds were transferred to poor citizens' bank accounts using an ID system, and in Peru previously identified poor households could receive cash transfers. Lower-tech options drew on information from local governance structures. In Kenya, for example, village leaders reported on household welfare, while in Rwanda local structures provided information on how to target in-kind food security packages (see Gerard et al. 2020).

In some LMICs where targeting compensation is challenging and design cannot provide a solution, policymakers may have to accept trade-offs between equity and environmental effectiveness, e.g. transitional low tax rates for the diesel used by low-income fishers and family agricultural producers or kerosene subsidies for light and cooking in lower-income households (Cottrell and Falcão 2018).

4.5. Environmental Taxation and Gender

Very little research has been published on the gender-differentiated impacts of environmental taxation. The first edition of *A Climate of Fairness* includes a summary of the literature (pp. 58–61 for our findings) and concludes that stationary energy taxes – or taxes, fees, and charges on domestic utilities – tend to have negative distributional impacts on women because they tend to spend more on household budgets, while transport taxes (including fuel taxation) tend to have positive distributional impacts. The summary finds that impacts of environmental taxation attributable to the socio-economic roles of men and women are generally positive, e.g. shifts to cleaner fuels and improved energy access reduce the time needed for gathering fuel and free women to take on paid work.

A common finding of more recent research is that women tend to bear a disproportionate burden of indirect taxes, such as value-added tax (VAT), consumption taxes, user charges, and user fees – many of which are environmental taxes or at least environmentally related – because women are disproportionately represented among low-income earners (Lahey 2018, Coelho et al. 2022, Joshi et al. 2020, Joshi et al. 2024, OECD 2022, Oxfam 2019). If user fees are for public goods, like water, this can also place a disproportionate burden on women due to their unpaid caring responsibilities (Joshi et al. 2024).

In general, an excise tax introduced to address externalities might result in a higher burden for a certain gender, meaning that one gender subsidises the undesirable consumption behaviour of the other. However, if external costs are internalised and consumers bear the *true cost* of a good or service, then differences in consumption patterns across genders – and therefore in the tax burden – do not constitute bias, as the distribution fairly reflects the undesirable behaviour of the consumer (Coelho et al. 2022). In such a case, 'gender-based differences in taxation might also be entirely justified by policy objectives relating to health or the environment' (Grown and Mascagni 2024, p. 4). This conclusion is applicable to environmental taxation; the tax burden reflects the relative contribution of polluters to an environmental problem, which is clearly aligned with notions of fairness and the PPP (see Section 4.2).

Until recently, the concept of explicit and implicit bias has been used as an analytical framework to understand gender bias and taxation.[18] Explicit gender bias is becoming increasingly rare, although some examples still exist, e.g. lower tax rates on female owners of property, a bias in favour of women, or allocation of tax credits to male heads of households, a bias in favour of men (Joshi et al. 2024). In many countries, lone-parent households receive different tax reliefs, regardless of gender, such as annual personal income tax reliefs in Ghana for individuals with dependents.

Nonetheless, Grown and Mascagni (2024) point out that a focus on explicit and implicit bias creates conceptual confusion and has limited relevance for tax reform. Tackling implicit biases has unclear implications for tax policy, as the causes of these biases relate to the basic disadvantages of women participating in the economic sphere and not to the tax as such. As a result, implicit biases cannot generally be fixed through tax reform alone but call for far-reaching, progressive reform of

18 In the former case, women and men are treated differently by the tax system, e.g. a tax that is levied only on women; implicit bias stems from the interaction of a tax with underlying economic characteristics or behaviours of women and men, such as income levels, consumption, property ownership, savings, entrepreneurship, tax morale, unpaid care burden, or compliance (OECD 2022).

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the fiscal system and efforts to tackle the structural inequities that reinforce gender inequality.

Finally, Joshi et al. (2024) contend that any assessment of gender and taxation must consider revenue and expenditure together, i.e. not only the burden of an indirect tax such as an environmental tax but also its contribution to government spending and social welfare. This is in a similar vein to the arguments in Sections 3 and 4.2 that question the weight that should be attributed to the regressivity or progressivity of environmental taxes when the impacts of the tax and related expenditure on social equity, and the progressivity of the fiscal system as a whole, are ultimately more decisive.

4.6. Environmental Taxes Acting as Luxury Taxes

As noted in the introduction, there is a strong link between wealth and climate change. The wealthiest people on the planet tend to pollute the most because they both consume more energy products and are able to access more energy-intensive products (Chancel et al. 2023, Tax Justice Network 2022). A specific carbon tax implements the PPP, as it levies a tax per unit of carbon emitted – those who consume more carbon-intensive products will automatically pay more carbon tax. Such a tax is therefore capable of directly tackling energy overconsumption by wealthy individuals in a much more proportionate manner than a direct tax on profits ever would. For example, a carbon tax would be capable of capturing the rent associated with the use of air conditioning by affluent populations, the heating of large spaces, air transport, cruising activities, and, in extreme cases, attach a price tag to airspace travel by the richest 1% on the globe.

Some contend that a carbon tax cannot capture the rent associated with passive investments made in industries that are known to be highly polluting (such as mines and oil and gas ventures). Here, the counterargument is that these rents would (and should) already be captured under the income tax system as investment income or profit. Assuming that the country where the activity takes place has a significant carbon tax or price,

the polluting behaviour of that enterprise will already have been captured by the indirect tax system of the country. Therefore, taxing ownership or investment in such industry would in fact lead to a double taxation of the same emissions because these emissions will already have been priced and captured by the carbon tax imposed at the domestic level. In this sense, coordination or price increasees due to heightened levels of taxation imposed by the country of residence of the investor can only be achieved through some level of international agreement, such as a treaty on carbon taxation, or price coordination.[19]

The common argument from a development perspective is that the lower the level of income in the country, the more progressive the tax, as a carbon tax tends to impact the richer segments of society more (see Section 4.1). Indeed, in some countries a carbon tax can be a true representation of a wealth tax – with several caveats, as explored below.

In many countries wealthier households spend by far the largest share of their budgets on motorised transportation. For example, in Ghana and Rwanda, car ownership and petrol and diesel consumption are strongly concentrated in the wealthiest income groups (Granger et al. 2021). Similarly, Morris and Sterner (2013) found that fuel taxes were strongly progressive in many African and large Asian countries, as well as in Turkey, Chile, Mexico, Costa Rica, and Brazil. In such cases, the consumption of fossil energy products and passenger vehicles is a prerogative of wealthier income groups.

However, caution should be exercised in assuming that there will be no regressive impacts on low-income citizens and households in the case of fuel taxation: even minor increases in fuel prices can have a negative impact on the disposable incomes of the poorest, and higher fuel prices may affect food prices and thus food security. Taxing some fossil fuels in LMICs – such as kerosene or natural gas – without ensuring that substitutions are available can result in increased use of biomass for cooking, leading to higher levels of air pollution and severe impacts on human health. This is a significant source of GHG emissions: in Sub-Saharan Africa, solid fuel cooking accounts for 1.2% of global CO_2 emissions and 6% of global black carbon (see Koscielniak 2023).

On the other hand, environmental taxes levied on vehicle purchases and circulation are more likely to act as luxury taxes. An example of this is banded purchase taxes on new vehicles, which are designed to increase in line with average carbon emissions per kilometre driven. Poorer citizens in LMICs are not in a position to purchase a new vehicle and will be largely unaffected by such a tax.

In Indonesia, for example, a 'luxury tax' has been levied on vehicle purchases since 2009. The tax was greened in 2013 and rebranded the 'Low Cost Green Car' (LCGC) policy, which zero-rated smaller, more efficient vehicles while retaining high levels of tax on luxury vehicles. Total car sales fell between 2013 and 2019, and the proportion of LCGC sales increased significantly (UNEP 2019).

In middle- and high-income countries where fossil fuel consumption is a given and energy consumption levels are higher, capturing the consumption of high net worth individuals can be achieved by targeting activities that are typical of that class, such as frequent flying.

A common example of a luxury environmental tax is a tax on aviation. While international agreements prevent aviation fuel for international flights from being taxed, taxes can be levied on air tickets, passengers, or flights (Falcão 2021b). Such taxes are in place in many LMICs, including Ghana, Indonesia, Malaysia, and the Caribbean islands. Aviation taxes can also be designed to be progressive. For example, they can tax frequent flyers at a progressively higher rate. The International Council on Clean Transportation (ICCT) estimated that a Frequent Flyer Levy – ranging from USD 9 for a person's 2nd flight to USD 177 for their 20th – would raise around 98% of its revenue from the world's wealthiest 20% (Zheng and Rutherford 2022).

19 See Falcão 2024c and Falcão 2024d; see also the International Monetary Fund's proposal for a Carbon Price Floor (IMF 2021) and, for completion purposes, the G7 proposal that was supposed to be a cooperative agreement and eventually got converted into the current OECD Forum on Climate Mitigation approaches (G7 2022).

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5. SAFEGUARDING JUSTICE

5.1. Climate Justice and Tax Justice

Deeply connected with the progressivity argument is the issue of fairness, equity, or justice in the tax framework. As mentioned, domestic equity can be safeguarded through redistributive and compensatory measures. The same is not true when it comes to the assessment of equity in the distribution of (i) impacts associated with climate change and (ii) exposure to the harmful effects of carbon-based pollution.

In most countries already suffering from the impacts of climate change, the burden is most severely felt by those in the lowest tiers of society. These populations also generally make use of the most carbon-intensive fuel, as these tend to be the cheapest sources of fossil fuel (coal, diesel, and biomass).

Regarding the harmful impact on health of consuming carbon-intensive products (and potentially breathing fumes on a daily basis), the carbon tax produces quite an equitable result. By increasing the relative prices of fossil fuels according to their carbon intensity, the economic system is one that would (if optimal) expose the low-income class within society to the least carbon-intensive products. Justice can therefore also be perceived to mean the ability to have access to energy that is affordable and (if not clean) low in carbon. Shifting the way one thinks about justice so that it concerns not just tax justice but also climate justice can be an important step towards allowing low-income households that have the least access to health treatment and products a chance to safeguard their health through access to clean air, water, and soil.

5.2. Border Carbon Adjustment

When it comes to safeguarding cross-border equity between countries, a dominant topic is the recent proliferation of border carbon adjustment (BCA) measures.

For context, a BCA is a price applied at a border with the aim of equalising the price of an imported good with that of the same good manufactured in the domestic market. It can also be applied to an export operation, and in that case the border adjustment takes the form of a credit. That is, the country credits back the tax (or price) employed domestically so that the cost basis of the product is similar to that of other products manufactured elsewhere.

From an environmental perspective, BCAs can apply to a carbon tax or a price administered under an emissions trading scheme (ETS) where 100% of the permits are auctioned. For the BCA instrument to be legal under the rules of the General Agreement on Trade and Tariffs (GATT), the price applied at the border has to match the price applied at the domestic level to ensure that it does not disproportionately burden the imported product (see Falcão 2021c, p. 41).

There are two ways that countries can respond to the imposition of a BCA measure. First, countries can choose to introduce an explicit pricing instrument at the domestic level that guarantees that the revenues from carbon emissions generation will not be taxed elsewhere but will instead be retained within the exporting country. This is essentially what the BCA assumes such countries will do. Opposition to the tax can be expected to be less concerted than in the absence of a BCA, as the exporting businesses would have to pay a carbon price in either case. This approach renders a broader carbon tax more attractive than it was in the absence of the CBAM because the losses from the unilateral adoption of a carbon tax become irrevocable once a BCA is imposed, and potential benefits from revenue loom larger as a result (Keen 2024).

Tax justice advocates tend to oppose BCAs – and the CBAM – because they are inequitable, incompatible with climate fairness, and at odds with the principle of common but differentiated responsibility articulated in the United Nations Framework Convention on Climate Change (UNFCCC) and reiterated in the Paris Agreement (see e.g. Marger and Chaparro 2023, Oxfam 2021, UNCTAD 2021). Such advocates contend that BCA standards are designed by one country and imposed on its trading partners, compelling the recipients of such policies (which tend to be less affluent than the imposing jurisdiction) to comply with standards that they neither helped create nor were consulted on.

The retention of CBAM revenue within the EU, rather than its use to finance climate action in low-income countries, has been widely criticised (see e.g. Oxfam

BOX 5: THE EU CARBON BORDER ADJUSTMENT MECHANISM

The Carbon Border Adjustment Mechanism (CBAM; Falcão and Englisch, 2021) imposed by the European Union (EU) is the only BCA instrument imposed for environmental purposes that is so far in force.*) The EU CBAM is only applicable at the import level on direct emissions; the price is applied in respect to the domestic EU ETS, and only allows compensation against an explicit carbon price. Therefore, trading partners who wish to avoid a border measure when exporting to the EU would need to enforce a carbon tax or ETS for the sectors initially covered by the EU CBAM: cement, aluminium, fertilisers, electric energy production, iron and steel, and hydrogen. If the country of origin of the product has an explicit price in force, the EU will recognise that price and only charge the difference between the price applied in the country of origin and the price applied at the border. Pre-empting the application of the CBAM through the administration of a separate measure in the country of origin is currently the only circumstance in which the exporting country gets to keep part of the proceeds from the application of the CBAM.

*) Many other countries are, however, considering the implementation of BCA measures. For example, the United Kingdom announced that a BCA measure would be introduced in 2025 (Factsheet: UK Carbon Border Adjustment Mechanism- GOV.UK, www.gov.uk). Australia launched an open consultation on a potential BCA measure in the summer of 2023 (Carbon Leakage Review- Australian Hydrogen Council, h2council.com.au). Canada held a consultation process in 2021 (Exploring Border Carbon Adjustments for Canada, Canada.ca). Japan included a discussion on the admission of a BCA-type measure as part of its 2020 Green Growth Strategy, and the United States has a pending Congressional Bill concerning the potential introduction of a BCA-type measure (see e.g. 4 New Carbon Border Adjustment Bills in the US, World Resources Institute, wri.org; see also United Nations 2024).

2021, UNCTAD 2021). European institutions like the European Parliament Committee on Environment, Public Health and Food Safety have issued statements calling for revenue at least equivalent to revenue generated by the sale of CBAM certificates to be used to support least developed countries in decarbonising their manufacturing industries (European Parliament 2022). It is important that this revenue be used in addition to existing climate finance; it does not replace other sources (Oxfam 2021).

Exempting least developed countries has also been proposed to prevent negative impacts on the poorest countries (Oxfam 2021). Augmenting the CBAM to incorporate fairness considerations might take the edge off equity and fairness concerns and temper fierce opposition to the measure in the Global South.

A second and more environmentally effective option for countries would be to adhere to a multilateral carbon tax system that allows countries different tiers of taxation, according to their level of economic development, and forestalls the application of a BCA towards a treaty member. This latter option puts countries on a more equal footing when it comes to the negotiation of the terms and conditions of the agreement, definition of the tax base, and imposition of the tax rate. It also puts countries at the same level of environmental protection, even if the carbon tax is applied at different rates, because middle- and low-income countries are protected by the principle of common but differentiated responsibilities recognised by international environmental law (Falcão 2024d). Assuming global reach and broad coverage, a multilateral carbon tax system would render BCAs superfluous.

Both options require some level of adaptation. Options that are not on the menu, as they are not equitable, include refuting the climate problem, claiming that developing countries should not be made to respond to the climate crisis because of the historic responsibilities of developed countries, and advocating for the right of inertia.

The second was the option adopted in 1997 under the Kyoto Protocol (United Nations 1997), which required only the developed countries of the time (Annex I countries) to introduce mitigation measures (Falcão 2019b). The result, history will tell, was global inertia because even the countries that were required to act were concerned with the loss of competitiveness of their products in international markets. This concern led to a low level of ambition and to the magnification of the climate problem – to the point where only quite stringent levels of global carbon prices, administered globally, will now allow us to meet the temperature target contained in the Paris Agreement.

Equity and justice in LMICs cannot be achieved via country inertia that is centred on economic prosperity ideals premised on the consumption of fossil fuel products, not least because their populations will be the first to feel the impact of the increase in temperature. These will, in turn, be the countries with the least resources to respond to the climate crisis.

Achieving a globally equitable result therefore means putting all countries on equal footing in terms of knowledge, data, and the resources necessary to respond to the climate crisis while it is still at a stage where it is not catastrophic. Equitable environmental policy should enable countries to make informed decisions about how to deal with each and every situation and give them more bargaining power to negotiate positions in international forums like the UNFCCC's Conference of the Parties (COP), the biodiversity COP, and others.

6. CONCLUSIONS AND RECOMMENDATIONS

A holistic approach to assessing the progressivity of the fiscal regime safeguards equity, both in terms of the ability to pay and in terms of the progressivity of the burden of tax felt by different income groups in society, while also preserving the positive environmental impact of a carbon tax or other environmental tax instrument.

This is because, in such a regime, the different fossil fuel and energy sources are priced according to their carbon intensity, regardless of the final burden of tax imposed on the consumer. The economic incentive to consume the least carbon-intensive product thereby perpetuates in the value chain of a given fossil fuel product, irrespective of the burden of tax. The environmental effectiveness of the tax is safeguarded through the simple implementation of the tax instrument. As a result, the environmental cost of doing business is incorporated and paid by all businesses and individuals making use of carbon-intensive fuels.

If the carbon tax is applied at the upstream level, i.e. at the point of extraction or import of a fossil fuel product into the country, as is the best practice, the differentiated pricing system is capable of impacting both formal and informal economies. At this level, there is also no opportunity for tax planning or fraud because the tax rates are pro-rated according to fuel quality and are therefore easily assessed and verifiable.

All issues considered, a combination of tax- and expenditure-based policies is more effective than relying on the specific attributes of a particular instrument to preserve only theoretical purity in a policy that might not be as impactful or effective in rendering a positive environmental result.

In the public domain, there are many proposals for taxes that link wealth, capital accumulation, and climate change. As explained above, these are not levied on an environmental tax base and are not initially designed to bring about environmental improvement through carbon dioxide mitigation. As a result, such taxes, although progressive, will fail to make a direct correlation between the carbon intensity of a product and the price at which the product is ultimately commercialised, and they will thereby fail to deliver as efficiently on the climate and environmental objectives assigned under the countries' Nationally Determined Contributions.

Direct taxes levied on an economic activity that is known to be carbon intensive can, however, serve other purposes. Such taxes can raise revenue to help close the climate finance funding gap by, for example, taxing excessive profits in fossil fuel extractive industries or carbon-intensive investments or placing a higher burden on carbon-intensive businesses, including through targeted double taxation. Such instruments can also play an important role in redistributing the burden of taxation more equally and in financing a progressive and inclusive social and ecological welfare state.

A modern fiscal system should adopt holistic policy goals through the application of the best fiscal instruments for the purpose of the general policy design. Therefore, the combination of specific excise taxes on carbon and redistributive measures that compensate for the regressivity of the tax should be explored when designing a tax system that is capable of both inputting a base price on carbon and achieving an equitable result in the allocation of the tax burden. This is the only path that is consistent with a carbon mitigation approach.

Both the absence of a national carbon price and the lack of action regarding the allocation of a carbon cost are known to be regressive and gender biased. Such neglect will lead to a greater allocation of climate adverse effects and risks to low-income households, particularly to women.

Mitigating climate change in line with the social justice principles of fairness, equality, equity, tax justice, gender justice, and climate justice is the most significant challenge humanity has ever faced. Thus far, carbon taxes and other pricing schemes have not lived up to their promise of driving down carbon emissions at the necessary pace. This is mainly due to countries' concerted failures to employ fiscal instruments in a complementary and holistic manner with the intention of making them work for the achievement of a higher public environmental gain.

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8. APPENDIX

Environmental taxes were already the focus of Tatiana Falcão's and Jacqueline Cottrell's comprehensive VIDC study **'A Climate of Fairness: Environmental Taxation and Tax Justice in Developing Countries'** (2018). To give readers a chance to revisit the findings of this study, we enclose the Executive Summary as appendix.

The full study can be found at:
www.vidc.org/fileadmin/martina/studien/a_climate_of_fairness_cottrell_falcao_study_nov2018.pdf
https://shorturl.at/XbX10