



emissions are covered by operating CPIs, amounting to 11.86 GtCO<sub>2</sub>e.<sup>1</sup>

Carbon pricing instruments can be grouped into two main types: direct and indirect carbon pricing.

With direct carbon pricing, the price applied is directly proportional to the amount of GHG emissions generated by a good or service. The three main direct carbon pricing instruments are a carbon tax, an emissions trading system (ETS), and carbon crediting mechanisms.<sup>2</sup>

Although these are typically applied domestically, some direct carbon pricing mechanisms have been applied across borders. Beyond the EU ETS in Europe, some emissions trading systems in different countries have been linked, such as the cap-and-trade systems of California (the United States) and Quebec (Canada).<sup>3</sup> Europe, in response to the threat of carbon leakage, is implementing a Carbon Border Adjustment Mechanism (CBAM) to tax imported goods and selected precursors whose production is carbon-intensive and at most significant risk of carbon leakage.<sup>4</sup>

Indirect carbon pricing refers to instruments that change the price of products related to carbon emissions in ways that are not directly proportional to those emissions. These include fuel and commodity taxes which create a carbon price signal even though they are applied to address other socio-economic objectives, such as addressing air pollution or raising revenues for government projects. Subsidies on fossil fuels can also be considered indirect carbon pricing, providing a “negative” indirect carbon price signal and incentivizing higher consumption.<sup>5</sup>

The application of these two types of carbon pricing varies among countries. Direct carbon pricing mechanisms are more prevalent in high- and middle-income countries, while indirect carbon pricing schemes are found throughout, including in many developing countries. Some African countries, for example, have implemented indirect carbon prices through fuel tax and subsidy reforms.

Regardless of the type, CPIs ultimately influence production, consumption, and investment decisions. If designed and implemented properly, CPIs can lead to decisions that will yield positive socio-economic impacts. These positive impacts are briefly discussed in the next section.

#### **What are the positive impacts of carbon pricing?**

- ♦ **Carbon emission abatements.** GHG emission reductions brought on by carbon pricing will bring countries closer to their Paris Agreement goals.
- ♦ **Redirect innovation.** CPIs provide financial incentives to abandon carbon-intensive investments and opt for cleaner, less costly activities.

- ♦ **Decent job creation.** The growth of greener industries can give way to the creation of more decent jobs, offsetting the impact of the phaseout of carbon-intensive industries on the labor market.
- ♦ **Environmental and health benefits.** CPIs incentivize regulated entities to abandon carbon-intensive activities, which have also significantly contributed to local air and water pollution. Phasing out these activities can improve the health of surrounding communities.

Despite these positive impacts, CPIs also run the risk of negatively affecting consumers and households. The incorporation of just transition in the implementation of CPIs will be necessary to minimize these impacts on consumers.

### Just Transition

Like with many other climate actions, enabling CPI implementation to give way to an enduring, low-carbon, climate-resilient economy will require an economy-wide transformation. Such a transformation will require changes that can have negative socio-economic impacts, such as eliminating carbon-intensive economic jobs and related activities, resulting in loss of livelihoods. It is imperative that CPI implementation considers the need to address these impacts while uplifting communities from poverty and reducing overall existing inequalities.

The higher costs CPIs place on carbon-intensive economic activities will inevitably reach households as industry passes the costs on through higher prices. The extent to which these additional costs strain a consumer’s finances will depend on several factors, generally categorized as vertical or horizontal distributional impacts.

Impacts of CPIs will differ depending on income groups – vertical impacts – or on other factors like geographical distribution, urban/rural locations – horizontal impacts within income groups.<sup>6</sup> Carbon pricing tends to be regressive in developed countries, representing a larger percentage of the incomes of poorer households (Figure 1). Consumers in lower-income households are affected significantly more than those in higher-income households as their disposable income is expected to be severely compromised. In addition, their incomes are typically insufficient to opt for cleaner but more expensive technologies that would allow them to evade the additional costs of carbon pricing.

<sup>1</sup> World Bank. [Carbon Pricing Dashboard: Map & Data](#). (Accessed 11 May 2023.)

<sup>2</sup> The World Bank. 2022. [State and Trends of Carbon Pricing 2022](#).

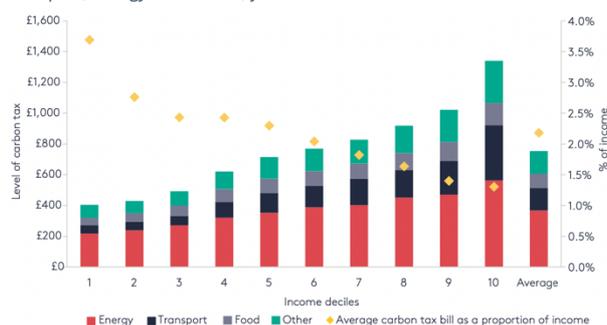
<sup>3</sup> California Air Resources Board. [Program Linkage](#).

<sup>4</sup> European Commission. [Carbon Border Adjustment Mechanism](#).

<sup>5</sup> Footnote 2

<sup>6</sup> Nature Sustainability. 2021. [Distributional impacts of carbon pricing in developing Asia](#).

Figure 1. Total carbon tax impact for each decile, split between food, transport, energy and others, for 2030 scenario.



Source: Grantham Research Institute on Climate Change and the Environment. 2020. [Distributive impacts of a carbon tax in the UK](#).

On the other hand, carbon pricing tends to be more progressive in developing countries. Higher-income households in developing countries are typically more likely to have access to and use fossil fuels and electricity. Since many low-income households tend to have less access to fossil fuels and electricity, they are less likely to be impacted by carbon pricing.<sup>7</sup>

Horizontal distributional impacts are impacts that are caused by different consumption patterns among households with similar incomes. Some of the common factors leading to different consumption patterns are as follows:

- ♦ **Housing capital.** Those living in more energy-efficient homes will spend much less on energy bills.
- ♦ **Transport capital.** Those with access to more fuel-efficient vehicles will spend much less on fuel.
- ♦ **Geography.** Compared with urban and suburban residents, residents in rural areas have a high demand for transport but have fewer alternatives, as public transport tends to be limited. Similarly, rural houses tend to be bigger, more exposed, and require more heating and electricity than urban homes.<sup>8</sup>

Implementing CPIs can therefore disproportionately impact certain communities, and potentially negatively affect their quality of life. Governments should take a just approach toward carrying out climate actions- this will ensure communities are not left behind as a country transitions towards a low-carbon, climate-resilient economy.

The concept of a just transition in climate action is not new. In 2015, the Paris Agreement called upon its signatories to take into account “the imperatives of a just transition of the workforce and the creation of decent work and quality jobs, in accordance with nationally defined development priorities.”<sup>9</sup> From then on, many countries have convened and recognized the need to consider the social aspect of the

shift towards a low-carbon, climate-resilient economy, formalizing these in official documents, such as the Silesia Declaration of 2018; the Glasgow Climate Pact, signed at COP26, and the Just Transition Declaration, also signed at COP26. In addition, multi-lateral development banks (MDBs) have collaboratively developed the MDB Just Transition High-Level Principles, which “provide high-level direction on the aims, approach, scope, scale, outcomes and processes associated with a just transition.”<sup>10</sup>

### What can just transition do for carbon pricing?

A just transition ensures that all relevant stakeholders equitably benefit from the shift to a low-carbon, climate-resilient economy and minimizes the negative impacts of climate actions. As a result, a just transition can also lead to increased public satisfaction and buy-in, coupled with increased visibility and transparency, prompting further climate action.

Incorporating just transition provides greater transparency on governments’ actions to manage any negative impacts of carbon pricing, garnering public support and preventing social discontent. Failure to incorporate just transition has likely contributed to the public responses to the energy price hikes in various countries:

- ♦ The yellow vest protests in France that started in 2018 were partially triggered by rising crude oil and fuel prices. The protests, which lasted almost four years, involved hundreds of thousands taking to the streets, leading to violent clashes and riot police firing rubber bullets and tear gas at protesters.
- ♦ Ecuador’s removal of its consumer subsidies on fossil fuels in 2019 led to huge riots that forced the government to flee the capital and reinstate the subsidies 12 days later.
- ♦ In 2022, in Kazakhstan, the removal of price caps on LPG led to violent protests in Almaty, which then led to the government restoring vehicle fuel price caps for six months.

A properly executed just transition in carbon pricing could garner public support for the transition to cleaner, low-carbon, climate-resilient industries.

### What does just transition entail?

Exactly how just transition ought to be implemented has been conceptualized by many entities. One way to unpack the concept is through two types of justice: procedural and distributive justice.

- ♦ **Procedural justice** emphasizes that the dispute resolution process should be fair and that decisions are both made and implemented impartially. When

<sup>7</sup> Institute for Fiscal Studies. 2021. [What is the case for carbon taxes in developing countries?](#)

<sup>8</sup> Grantham Research Institute on Climate Change and the Environment. 2020. [Distributive impacts of a carbon tax in the UK](#).

<sup>9</sup> UNFCCC. 2015. [Paris Agreement](#).

<sup>10</sup> MDB Group. 2021. [MDB Just Transition High-Level Principles](#).

people believe the process to be fair and impartial, and that the rules apply equally to everyone, they are more likely to accept the outcome of the ruling.

- ♦ **Distributive justice** is concerned with the fairness of the distribution of resources. However, the idea of fairness is often different depending on the parties involved, especially when the resource is valued highly.

By upholding these in the execution of climate actions, decision-makers can contribute to ensuring fairness in the process, outcome, and consequences of climate action.

## Just Implementation of Carbon Pricing Instruments

### ***What can policies and institutions do?***

Because of the widespread socio-economic transformation that a shift to a low-carbon, climate-resilient economy requires, a just transition will entail a strategic, systemic approach that will enable the just transition of individual sectors as climate actions, such as the implementation of CPIs, are carried out. This will involve the participation of many different sectors, government ministries, and key stakeholders.

At the national level, the concept of just transition should be integrated into the country's regulatory and institutional framework. Policies should recognize the importance of a just transition, while institutions should be created to handle its implementation. For example, a just transition working group could be created to engage players in relevant ministries. Dialogue between ministries can help ensure that actions taken can be synergistic towards a greater just transition implementation. When it comes to CPI implementation, ministries dealing with regulated industries can voice out their concerns and, with other ministries, develop policy responses. Such collaboration should also involve key stakeholders from civil society.

In addition, because carbon pricing instruments ultimately encourage regulated industries to abandon carbon-intensive operations and opt for cleaner technology, the government should provide an enabling environment for this uptake to further facilitate the process. Financial incentives should be offered so that companies interested in utilizing cleaner technology can more easily penetrate the market. On the consumer side, since cleaner technology is expected to cost more in the beginning, the government should consider providing financial support through positive indirect carbon pricing signals, such as subsidies towards cleaner energy. This is especially relevant in the electricity sector, where the replacement of heavily subsidized fossil fuel-powered electricity with renewable energy can introduce high electricity prices to consumers. Governments

should consider reforms of subsidy schemes to ensure affordable energy prices for their population.

Other national policy-related actions include an assessment of the country's social protection programs, the development and inclusion of appropriate result indicators, and the assessment of capacity and resource requirements to undertake relevant actions.

However, the mobilization of the government towards a just CPI implementation can look different between developed and developing countries. Some government services that are needed to support a just CPI implementation, which in developed countries could be easily modified to meet CPI implementation needs, may be far too inefficient in developing countries to be used. There may even be cases where the necessary services are absent altogether. For example, if a CPI is designed to disburse revenues to low-income households, there needs to be robust mechanisms for this distribution of funds. The absence of such mechanisms in some developing countries presents additional hurdles in a country's attempt to make CPIs more just.<sup>11</sup> Relevant policies and effective implementation will be needed to make this happen.

Another concern in some developing countries is the availability of fuel sources such as locally-sourced firewood, which would not be taxed, and which consumers may opt for if CPIs lead to increased electricity prices. Emissions from the burning of firewood would thus compromise the emission reduction envisioned in the CPI and result in other environmental costs. Government support to alleviate the financial stress that CPIs may cause may be even more crucial in these countries in order to discourage such practices and promote the use of clean energy.

### ***How can just transition be integrated into the design of a CPI?***

The design of a carbon pricing instrument should consider both the procedural and distributive justice aspects of a just transition.

When it comes to procedural justice, key stakeholders should be engaged and consulted throughout the design of the CPI. While stakeholders from the government and the private sector are expected, the engagement of the public, which includes consumers, will also be key.

For example, in the period that the Partnership for Market Readiness (PMR) was supporting Indonesia in preparing and designing potential CPIs in the country, various stakeholder engagement consultations were held to engage the public. Seminars and public discussion workshops at the national level involved the general public, which included civil society, non-governmental organizations, and academia.

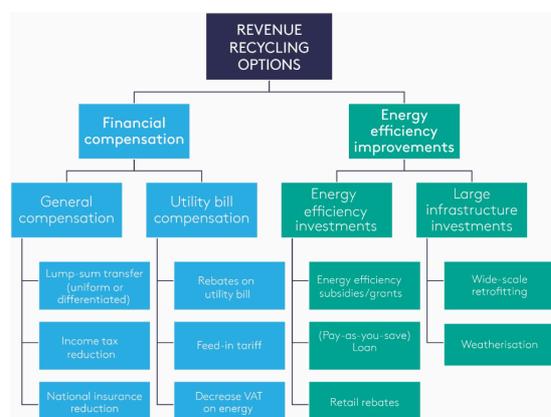
<sup>11</sup> IFS. 2021. [What is the case for carbon taxes in developing countries?](#)

Surveys were also conducted in Indonesia annually to understand the public perception of carbon markets. These surveys revealed that although most stakeholders, including the public, had sufficient awareness of the market's issues, there was still a need for additional capacity building and dissemination of information. Dissemination of CPI information during PMR support was conducted through various media, including briefing papers/policy papers, technical notes, the PMR website, newsletters, brochures, and multimedia presentation materials, among others.<sup>12</sup>

When it comes to distributional justice, how revenues gained from CPIs have a large potential to address negative impacts on consumers, considering both vertical and horizontal impacts associated with CPIs. Revenue recycling sees that governments utilize revenues from CPIs towards programs and schemes beneficial to vulnerable communities.

Revenue recycling mechanisms aim to offset the heterogeneous impact of carbon prices while increasing the CPI's social acceptability as a just climate policy. Previous studies have developed quantitative models to assess the impact of alternatives that reallocate government revenues, coming either from carbon tax collections or from allowances in an ETS scheme.<sup>13</sup> Several revenue recycling options have been devised, as shown in Figure 2.

Figure 2: Revenue recycling options within two categories: direct financial compensation and energy efficiency improvements



Source: Grantham Research Institute on Climate Change and the Environment. 2020. [Distributional impacts of a carbon tax in the UK](#).

The options most assessed in the literature and most widely implemented are direct compensations to households, or **lump-sum transfers**,<sup>14</sup> which are more transparent and easier to design in terms of accountability and practical implementation.

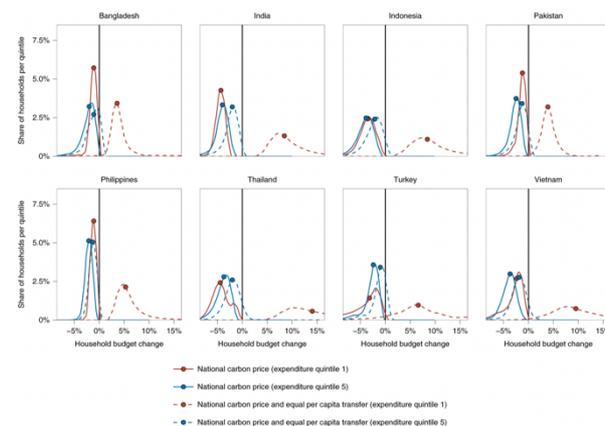
<sup>12</sup> Partnership for Market Readiness Indonesia. 2019. [PMR Indonesia Project Implementation Status Report \(ISR\)](#).

<sup>13</sup> Grantham Research Institute on Climate Change and the Environment. 2020. [Distributional impacts of a carbon tax in the UK](#).

<sup>14</sup> US Federal Reserve. 2021-023. [Recycling Carbon Tax Revenue to Maximize Welfare](#).

As an example, in countries where a carbon tax on electricity has been observed to be regressive, revenues coming from tax payments could be directed as cash payments to lower-income households - those most likely to be significantly and negatively impacted by the tax.<sup>15</sup> When modeled for various developing countries in Asia, revenue recycling proved to be beneficial for the lowest household expenditure quintile when compared to no revenue recycling, increasing their household budgets (Figure 2).

Figure 3: Distribution of the incidence of a national carbon price with equal per capita transfer for first- and fifth-income quintiles.



Source: Nature Sustainability. 2021. [Distributional impacts of carbon pricing in developing Asia](#).

**In the US context, Labor tax cuts** were found to be more progressive in distributing the outcome and with lower welfare costs. By increasing the progressivity of the policy, through a reduction in the average labor tax for low-labor income earners, results improve the lump-sum results.<sup>16</sup> Simulation studies in France found that imposing a €110/tCO<sub>2</sub> tax and recycling the associated revenues to cut labor taxes led to a 0.6% increase in GDP and a 1.2% increase in employment compared to the situation without a carbon tax.<sup>17</sup>

Other revenue recycling alternatives were studied in the context of lifetime models, implemented by the Tax Foundation in the US context, and found that **corporate income tax cuts** are more effective in offsetting the regressivity of carbon taxes than individual lump-sums. As represented in Figure 4, the marginal rate cuts, addressing low-income payers, were found to significantly lower the costs of a carbon tax.<sup>18</sup>

<sup>15</sup> Nature Sustainability. 2021. [Distributional impacts of carbon pricing in developing Asia](#).

<sup>16</sup> Idem

<sup>17</sup> French Association of Environmental and Resources Economists. 2021-22. [The equity and efficiency trade-off of carbon tax revenue recycling: a Re-examination](#).

<sup>18</sup> Resources for the future. [Tax Reform and Environmental Policy](#).

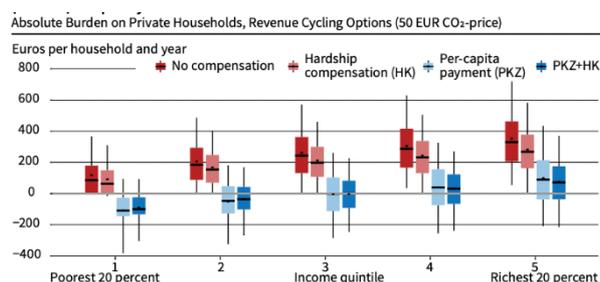
Figure 4: Average annual Household carbon tax bills in 2030 as a percentage of income under different revenue recycling policies



Source: Grantham Research Institute on Climate Change and the Environment. 2020. [Distributional impacts of a carbon tax in the UK](#).

Studies using German household data explore the combination of other revenue recycling policies, adding to the per-capita payments electricity price reduction, long-distance commuting compensation for households commuting more than 20 km, oil heating compensation paying households owning an oil heating system a fixed sum per year, and hardship-based compensation which combines the last two. As shown in Figure 5, findings show that all policies lead to a more progressive result both in terms of vertical and horizontal impacts (observed by changes in the height of the color-code boxes).<sup>19</sup>

Figure 5. Relief potential along the horizontal and vertical inequality dimension



Source: Leibniz Information Centre for Economics. 2021. [Carbon pricing and revenue recycling: An overview of vertical and horizontal equity effects for Germany](#)

Case studies also provide positive conclusions about revenue recycling. Table 1 summarizes several policies from three case studies.

Table 1: Case Study of using Carbon Revenues

	British Columbia	California	Japan
Revenue raising mechanism	Carbon tax revenue	ETS	Carbon tax
Use of revenue	100% to reduce existing taxes, with some revenues allocated to green initiatives starting in 2018	100% allocated to the Greenhouse Gas Reduction Fund (GGRF) and 60% of revenues earmarked for transportation, affordable housing, and sustainable communities.	100% earmarked to climate change-related projects

<sup>19</sup> Leibniz Information Centre for Economics. 2021. [Carbon pricing and revenue recycling: An overview of vertical and horizontal equity effects for Germany](#)

		35% of all funds are for projects that benefit disadvantaged and low-income communities.	
Annual revenues (year/period)	USD 932 million (FY 2017/18)	The cap-and-trade auctions of state-owned allowances generated around US\$ 9.5 billion from 2013 through 2018	USD 2.5 bn (2016)
Implementation	Returned to business and families through reduction and other taxes and lump-sum payments	Allowances are freely allocated to both electrical distribution utilities and natural gas suppliers to limit the impact of the cap-and-trade program on electricity and natural gas bills.	Revenues from the carbon tax are lumped together with the revenues from the petroleum and coal tax.
Results	60% of carbon tax revenues have benefited businesses via corporate tax rate cuts and increased tax credits 40% have been returned to households, making the tax highly progressive Public support of the tax grew steadily over time, 40% to 65% approval from 2008 to 2012	Consultations, performance analysis, and comprehensive communication to assess and promote effective use of carbon revenues take place ex-ante and ex-post the implementation. From 2013 to 2017 over USD 4 bn of GGRF money was directed toward clean transportation, affordable housing and sustainable communities.	Japan's carbon tax was explicitly passed to fund renewable energy and energy efficiency programs: green subsidies and R&D support for (e.g.) lithium-ion batteries, distributed energy generation, and carbon capture and storage.

Source: World Bank, 2019. [Using Carbon Revenues: Annex to report: Case studies](#).

In general, studies found **positive evidence toward compensating the regressive effect of the carbon tax**, in both developing and developed countries, while caveats on the implementation need to be considered in the country context. Overall, the optimal implementation of a revenue recycling mechanism towards a fairer social landscape hinges on the capacity of the policymaker to rebate the revenue to counterbalance the regressive impact potentially caused by CPI implementation.

## Conclusion

- ♦ Mechanisms like the CPIs will help countries align their low-carbon, climate-resilient strategies towards a cost-effective alternative to abate emissions.
- ♦ Besides the climate-related benefits of determining a carbon price or a quantity cap on the level of CO2 emissions, there are social impacts that need to be addressed by policymakers.
- ♦ To address social fairness in a CPI implementation, it is necessary to assess heterogeneous distributional effects among geographies, rural-urban locations, and income groups. A transition could not be just if is not counterbalancing existing inequalities and avoiding

subsequent gaps to be generated among population groups.

- ♦ Revenue recycling mechanisms embed redistributive purposes, while increasing social acceptance of the CPIs policy implementation.
- ♦ Among the different alternatives of rebating government revenues, policymakers need to address the impact on the country-specific context, since income groups' characteristics and individual preferences will vary across countries.
- ♦ The CPI analysis/design/implementation should be made with an enduring perspective, aligned to the country long-term strategy.

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