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Fiscal Policy for Resilience and Decarbonization: Contributions to the Policy Dialogue

Editors:

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CONTRIBUTIONS TO THE POLICY DIALOGUE

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Huáscar Eguino and Raúl Delgado
(editors)

IDB

Abstract

This publication includes contributions for the design of fiscal policies that are oriented towards decarbonization and resilience to climate change. It addresses the main areas of responsibility of finance ministries by providing a review of the challenges faced by countries in Latin America and the Caribbean (LAC) in each area of responsibility, a summary of advances in knowledge with an emphasis on identifying best practices, and a series of technical guidelines that can be useful for facilitating the integration of climate actions into fiscal policy and management. Given the topicality of these matters and the growing interest shown by ministries of finance to establish their own roadmaps for climate action, it is an opportune moment to present this work, which aims to contribute to the technical dialogue and generate inputs for the design of action plans and roadmaps so that fiscal policies can contribute to decarbonization and economic resilience.

JEL Codes: H30, H50, H53, H60, O10, O20, O38, O54, Q01, Q20, Q50, Q56, Q588.

Keywords: public economy, fiscal policy, public finances, public spending, national budget, green procurement, climate change, mitigation, adaptation, natural disasters, economic development, sustainable development, resilient infrastructure.

Contents

Acronyms

CCRIF	Caribbean Catastrophe Risk Insurance Facility
COSEFIN	Council of Finance Ministers of Central America, Panama, and the Dominican Republic (Consejo de Ministros de Hacienda o Finanzas de Centroamérica, Panamá y República Dominicana)
ESG	Environmental, social, and corporate governance factors
GDP	Gross domestic product
GHG	Greenhouse gas
IDB	Inter-American Development Bank
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LAC	Latin America and the Caribbean
LTS	Long-term strategy
MAPS	Methodology for Assessing Procurement Systems
MDB	Multilateral development bank
NDCs	Nationally determined contributions
OECD	Organisation for Economic Co-operation and Development
PEFA	Public Expenditure and Financial Accountability
PFM	Public financial management
SDGs	Sustainable Development Goals
SMEs	Small and medium enterprises
SPP	Sustainable public procurement
TCFD	Task Force on Climate-Related Financial Disclosures

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Introduction: Raúl Delgado and Huáscar Eguino

Chapter 1: Raúl Delgado and Adrien Vogt-Schilb

Chapter 2: Luis Alejos

Chapter 3: Carlos Pimenta

Chapter 4: Leslie Harper and Guy Edwards

Chapter 5: Huáscar Eguino

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Introduction: Ministries of Finance and Climate Change

Raúl Delgado and Huáscar Eguino

All the countries of Latin America and the Caribbean (LAC) have signed up to the objectives of the Paris Agreement, which are aimed at boosting each country's resilience and adaptive capacity as well as stabilizing global warming below 2°C and as near as possible to 1.5°C. Achieving these transformations and the necessary reductions in emissions demands unprecedented, wide-ranging changes at the global level in the sectors of energy, construction, industry, transport, and agriculture, among others. Moreover, the physical impact of climate change and such transformations imply additional challenges for fiscal sustainability and generate new responsibilities for finance ministries.

Fiscal policy is a powerful tool for helping to ensure compliance with national commitments under the terms of the Paris Agreement and to facilitate a rapid and orderly transition to resilient, low-carbon economies. Expenditure, taxation, pricing and public investment, borrowing, and financial policies can all contribute, in combination, to a transformative effect on the behavior of different economic actors. Likewise, they are capable of offering greater resilience to investment in infrastructure and addressing the distributive impacts of the transition to resilient, low-carbon economies while safeguarding the sustainability of public finances and avoiding the emergence of stranded assets. Although the ministries of finance of LAC are already recording some progress when it comes to incorporating the climate dimension into their decision making (Delgado, Eguino, and Lopes, 2021) much still remains to be done. This paper seeks to help achieve an understanding of the inevitable interdependence between the results of fiscal policy and management and the climate agenda, while also proposing a series of intervention options that are potentially useful for decision makers in the region's finance ministries.

The six chapters of this paper tackle the areas of responsibility within finance ministries that are particularly relevant for climate action: (i) fiscal impacts of the transition to decarbonized economies, (ii) fiscal risks associated with climate events, (iii) policies and management of climate change–related expenditure, (iv) green procurement policies and management, (v) climate change and public investment management, and (vi) carbon pricing, subsidies policy, and the tax agenda. Each chapter is organized similarly, presenting the problem or challenge, the current state of knowledge of the subject, and a set of best practices, as well as a series of guidelines for policy design. It is hoped that this paper can provide finance ministry authorities and technical staff with a set of possible actions that could prove useful for integrating climate action into the fiscal policy of their respective countries. Likewise, it is hoped that the publication serves as a

reference for the growing number of professionals with an interest in adopting a proactive fiscal policy to tackle the climate crisis.

The main contents of each chapter can be summarized as follows:

- **Fiscal impact of the energy transition.** The transition towards low-carbon economies implies risks for fiscal sustainability but also presents opportunities in new areas of growth and development. The global energy transition, driven by technological change and international commitments to comply with the Paris Agreement, leads to uncertainty about the future demand for fossil fuels, prices, and associated public revenues. A well-planned transition can lead to a pathway of more robust growth and of truly sustainable development, thereby contributing to fiscal sustainability. Ministries of finance now face the challenge of building institutional capacities to enable early identification and fiscal management of the transitional risks. Among the priority actions that these organisms should consider are: (i) developing long-term strategies alongside environment ministries and sector portfolios that incorporate fiscal policy instruments into their design and implementation; (ii) identifying, quantifying, and managing the impacts of the transition at the macro-fiscal level and in public finances, including the risk of stranded assets; (iii) reviewing fossil fuel subsidy policies in areas in which reforms are necessary that aim at the rationalization and/or progressive elimination of such subsidies; and (iv) supporting the identification of sectors and communities that will face difficulties due to the energy transition and changes in subsidy policies.

- **Disaster risk management.** The increase in both the frequency and intensity of disasters caused by climate change represents a significant challenge for the region. LAC is one of the most vulnerable regions when it comes to the negative effects of climate change. The magnitude, frequency, and duration of climate change–related natural disasters have multiple impacts on public finances. For example, at the world level, it is estimated that the occurrence of just one event per year is associated with an increase in the fiscal deficit for that year of 0.8 percent of GDP for lower-medium-income countries and of 0.9 percent of GDP for low-income countries. Faced with this challenge, the ministries of finance will benefit from (i) developing and implementing methodologies to identify and quantify the main fiscal risks derived from climate events, (ii) incorporating fiscal risks into short- and medium-term fiscal planning, and (iii) developing financial strategies for disaster management and methodological frameworks for their evaluation.

- **Public spending.** Satisfactory management of public finances requires rules, mechanisms, processes, and controls that can support expenditure decisions that avoid additional fiscal costs and contribute towards an orderly, fair, and inclusive transition towards a carbon-neutral economy.

  However, green public financial management (PFM) practices are still incipient in the majority of the region's countries. The lack of data regarding climate-related public spending significantly limits countries' capacity for evaluation and hampers accurate identification of the fiscal risks derived from the impacts of climate change.

  To advance with green PFM and improve expenditure effectiveness and efficiency, ministries of finance can intervene through different actions: (i) carrying out a diagnostic and drafting a

strategic plan with the aim of integrating climate change objectives in their PFM; (ii) consistently and periodically identifying public climate spending and monitoring its execution; (iii) gathering information to provide feedback for the budget formulation process with evaluations of all climate-related expenditure; (iv) producing green financial statements that standardize information to make it comparable with other countries, thereby facilitating audits; and (v) implementing transparency, monitoring, and oversight mechanisms for climate-related public spending and countries' international commitments.

» **Green procurement.** Public procurement represents nearly 20 percent of total expenditure of governments in the region, which means that the impact of green procurement policies and management is potentially high, within the framework of compliance with commitments under the Paris Agreement. Nonetheless, challenges persist when it comes to adopting policies and rules for green procurement such as the lack of institutional capacities, knowledge gaps, or the lack of environmental criteria and conflict with other priorities. Fortunately, some progress has been made in the region and countries are in a position to make diagnostics, develop tools, and build the institutional capacities needed to promote green procurement.

With the application of methodologies and tools already available, such as the Public Expenditure and Financial Accountability (PEFA) climate module and the Methodology for Assessing Procurement Systems (MAPS) sustainability module, finance ministries will be in a better position to develop action plans that include, among other objectives: (i) formulating a green procurement strategy; (ii) strengthening the legal and policy framework to incorporate the climate dimension into procurement procedures; (iii) carrying out market studies to identify the potential supply of sustainable or green products; (iv) introducing environmental rules into technical specifications, procurement selection, and adjudication criteria, as well as in clauses for the execution of contracts and benchmark products; and (v) designing training plans.

» **Public investment to combat climate change.** In order to tackle the climate crisis, the expenditure required to provide infrastructure services represents between 2 percent and 8 percent of GDP, while expenditure to address diverse social challenges will require between 5 percent and 11 percent of GDP. These estimates indicate that between 7 percent and 19 percent of annual GDP must be aligned with the Sustainable Development Goals (SDGs). Most of this effort will consist in redirecting the existing flows of resources and establishing new investment priorities that favor resilient, low-carbon infrastructures and that make use of natural capital. Some of the actions that ministries of finance may consider are: (i) making robust diagnostics to integrate climate change into public investment management (by applying, for example, the C-PIMA tool), (ii) ensuring the link-up between public investment programming with national decarbonization and resilience strategies, (iii) integrating climate action into management throughout the life cycle of public investment projects, and (iv) developing strategies that facilitate access to green financing.

» **Pricing and fiscal incentives.** The pricing system can either hamper or help a country's greenhouse gas emission reduction strategies. One example is seen in fossil fuel subsidies that represent 1.1 percent of GDP in the region. Nonetheless, beyond energy subsidies, and despite the strong arguments in favor of other carbon pricing schemes and more than 50 price-fixing schemes either implemented or planned throughout the world, their use continues to be slow and face diverse difficulties, such as the distributive impact. Of equal importance,

this paper highlights the fact that the empirical evidence shows that, although carbon price mechanisms used in the world have permitted marginal reductions in emissions, they have not had an impact on investment in the transition towards net-zero emissions. This is because there are other institutional and market failures that are as important, or even more important, than the absence of a carbon price. Some of these are the lack of adequate infrastructure and market regulations that favor polluting technologies, which only highlights the need for governments to intervene with a wide range of public policy actions to facilitate the transition towards a net-zero emission economy. In any case, countries that wish to advance towards establishing carbon pricing mechanisms should include the following aspects in their design: (i) the impact on competitiveness; (ii) the use of revenues to support the achievement of climate objectives; (iii) the assessment of the distributive impacts and efficiency of the tax; (iv) the establishment of options for using the resources generated, such as compensation for the distributive impacts of the tax; and (v) the establishment of an appropriate communication strategy oriented to facilitating implementation of the chosen reforms.

Chapter 1

Fiscal Impacts of the Transition to Decarbonized Economies

Raúl Delgado and Adrien Vogt-Schilb

1.1. Introduction and Key Questions

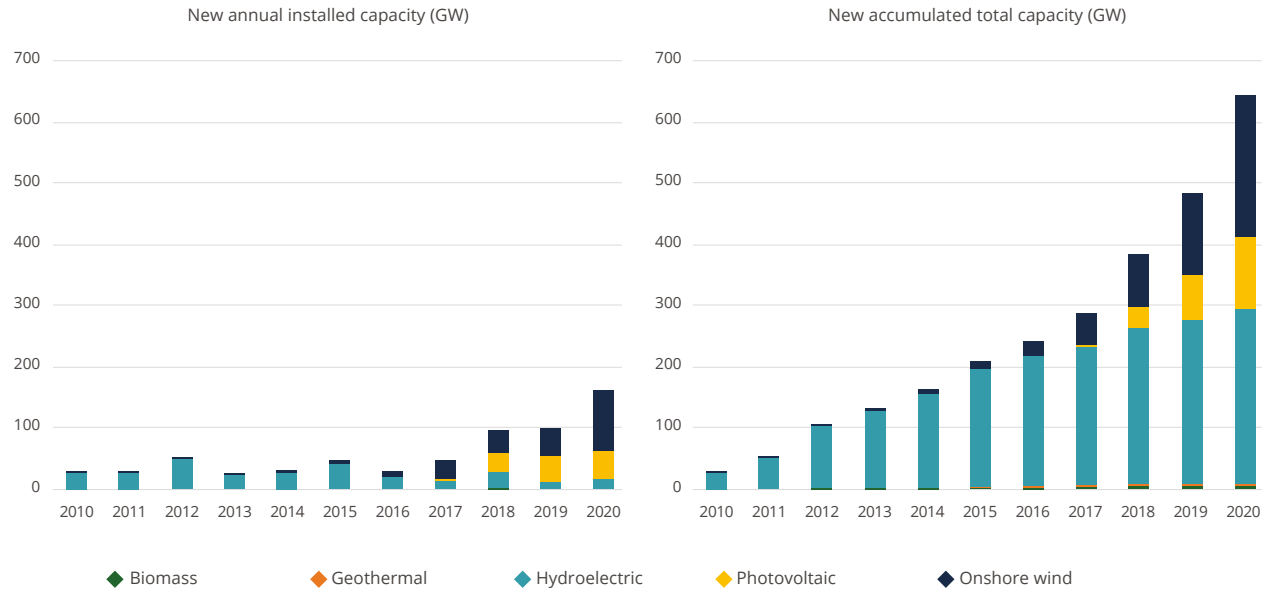
The transition towards low-carbon economies implies risks for fiscal sustainability, although it also presents opportunities in new areas of growth and development. The global energy transition driven by technological change and international commitments to comply with the Paris Agreement causes uncertainty regarding the volume of future demand for fossil fuels, prices, and associated public revenues. In this context, the finances of the region's countries can be expected to suffer from the risk of holding resources and physical assets that can no longer be exploited and that may devalue over time, or activities which will have to be terminated before the end of their useful life (Delgado, Eguino, and Lopes, 2021).

At the global level, commitments made by countries under the Paris Agreement include significant reductions in emissions, which will have implications for the future demand for fossil fuels. Under their nationally determined contributions (NDCs), 74 countries have made the decision to implement long-term decarbonization strategies or made official declarations within the framework of a commitment to reach net-zero emissions by around 2050 (WRI, 2021). In a 2050 scenario consistent with the goal of limiting the increase in global temperatures to less than 1.5°C, it is estimated that the demand for coal will fall by 98 percent to represent less than 1 percent of energy use, the demand for natural gas will decrease by 55 percent, and demand for oil by 75 percent (IEA, 2021a). In the case of the oil and gas sectors, upstream investments are now half of what they were in 2014 and, in the net-zero emissions scenarios of 2050, it is estimated that, except in the case of the brownfield projects currently under development, additional investments of this type will no longer be required (IEA, 2021b).

Renewable energies now consistently represent more than half of the investments in new generation capacity, surpassing fossil fuels and nuclear energy as a whole. The energy transition is a process already underway. Generating power from renewable sources continues to break records in terms of lower costs and increases in new installed capacity, even bearing in mind the reductions in subsidies and the fall in economic activity caused by the pandemic (IRENA, 2020, 2021b). Over the last decade, around 644 GW of energy generation capacity was produced with

renewable energy at the world level, at a lower cost than the cheapest fossil fuel alternative. As the costs of non-conventional energy sources—particularly onshore wind energy and photovoltaic solar energy—decline, their share in new investments continues to rise. From 2017 to 2020, wind and solar energy represented 81 percent of new installed capacity from renewable sources.

Figure 1.1. Advances in Installed and Accumulated Capacity from Renewable Energies, 2010–20

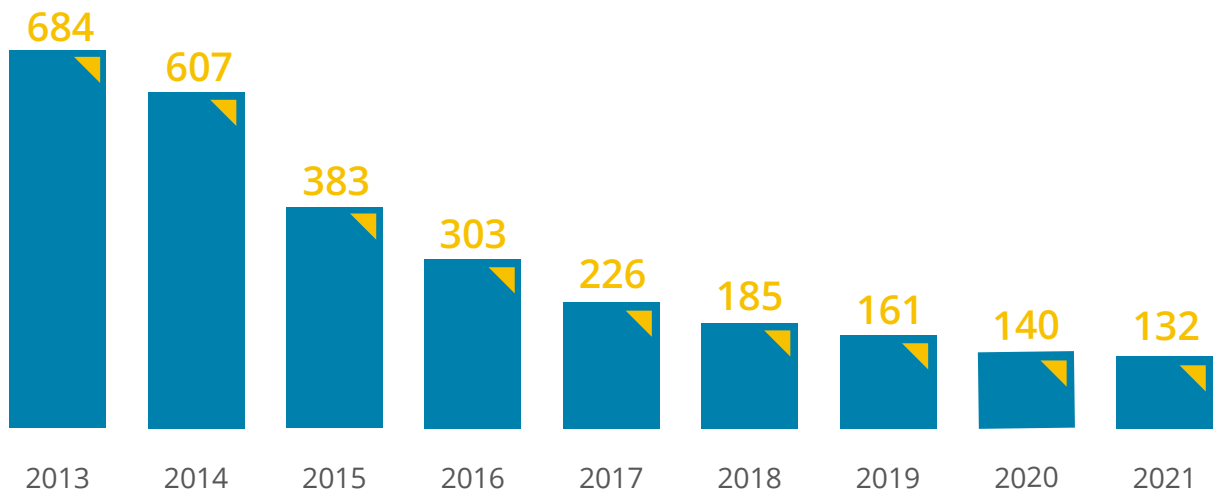


Source: IRENA (2021a).

In recent years, there has been a noticeable increase in the uptake of electric transport. Around 20 million electric passenger vehicles currently operate in the world, alongside more than 1.3 million commercial electric vehicles—including buses, delivery vans, and trucks—with more than 280 million mopeds, scooters, electric bikes, and electric three-wheelers on the roads (BloombergNEF, 2022). In 2021, sales of electric vehicles were more than double the previous year. The internal combustion passenger vehicle segment is considered to have reached its historical peak in 2017 and, by 2030, more electric passenger vehicles—whether hybrids, fuel cell, or electric—will be sold than internal combustion passenger vehicles (BloombergNEF, 2021, 2022). The major automobile manufacturers, including the three largest, are investing in electromobility and have announced their intention to abandon the sale of internal combustion automobiles by 2040 at the latest, while the majority plan to do so even before then. By 2020, Santiago de Chile was already operating the largest fleet of electric public transport buses outside of China.

The cost of lithium batteries plays a special role in the adoption of renewable energies, as well as in the process of electrifying the transport sector. Between 2010 and 2020, their cost fell by 89 percent (13 percent in 2020 alone), and it is estimated that by 2024 their cost will reach the so-called "tipping point" at which time manufacturers can produce electric automobiles (passenger, buses, and commercial vehicles) with a price and margin similar to that of vehicles with internal combustion engines (BloombergNEF, 2021). Electric vehicles are already substantially cheaper to operate, given that they consume much less energy and require less maintenance.

Figure 1.2. Price of Batteries, 2013–21 (constant dollars, 2021/kWh)



Source: BloombergNEF (2021).

There is a growing recognition that climate change and a disorderly transition to low-carbon and resilient economies can have a systemic impact on the financial sector (CFTC, 2020; OECD, 2021a; TCFD, 2017). An orderly transition requires financial systems to adapt to regulatory changes, technological change, and consumer preferences. Faced with this challenge, the financial sector must adequately evaluate the risks, publish relevant information, and allocate a price to the financial risks associated with climate change (TCFD, 2022). In 2015, the Financial Stability Board (FSB) established the Task Force on Climate-Related Financial Disclosures (TCFD) with the aim of making recommendations to promote the availability of better information on the impact and exposure of assets and the financial system to the physical and transitional impacts of climate change. In 2017, the TCFD delivered its first set of recommendations and, towards the end of 2021, more than 2,600 firms, corporations, and financial institutions from around the world, representing assets of more than USD 194 billion, had adopted them. At the global level, both regulators and participants in the financial sector still find themselves in an initial stage of analysis and understanding of climate risks; nonetheless, recent studies show that the financial markets are beginning to anticipate the transition away from investments in fossil fuels to renewables (CFTC, 2020; OECD, 2021a). For example, the share of the fossil fuel energy sector in the US S&P 500 index has fallen from 13 percent a decade ago to just 3 percent in 2020 (IRENA, 2021a, 2021b); for their part, the main ratings agencies (AM Best, Moody's, S&P, and Fitch) explicitly include the financial impacts of climate change in their rating processes, which means evaluating the firms' level of exposure to extreme hydrometeorological events or risks deriving from the evolution of energy costs due to the transition (TCFD, 2022).

Although some progress has been recorded in Latin America and the Caribbean (LAC), countries must make greater efforts to internalize climate change within their economic development and decarbonization strategies (Delgado, Eguino, and Lopes, 2021). The region continues to make fossil fuel–related investments in sectors such as energy, transport, and extractive industries in a way inconsistent with the Paris Agreement and without an adequate evaluation of the risks to the

regulatory framework posed by technological changes, or of risks for investors and consumers.[1] For example, it is estimated that the committed emissions from the LAC electricity sector will rise to 6.9 $GtCO_2$ (gigatonnes of carbon dioxide), an amount that exceeds the carbon budget for the entire region in a world limited to global warming between 1.5°C and 2°C. To achieve coherence, between 10 percent and 16 percent of the existing fossil fuel capacity will have to be prematurely closed down, or the rate of use of the power stations reduced. Despite this, it is estimated that, in the event that all the fossil fuel–based power plants planned or announced for the region are finally built, the level of committed emissions from the energy sector of LAC will reach a level well above 13.6 $GtCO_2$, a situation that would entail even greater risks related with the loss of incomes, jobs, taxes, and assets caused by the premature closure of these power stations when it comes to complying with climate goals (González-Mahecha et al., 2019).

Stranded or abandoned assets caused by the energy transition can have serious negative consequences for the region. Among these assets are fossil fuel–based electricity power stations; the oil, gas, and coal fields that will remain untapped due to the energy transition; the infrastructure related to electricity transmission and/or exploitation; and the transport and processing of oil, gas, and coal (Binsted et al., 2019). The impact of stranded assets affects firms in the extractive sector, electricity generation and transport, supply and value chains, and the workers and communities associated with those sectors (Saget, Vogt-Schilb, and Luu, 2020). Nonetheless, one of the main risks of stranded assets is the drastic fall of public revenues arising from activities in the extractive sector, such as royalties, and from taxes on gasoline, as well as from the additional fiscal pressures caused by contingent liabilities in the related sectors (Coffin, Dalman, and Grant, 2021). For example, if the Paris Agreement goals are to be achieved, then between 66 percent and 81 percent of LAC oil reserves will not be exploited until 2035 and the consequent tax revenues will fall between USD 1.3 billion and USD 2.6 billion (Solano-Rodríguez et al., 2019). Under the same assumption, in the case of natural gas, 70 percent of the proven, probable, and possible reserves of the region will remain unexploited, which would mean that the fiscal revenues accumulated in the period 2017–35 arising from natural gas would correspond to less than a quarter of what would otherwise be expected (Welsby et al., 2021).

Fiscal management must also tackle the costs and distortions caused by subsidies for the production and consumption of fossil fuels in the region. In 2020, LAC countries provided USD 60 billion in fossil fuel subsidies, approximately 1.3 percent of their GDP (Parry, Black, and Vernon, 2021). The externalities associated with these subsidies due to air pollution, global warming, traffic congestion, accidents, damages to road infrastructure, and uncollected consumption taxes represent around USD 145 billion (Parry, Black, and Vernon, 2021). Nonetheless, between 2013 and 2016, there was a fall in subsidies to fossil fuels in 76 countries, among them Argentina and Mexico. In 2017, the level of subsidies was 40 percent lower than observed in 2013 (OECD and IEA, 2019). The experiences of Chile, Ecuador, and Mexico, however, indicate that success in reforming the system of subsidies can only be achieved by taking into account the political, economic, social, and climate consequences (Feng et al., 2018; Schaffitzel et al., 2019).

1 For example, in the case of Colombia, 37 percent of direct foreign investment (DFI) is channeled into sectors such as oil and mining.

1.2. Advances in Knowledge and Best Practices

Countries are making increasingly ambitious commitments and taking measures to reduce CO_2 emissions and initiate the process of transition towards clean energies. A total of 137 countries have either committed, or announced their aim, to reach carbon neutrality by around 2050 or before.[2] Among them are 21 countries from the LAC[3] region, as well as the United States, Japan, and the European Union. The United Kingdom, the first country that announced in 2015 that it would stop burning coal for power generation, also has an implementation plan that includes financial support to the industry during the transition period financed by a special charge for electricity supply. A total of 48 countries[4] and a further 48 subnational governments have joined the Powering Past Coal Alliance initiative, whose objective is to progressively reduce the burning of coal for generating electricity. Germany, one of the members of this partnership, has announced plans to eliminate the use of coal by 2038, which includes the allocation of USD 45 billion for a compensation fund that will help towards the closure of lignite mines and energy plants that burn coal, finance new infrastructure projects in the areas affected, and provide training for workers in the sector to help them find new job opportunities.

The governments of Latin America cannot control the evolution of technology nor the level of ambition of global climate policies, but they are exposed to their consequences. Despite the evidence, countries and firms have only recently begun to take the importance of timely management seriously to avoid the additional costs that stranded assets would imply for economies and public finances. Delays in implementing decarbonization actions can increase the cost of these assets in the future, given that investment will continue to be made in power stations operating with fossil fuels, and infrastructure for the exploitation of oil and gas, refineries, etc. In the region, Chile has designed a plan for the early closure (before the end of their useful life) of coal-burning power stations, in line with the long-term goal of decarbonization of the country and its interest in exploiting electricity generation from renewable sources. Alongside participation from the African Development Bank (AfDB), analysis has been made of the impact on the economy of the transition to lower carbon emissions, and it was found that the majority of the risk and the potential impact (approximately 75 percent) was derived from factors, policies, and actions that were beyond the control of the government of the country but that would generate additional fiscal pressures for public finances. Nonetheless, the study shows that the government can still mitigate the risk to a large extent if it takes action in time (Huxham, Anwar, and Nelson, 2019). A similar study was carried out for Uganda and another is currently underway in Colombia with the participation of the Ministry of the Treasury and Public Credit (Ministerio de Hacienda y Crédito Público) and the National Planning Department (DNP) (Departamento Nacional de Planeación).

Eliminating fossil fuel subsidies brings benefits in terms of economic and fiscal efficiency; moreover, it can contribute significantly to reducing greenhouse gas (GHG) emissions. In 2009, the G20 announced its commitment to gradually eliminate subsidies for fossil fuels (G20, 2009). Its implementation, however, has been difficult (OECD and IEA, 2019). At the global level, fossil fuel subsidies reached USD 760 billion in 2020 (Parry, Black, and Vernon, 2021). Moreover, 75 percent

2 See https://www.visualcapitalist.com/sp/race-to-net-zero-carbon-neutral-goals-by-country/.

3 Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guyana, Haiti, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, and Uruguay.

4 Among them, there are six LAC countries: Chile, Costa Rica, El Salvador, Mexico, Peru, and Uruguay.

of subsidies were due to the countries' internal policies, which means that rationalizing them represents an opportunity to both reduce emissions and make fiscal savings (IMF, 2019c). It is estimated that reforms aimed at establishing efficient fossil fuel prices would lead to a reduction of up to 28 percent in annual carbon emissions and increase public revenues by approximately 3.8 percent of GDP (IMF, 2019c).

Long-term decarbonization strategies help to identify which regulatory and policy reforms are required, as well as the investment options needed to make the transition orderly, fair, and inclusive. From a fiscal management perspective, reaching net-zero emissions will require transformations in all sectors of the economy, among them the energy and transport sectors, which means that the direct implications of policies and their fiscal results are unavoidable (Delgado, Eguino, and Lopes, 2021). Properly planning the transition and possessing a long-term perspective are essential actions for guiding fiscal management decisions in the short term. Long-term strategies (LTSs) can help governments plan the transition to net-zero carbon emissions by 2050 and help build a consensus about the development goals necessary for decarbonization. Just like planning instruments, LTSs can help to anticipate and manage the possible dilemmas encountered during the transition process (Jaramillo and Saavedra, 2021). To be effective and useful, an LTS should be designed by each individual country, a task that will involve the environmental ministry, the line ministries, the treasury, and the planning ministry (WRI, 2021).

Setting out the pathways to decarbonization must be supported with a long-term strategic design perspective. The Paris Agreement invites countries to formulate lasting low-emission strategies. A solid LTS that is well designed and agreed to by the relevant actors is a powerful tool for helping governments to identify the transformations required in each sector for decarbonization, as well as the economic benefits of using modern and more efficient technologies and the synergies between decarbonization and economic development. An LTS can also help to anticipate and manage the risk of stranded assets and their associated fiscal and financial costs, minimize and compensate for possible social impacts, and define a sequence of policy reforms and public investments necessary to achieve a carbon-neutral future (Jaramillo and Saavedra, 2021).

1.3. Options to Continue Improving Fiscal Management of Climate Change Adaptation and Transition

The region's ministries of finance will benefit greatly from initiating a process to strengthen institutional capacities to enable timely identification and fiscal management of the transition towards low-carbon economies. Among the priority actions, the following are worth mentioning: (i) in coordination with the environment ministry and the line ministries, developing an LTS that incorporates fiscal policy instruments into its design and implementation; (ii) identifying, quantifying, and managing the impacts of transition at the macro-fiscal level and in public finances, including the risk of stranded assets; (iii) reviewing fossil fuel subsidy policies in those areas in which reforms are needed, with a view to rationalization and/or progressive elimination of such subsidies; and (iv) helping to identify the sectors and communities that are bound to face difficulties as a result of the energy transition and changes in subsidy policies.

For timely identification and management, three significant knowledge gaps present in LAC must be addressed: (i) identifying the sectors at risk, (ii) measuring the size of the problem, and (iii) quantifying compensation measures. That which is not measured remains unknown. The first gap to tackle is the almost total nonexistence of country-level studies regarding the possible impact of the transition towards decarbonized economies. Sector-based studies should be made of the fiscal risks of the transition and how to identify the actions needed to manage such risks. This also implies quantifying the fiscal impact of decarbonization strategies and the transition on the energy sector and other exposed sectors, assessing the assets at risk as well as establishing a timeline, and identifying the channels of transmission, which includes an economic, fiscal, and socioenvironmental evaluation of the stranded assets and their implications for political decision making. Such analysis must be complemented with exercises to quantify both the potential cost of compensation measures for vulnerable groups and the elimination of fossil fuel subsidies.

In order to address the aforementioned knowledge gaps, the Inter-American Development Bank (IDB) has published various studies. Worth mentioning among these are the papers dealing with the role of fiscal policy in tackling climate change (Delgado, Eguino, and Lopes, 2021); the risk of the climate transition in the region, including the risk of stranded assets in the energy sector due to the under-ambitious targets of current NDCs (Binsted et al., 2019); the risk of over-investment in natural gas power stations (González-Mahecha et al., 2019); fiscal risk for countries that export oil and natural gas (Solano-Rodríguez et al., 2019; Welsby et al., 2021); and quantification of public and private expenditure, which should be realigned to comply with the Paris Agreement mitigation and adaptation goals for LAC (Galindo Paliza, Hoffmann, and Vogt-Schilb, 2022).

Chapter 2

Fiscal Risks Associated with Climate Events

Luis Alejos

2.1. Introduction and Key Questions

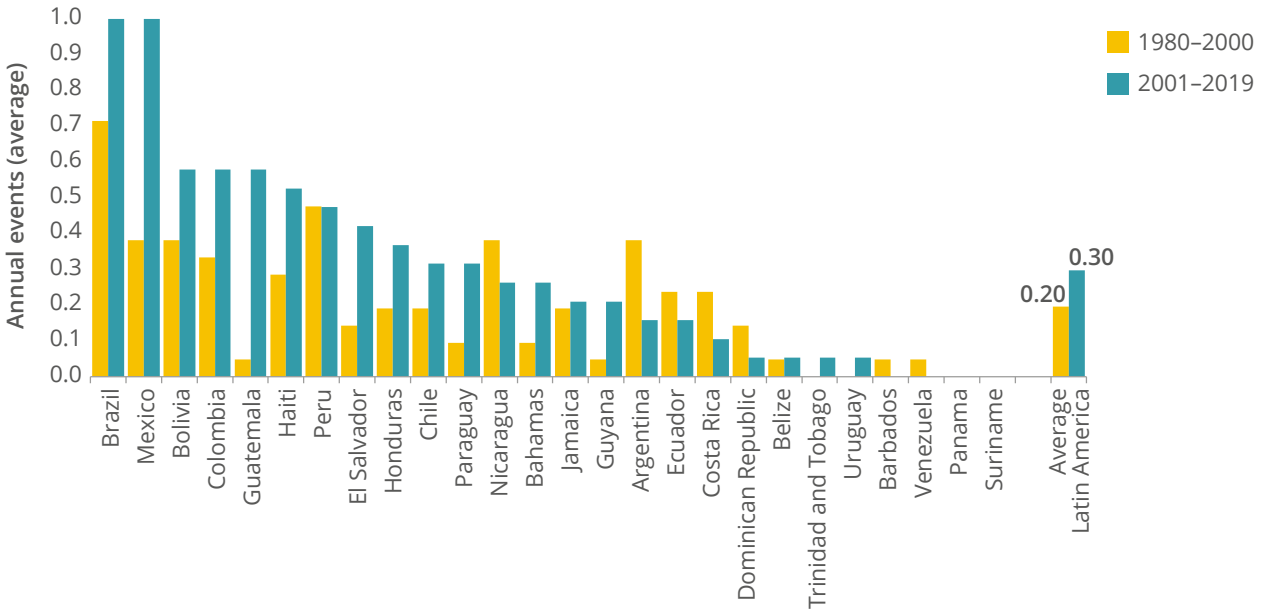
Climate change has led to increases in the number, frequency, and intensity of disasters (Mann et al., 2017; EASAC, 2018; USGCRP, 2018). Climate-related disasters are a significant challenge for Latin America and the Caribbean (LAC), a region with various countries that are among those most affected by climate events in recent decades.[5]

The annual frequency of extreme climate events[6] in the region has increased by more than 50 percent in recent decades. The annual average of extreme climate events in LAC rose from 0.20 annual events per country during the period 1980–2000 to 0.30 in 2001–19 (Alejos, 2021). According to the statistics, for countries that faced at least one climate event during both periods, the periodicity increased from one event every eight years (1980–2000) to one every five years (2001–19).

5 The Dominican Republic, Guatemala, Haiti, Honduras, and Nicaragua are among the 10 most-affected countries during the period 1994–2013 (Kreft et al., 2014).

6 "Extreme climate events" refers to those that fulfill one or more of the following criteria: (i) 100,000 or more people affected, (ii) 1,000 or more people killed, and (iii) economic damage of at least 2 percent of GDP.

Figure 2.1. Frequency of Extreme Climate Events in Latin America and the Caribbean, 1980–2019



Source: IDB estimates based on the EM-DAT database and Alejos (2018).

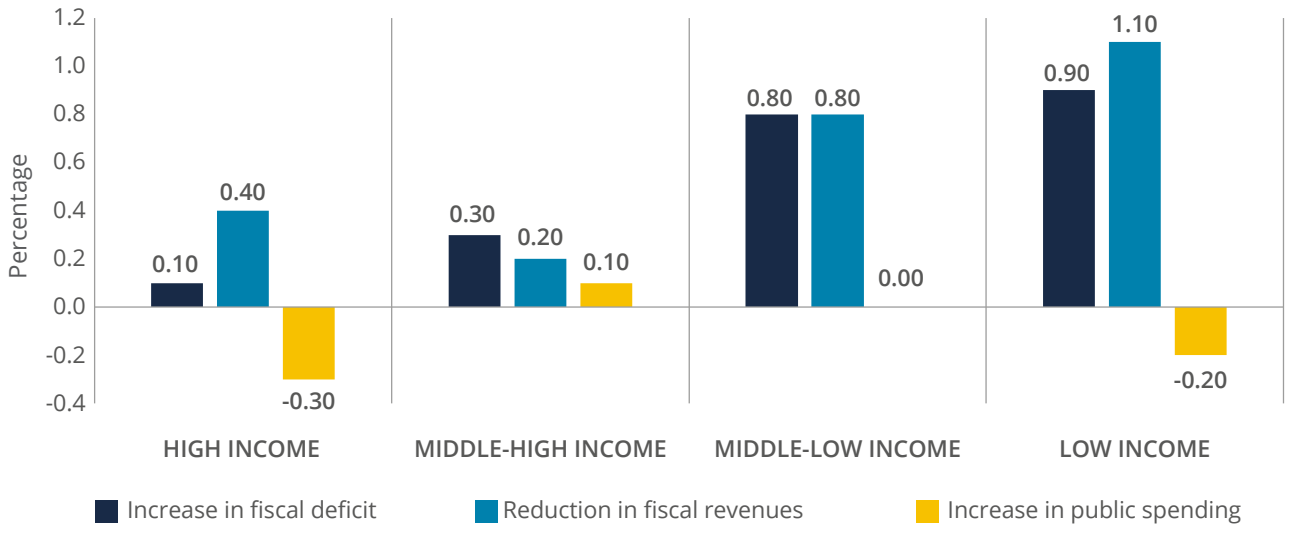
The magnitude, frequency, and duration of climate change–related disasters[7] have multiple impacts on public finances. For example, on the fiscal revenue side, a fall in economic activity due to the occurrence of extreme climate events has repercussions on both direct and indirect taxes, leading to a decrease in the tax base and, hence, tax collection levels. At the same time, on the expenditure side, a higher frequency of climate events tends to increase public spending due to costs of dealing with the emergency and subsequent reconstruction; moreover, it redirects resources already allocated to other activities in the budget and can cause delay or even abandonment of previously planned investments. As a whole, the potential impact of climate change implies greater pressure on the sustainability of public finances over the medium and long term due to a deterioration in the fiscal balance and a possible increase in public borrowing.[8]

The fiscal impact resulting from the occurrence of extreme climate events can be considerable and its materialization may affect fiscal consolidation efforts in the post-pandemic period. For example, on a global level, it is estimated that the occurrence of at least one event per year is associated with an annual increase in the fiscal deficit of 0.8 percent of GDP in lower-medium-income countries and 0.9 percent of GDP for low-income countries (Alejos, 2018). In a context of recovery in the wake of the COVID-19 pandemic, the materialization of this type of risk can impair the fiscal consolidation efforts needed in the region. Therefore, fiscal management of the negative effects of climate change–related natural disasters represents one of the most significant challenges that LAC countries must face in the coming years.

7 The types of climate change–related disasters are: (i) meteorological, such as storms, extreme temperatures, and hailstones; (ii) hydrometeorological, such as floods, landslides, and tidal waves; and (iii) climatological, such as droughts, glacier collapse, and forest fires.

8 For a full discussion, see Chapter 3 of Benson and Clay (2004).

Figure 2.2. Fiscal Impact of the Occurrence of Extreme Climate Events, by Group of Countries



Source: IDB calculations using the Alejos (2018) database.

Note: The sample includes 168 countries. The values indicate the average impact on the fiscal variable indicated by the occurrence of at least one extreme climate event per year.

2.2. Knowledge Gains and Benchmark Best Practices

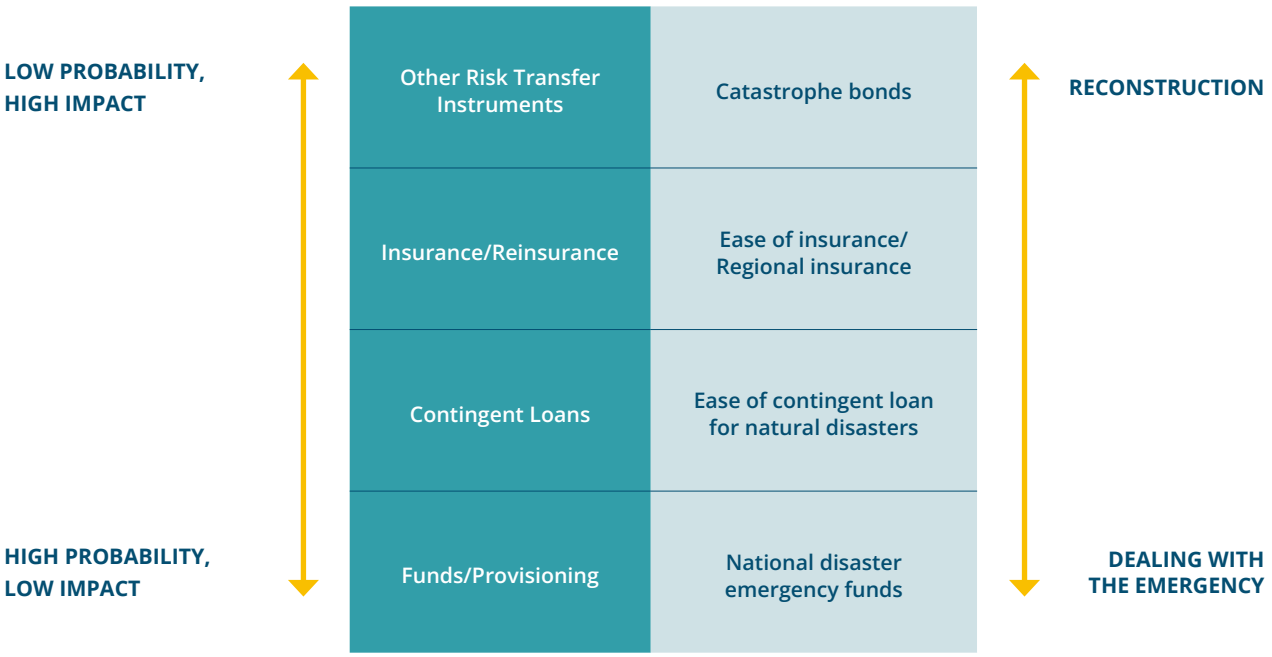
Although in the last 20 years LAC countries have implemented adaptation measures to reduce their vulnerability and increase their resilience, there are still several important challenges. From the point of view of adaptation, the fiscal challenges include developing financial strategies to implement countercyclical policies in the event of disasters, strengthening insurance mechanisms to offset the risk of catastrophic events, redirecting public investment towards resilient infrastructure, and using methodologies that can help to quantify and efficiently manage public spending related to climate change and natural disasters.

Financial strategies are fundamental when it comes to disaster risk management; however, not all countries have progressed in this area and there is room to strengthen implementation.

Some countries, such as Ecuador, El Salvador, Guatemala, Honduras, Mexico, and Peru, among others, have established financial management strategies to deal with the risk of disasters. These are strategic documents produced by finance ministries, which set out the lines of action in different areas: public spending, investment management, strengthening tax withholding instruments and risk transference, and the penetration of insurance schemes.

These strategies are implemented through different types of financial instruments such as emergency funds, contingent loans, insurance, and catastrophe bonds. Nonetheless, monitoring mechanisms should be further strengthened to identify progress in strategies and accountability and to provide more specific lines of action and detailed implementation pathways.

Figure 2.3. Financial Instruments for Fiscal Risk Management of Extreme Climate Events



One of the most commonly-used financial coverage mechanisms is natural disaster insurance. These instruments offer coverage against the materialization of natural disasters and catastrophes in exchange for the payment of a premium. In 2007, the Caribbean Catastrophe Risk Insurance Facility (CCRIF) was established; it was the first risk pooling fund formed by a group of countries. Likewise, it was the first insurance instrument to successfully develop parametric policies backed by traditional and capital markets. The CCRIF provides support to limit the impacts of disasters for both Caribbean and Central American governments by providing liquidity should the insurance policy be activated. This fund provides parametric insurance against tropical storms, earthquakes, and torrential rain and for activities in the fisheries sector. In 2014, the CCRIF signed an agreement with the Council of Finance Ministers of Central America, Panama, and the Dominican Republic (COSEFIN), with a view to encouraging these countries to join the fund, which Guatemala, Nicaragua, and Panama have already done.

Since its inception, the mechanism has made 54 payments amounting to more than USD 244.8 million to 16 member governments to offset damage caused by hurricanes, earthquakes, and torrential rain (CCRIF, 2021). These payments are determined on the basis of the coverage and the materialization of parameters defined in each insurance policy, including an estimate of the losses arising as a result of the disaster.[9]

Another instrument used by some countries in the region is so-called catastrophe bonds, which transfer the risk of the issuing country to investors. In 2006, Mexico was a pioneer in this area when it issued a catastrophe bond for USD 160 million to cover damages caused by an earthquake. Recently, the ministries of finance of the four Pacific Alliance countries pooled their efforts and, in 2018, launched a catastrophe bond that provides risk coverage differentiated by country: USD 500 million for Chile, USD 400 million for Colombia, USD 260 million for Mexico, and

9 Parametric insurance policies include a model for calculating losses and its activation is based on the intensity of the natural event, which permits a rapid disbursement of the insurance payouts should a disaster occur.

USD 200 million for Peru. The instrument offers coverage in places with the greatest vulnerability in the main metropolitan areas of each country (Pacific Alliance, 2018). The bond was originally issued to cover earthquake risks, but under the leadership of the Disaster Risk Management Working Group of the Pacific Alliance's Council of Finance Ministers (Grupo de Trabajo de Manejo de Riesgos Catastróficos del Consejo de Ministros de Finanzas de la Alianza del Pacífico) the countries are currently analyzing the possibility of a similar bond to include hydrometeorological hazards (Ministerio de Hacienda de Chile, 2020).

Countries have also employed contingent loans for catastrophes, generally granted by multilateral institutions. This type of loan functions in a similar way to a line of credit, with disbursements depending on compliance with a series of preestablished conditions: a parameter related to the climate event (type of disaster, intensity, location, etc.); a declaration of emergency; the existence of an integrated risk management program in the country; or the request being made within a certain period following occurrence of the disaster, among others. Along these lines, in 2009 the Inter-American Development Bank (IDB) created the Contingent Credit Facility for Natural Disaster Emergencies (CCF) amounting to USD 600 million, which grants loans of up to USD 100 million with disbursements activated at the moment the natural disaster occurs. Since its beginnings, the CCF has provided contingency funds for natural disasters to a value of USD 1.9 billion, which has helped to improve the beneficiary countries' capacities in the emergency response stage and to strengthen their financial resilience (IDB, 2020). Like the IDB, other multilateral development banks such as the World Bank and the Development Bank of Latin America (CAF) (Banco de Desarrollo de América Latina), previously known as the Andean Finance Corporation (CAF) (Corporación Andina de Fomento), have also established contingent financing for natural disasters.

Quantifying climate change expenditure helps to improve disaster risk management and permits greater transparency in the use of the resources earmarked for this purpose. Although this is an emerging practice for which no standardized methodologies yet exist, 10 LAC countries[10] already possess some kind of tagging or budget classification mechanism for identifying the resources involved in disaster risk management, an essential step that helps to evaluate the efficiency and effectiveness of the public policy response to the physical impacts of climate change. In this respect, it is worth highlighting Pizarro et al. (2022), a document prepared by the IDB that offers climate change budget tags and identifiers. This valuable tool helps to establish the conceptual frameworks and connections between financial and environmental classification systems by identifying the costs of mitigation and adaptation actions, as well as those arising from natural disasters.

The development of methodologies to quantify fiscal impact in the event of disasters, with a view to improving medium- and long-term planning, is still a pending task. Information relating to the fiscal impact of natural disasters is of limited availability and, when available, comparing different countries and periods is complicated. This information gap severely restricts the integration of disaster risk management into short- and medium-term fiscal planning, and even its incorporation into instruments such as the Medium-Term Fiscal Framework (MTFF).[11] The use of budget tags for disaster response expenditure represents progress, but there are still pending tasks to address such as quantifying the impacts on fiscal revenues and balancing the budget

10 Ecuador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Panama, and Peru.

11 Note that Colombia introduced contingent liabilities for natural disasters in its MTFF.

and public borrowing, on top of the opportunity cost associated with delaying or even cancelling investment projects as a result of the occurrence of climate change–related natural disasters. This type of information is crucial for understanding not only the magnitude of the impacts but also the channels of transmission of their effects. The IDB is developing a methodology of these characteristics and is currently testing a pilot version of the new instrument applied in the aftermath of Tropical Storm Agatha in Guatemala. The preliminary results of the exercise point to significant accumulated impacts between 2010 and 2013, on revenues (0.9 percent of GDP) and on capital expenditure (1 percent of GDP), including significant amounts of budget reallocation (0.5 percent of GDP), and on the fiscal deficit (1.8 percent of GDP) (Cabrera, 2021).

The incorporation of risk and vulnerability analysis into public sector investments is essential for increasing the resilience of public infrastructure. In medium- and low-income countries, the direct damages on power generation and transport infrastructure caused by floods, storms, and other natural disasters are estimated at around USD 18 billion per year (Hallegate, Rentschler, and Rozenberg, 2019). Part of these damages affects public infrastructure and can be managed by strengthening national public investment systems. In Peru, for example, the National System for Multiannual Programming and Investment Management (Sistema Nacional de Programación Multianual y Gestión de Inversiones) has incorporated minimum general contents for investment projects, which envisage the management of climate risks (Dammann, 2018). In other countries, such as Colombia, public investment projects must incorporate disaster risk analysis (Dammann, 2018). One fundamental aspect to remember is the subnational dimension, given that much of the public infrastructure at risk is the responsibility of local governments, particularly in countries with greater levels of decentralization (Eguino et al., 2020). In this sense, it is of primary importance to strengthen subnational institutions throughout the region, with the aim of improving their capacities to incorporate investment frameworks that promote the construction of resilient infrastructure.

The positive effect on GDP of investing in resilient infrastructure is well documented, and such investment can help to mitigate the indirect negative impact on fiscal revenues and public borrowing. The advantages are seen in both the multiplier effect of investment spending on economic activity and in the benefits accruing from a faster recovery after a natural disaster, with favorable repercussions for the tax base.

For Caribbean and Central American countries, the International Monetary Fund (IMF) calculates that as a result of investing in resilient infrastructure long-term GDP could increase between 2 percent and 6 percent in Caribbean countries and between 0.2 percent and 1.4 percent in Central American countries. It is likewise estimated that, three years after a disaster has occurred, the level of GDP could be 0.25 percent greater in the Caribbean and 0.1 percent greater in Central America, while the rate of public borrowing would fall by 0.75 percent and 0.25 percent, respectively (IMF, 2021).

2.3. Options to Continue Strengthening the Fiscal Disaster Risk Management Agenda

Finance ministries in LAC would benefit from adopting measures, methodologies, and new processes associated with financial management of the crisis provoked by climate change. Some of the most substantial benefits include:

1) **Adoption and implementation of methodologies to identify and quantify the main fiscal risks arising from extreme climate events.** The first step towards adequate management of the fiscal risks of climate events is to develop and apply methodologies for understanding the exposure and vulnerability to such events, as well as their impact on main fiscal aggregates: fiscal revenues, public spending, the fiscal balance, and public borrowing. This exercise could include compiling historical estimates that facilitate comparisons between different sectors and periods.

2) **Incorporation of fiscal risks into short- and medium-term fiscal planning.** To improve management, it is also necessary to strengthen the institutional diagnostic and fiscal planning capacities in the event of natural disasters. Tools that facilitate this process include the analysis of the main fiscal risks arising from extreme climate events in the MTFF,[12] the use of macro-fiscal models that include climate projections in the medium-term fiscal estimates, and the introduction of disaster-related escape clauses into fiscal responsibility laws.

3) **Development of financial disaster management strategies and methodological frameworks for their evaluation.** This permits informed decision making to strengthen and improve the capacities of public finances, focused on tackling the negative consequences of adverse climate events. The strategies must include lines of action regarding financial protection, taking into consideration estimates of the possible impacts of disasters, as well as different financial instruments for absorbing or transferring the risk. Such financial strategies should form part of a more integrated vision of disaster risk management, which incorporates frameworks of governance, regulatory actions, and evaluation frameworks for effective disaster risk management.

12 A good example of how this tool can be used is provided by the Medium-Term Fiscal Framework of Costa Rica.

Chapter 3

Climate Change Expenditure Policies and Management

Carlos Pimenta

3.1. Introduction and Key Questions

Incorporating the challenges of climate change into fiscal management is becoming increasingly necessary. As the International Monetary Fund (IMF) states in Climate-Sensitive Management of Public Finances (Gonguet et al., 2021), the aim of green public financial management (green PFM) is to adapt the existing practices of public financial management with a view to supporting climate-sensitive policies, both with regard to mitigation measures and adapting to climate change. The document describes a framework and a strategy for green PFM, emphasizing the need for an integrated approach, even beyond the budgetary cycle, which includes fiscal transparency and external oversight as well as coordination with state enterprises and subnational governments.

It is important to continue building consensus and applying new measurement and evaluation methodologies for climate change–related public spending.

Among the main challenges facing green PFM in Latin America and the Caribbean (LAC) are, on the one hand, the scarcity of common methodologies agreed at the international level and applied in the region's countries, which are useful when it comes to identifying and evaluating the environmental effects caused by public spending (both positive and negative). On the other, there is a noticeable lack of strategic planning and of an annual and pluriannual budget framework that envisages climate change with its corresponding allocation of public resources as well as proficient fiscal risk management.

From the public and fiscal policy perspective, it must be recognized that an increase in resilience and the transition towards a net-zero emissions economy implies transformations in all sectors, as well as establishing a long-term vision whose implementation begins in the present with public programs and projects that are consistent with this vision of the future. This forms part of the most significant challenges that good green PFM must consider. In other words, adequate management of public finances requires rules, mechanisms, processes, and controls that enable the decisions taken today regarding public programs and projects to avoid additional fiscal costs

from disasters and stranded assets while, at the same time, supporting an orderly, fair, and inclusive transition towards a carbon-neutral economy (Delgado, Eguino, and Lopes, 2021).

Green PFM practices are still in their infancy in the majority of countries, even in the most developed economies, although the application of these tools is growing.

According to the Organisation for Economic Co-operation and Development (OECD) report Government at a Glance 2021 (OECD, 2021b), 40 percent of OECD countries—that is, 14 of 35 countries—confirmed that they had applied green budgeting practices, and 9 countries indicated that they intended to do so in the future. According to the same publication, ex ante or ex post evaluations of environmental impact are conducted by 12 of the 14 countries that completed the survey (86 percent); environmental cost-benefit analysis was carried out by 10 countries (71 percent); evaluations of carbon emissions by 10 countries (71 percent); and carbon price-fixing instruments have been put into operation in 9 countries (64 percent). Finally, 7 countries out of 21 declared that they use green budget tagging (33 percent), and the majority of the countries (86 percent) that practice green budgeting have also set up channels of communication to divulge their efforts to the general public.

Although these numbers reveal that most countries that responded to the survey apply some kind of green budgeting tool, this represents, on average, less than 35 percent of the total member countries and reflects a much lower rate when all countries in the world are considered.

The majority of LAC countries still lack recent and consistent data regarding climate change spending. In consequence, the ministries of finance and economic planning are unable to evaluate the quality of the expenditure or be entirely certain of the fiscal risks arising from climate change impacts. In the region, only Ecuador, Honduras, Mexico, Nicaragua, and Peru possess a standardized classification mechanism or a budget tagging system that enables them to systematically and periodically search through the volume of budget resources, which are then channeled into actions to mitigate climate change, as referred to in the IDB paper Fiscal Policy and Climate Change: Recent Experiences of Finance Ministries in Latin America and the Caribbean (Delgado, Eguino, and Lopes, 2021).

As well as linking expenditure with the incidence of climate events, it is important to evaluate the results and impacts. Identifying public spending on climate change—both with regard to the factors that help efforts to combat global warming and to those that have a potentially negative influence—is not an end in itself but, rather, an inevitable step that countries must take in order to carry out evaluations and act to improve their efficiency, effectiveness, and equity (Pizarro et al., 2022). There is growing evidence to show that combating climate change does not only mean increasing expenditure; it also signifies redirecting the flows of both public and private finance in line with the Paris Agreement objectives (Galindo Paliza, Hoffmann, and Vogt-Schilb, 2022; CFTC, 2020; OECD, 2021a).

3.2. Advances in Knowledge and Best Practices

To adapt PFM to the requirements of climate change, it is essential to develop an integrated green fiscal strategy that includes the entire budget cycle. Green PFM does not require an entirely new approach to PFM but rather an adaptation of the existing processes and tools. One significant finding revealed by the literature (IMF, 2021; OECD, 2021a; and others) is that green PFM must cover the entire budget cycle: planning, preparation, approval, execution, production of balances and financial reports, evaluation, supervision, and independent audits (including the public investment budget management cycle).

In terms of scope, it is important to incorporate the entire public sector and extra-budgetary expenditures, on top of involving subnational governments and state-owned enterprises. These actors are often responsible for substantial greenhouse gas (GHG) emissions, face risks from the transition process or from the impact of disasters, and are responsible for carrying out investments and actions that help to build capacity for adaptation (for example, with regard to drinking water and drainage services).

In general, the reference literature focuses on analyzing the initiatives implemented by countries that form the basis for establishing common principles and best practices. Some of these include the following: (i) defining plans and strategies to help guide fiscal planning and to direct investment and decision making on revenues and expenditures; (ii) establishing a robust institutional design, in which the roles and responsibilities are clearly defined alongside the timeline for the required actions and deliverables; and (iii) producing tools that support decision making and strengthen monitoring, oversight, and accountability mechanisms (OECD, European Commission, and IMF, 2021).

Moreover, international experiences yield some lessons learned in terms of implementing green PFM strategies (Gonguet et al., 2021), such as: (i) the need to integrate reforms into the preexisting PFM program to guarantee that these are mutually reinforcing; (ii) the benefits of having strong political backing; (iii) ensuring that the key actors are on board, as well as training them in PFM processes; and (iv) demonstrating that the changes are progressing adequately.

Another fundamental concept is so-called green budgeting. According to OECD (2021b), the implementation of a green budget implies carrying out national climate change and environmental strategies linked to planning and budgeting tools that enable climate change spending to be allocated and evaluated and provide transparency throughout the process and for all the actors involved. The green budgeting tools most frequently used by the member countries are ex ante and ex post environmental impact evaluation, green budget tagging, environmental cost-benefit analysis, and evaluations of carbon emissions. These tools can contribute positively to better alignment of public financial management with the challenges of climate change, but appropriate management of the budget and of climate change–related fiscal risks must also consider an integrated public policy framework as part of green PFM in such a way as to address not only PFM but also a strategy of governance, with adequate legal and institutional frameworks, and to define roles, responsibilities, and requirements for governments for both mitigating and adapting to climate change.

The diagnostic tools available include the Public Expenditure and Financial Accountability (PEFA) methodology, which has recently expanded its scope by including a specific chapter on climate change. Applying PEFA in a country or subnational government helps to prepare a diagnostic and a plan of action to push forward a green PFM agenda. Increasingly applied in several countries, the PEFA methodology has the potential to become the framework of reference for such work in the coming years, considering the wide interest shown by governments in applying it and the value it has demonstrated in terms of consistency and comparability. Recent application of the PEFA methodology at the subnational level[13] highlights the usefulness of possessing an instrument that can make an accurate survey of the strengths and weaknesses of financial management, thereby establishing the basis for drafting a roadmap towards essential modernization and reforms.

The Inter-American Development Bank (IDB) has supported LAC countries in measuring climate-related expenditure and developing new methodologies. Although information is not available for the entire region, the IDB found that, in 2017, five LAC countries,[14] in five key sectors of their nationally determined contributions (NDCs) (energy, transport, agriculture, natural resources and environment, and disaster risk management), allocated between 1.1 percent and 3.3 percent of their total national budgets to actions to combat climate change. Nonetheless, in these same countries and sectors, the range of budgetary resources allocated to programs and projects with the potential to contribute negatively to climate change was blatantly much higher, at between 1.9 percent and 8.6 percent of the total budget (Ferro et al., 2020). The development and implementation of budget tagging and classifiers specifically related to climate change would help countries to generate the information needed to evaluate the efficiency and effectiveness of budget resources that affect the climate and determine their alignment with national climate strategies and goals. Some countries, however, still lack long-term climate change strategies to guide decision making and incorporate mitigation and adaptation criteria into the budget cycle, the cycle of investments, and other phases of PFM (Gonguet et al., 2021).

Additionally, the IDB offers sustained technical assistance to certain LAC countries, such as Costa Rica, Jamaica, and the Dominican Republic, in order to facilitate the establishment of budget tags and classifiers for identifying climate change–related expenditure. One of the lessons learned from this technical assistance is the importance of aligning the discussions of stakeholders with the annual budget in a gradual process that is sustained over time.

In some cases, countries may begin with a relation matrix linked to their current functional classification, which means that the end, the purpose, or the direction of each one of the functions can be expanded in terms of climate change, disaster risk management, and biodiversity. The use of a relation matrix expands the framework of information offered by the functional classifier, with a set of double-entry attributes and characteristics for expenditures and activities, which can help to identify and cross-check information between different categories as well as tag the purpose of the expenditure (principal or secondary), its incidence (positive or negative), the typology of activities, and classification of the categories, sub-categories, and classes of climate expenditure (Pizarro et al., 2022).

13 Such as in the Municipality of Chihuahua, Mexico.

14 Argentina, Colombia, Jamaica, Mexico, and Peru.

3.3. Options to Continue Strengthening the Green Public Financial Management Agenda

All LAC countries should identify their climate-related expenditure. To advance with green PFM and improve the effectiveness and efficiency of climate change spending, the region's countries must consistently and periodically identify these expenditures in their annual budget and thereafter monitor them, both to verify their execution and to evaluate their results and impacts.

A first step consists in preparing a diagnostic and a strategic plan for integrating climate change goals within the framework of green PFM. The diagnostic and a plan of action could be based, for example, on the climate chapter of the PEFA methodology, the new international standard mentioned above, which can help to identify a baseline, verify the unresolved gaps, and elaborate a comprehensive action plan for institutional capacity-building, process redesign, improvement of the regulatory framework, and the adoption of new management and evaluation tools, among other matters.

Identifying, monitoring, and evaluating climate change expenditure must include the entire budget cycle. Even prior to budget formulation, it is essential that fiscal planning should consider the risks of climate change. Preparing a green Medium-Term Fiscal Framework (green MTFF) could provide a useful tool at this stage, including a detailed analysis of the risks involved in the transition towards a carbon-neutral economy, with the provision that annual budget formulation remains aligned with this fiscal framework.

Adopting detailed functional classifiers also means that the identification of budget expenditure produces more robust values, is more efficient, and is based on better-quality data, according to the methodology proposed by the IDB (Pizarro et al., 2022).

It is imperative that evaluations of climate-related expenditure are used as feedback for the budget formulation process. In a complementary manner, as well as identifying and quantifying the climate-related budget expenditure, the results and the impact of such spending should be evaluated and used as feedback for the following year's budget formulation process. Countries that already employ results-based budgets (RbB) with program performance indicators could use these existing capacities and knowledge and apply them to evaluate major climate-related expenditures.

The final stage of the budget cycle includes producing green financial statements that permit information to be standardized in a way that is comparable with other countries and facilitates carrying out audits and inspections. Although this stage has yet to be developed in many of the extant methodologies, the International Public Sector Accounting Standards Board (IPSASB®) promotes dialogue regarding progress in these areas, for example, by incorporating the quantification of a country's natural resources into its accounting, among other aspects.

Transparency and independent oversight of green expenditure translates into robust accountability and credibility. Finally, in order to implement transparency, monitoring, and oversight mechanisms for climate-related public spending and countries' international

commitments, it is important to publish the evaluation results of this expenditure and of disaster risk management, thereby enabling society to participate in monitoring these disbursements.

Other lines of work consist in incorporating the analysis of these expenditures and results into the day-to-day business of independent fiscal institutions, or creating a specific climate change council, with the aim of institutionalizing permanent oversight.

Chapter 4

Green Procurement Policies and Management

Leslie Harper and Guy Edwards

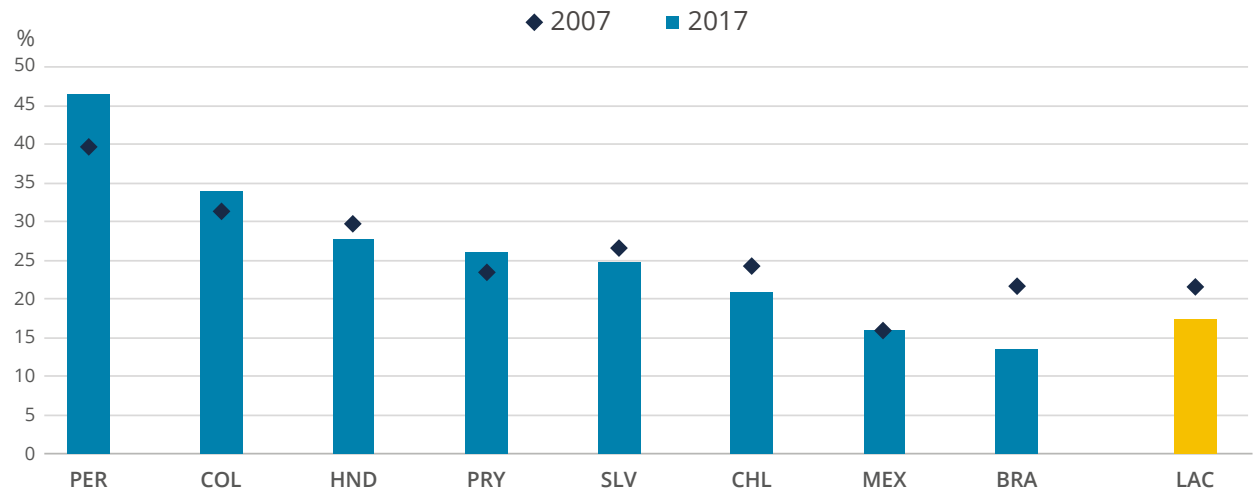
4.1. Introduction and Key Questions

Green procurement is defined as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured" (Commission of the European Communities, 2008).

As public procurement in 2017 represented, on average, 17.4 percent of the total expenditure of governments in Latin American and Caribbean (LAC) countries (Figure 4.1), the potential contribution that green procurement policies and management can have on reducing greenhouse gas (GHG) emissions, protecting the environment and human health and security, is high. This becomes particularly relevant in sectors in which public procurement represents a very significant percentage of the market, as in the case of the construction, health services, and public transport sectors (OECD, 2015, 2020).[15]

15 This share varied significantly between countries: Peru (46.4 percent), Colombia (34.0 percent), Brazil (13.5 percent), and Mexico (16.0 percent). Public procurement also represents a significant percentage of GDP. In 2017, it was equivalent to 6 percent of GDP in the LAC region. At the country level, it ranged between 3.6 percent in Mexico and 9.9 percent in Peru. See OECD (2020).

Figure 4.1. Public Procurement Expenditure as a Percentage of Total Government Expenditure, 2007 and 2017



Source: OECD (2020).

Governments either set or contribute to defining the rules that regulate public procurement, which means that any modifications made to procurement regulations have an enormous potential for tackling climate change at the institutional level. Some of the most obvious improvements might be changes made to prioritize the purchase of electric vehicles for public transport fleets, guaranteeing that all public buildings are energy efficient as well as climate resilient, or obtaining local and organic food for schools.

Due to the economic weight of the public sector, sustainable public procurement and contracting generate benefits in terms of the development of new technologies that can accelerate changes in patterns of consumption and the use of resources throughout society (European Commission, 2016; OECD, 2015).

Adopting green procurement policies and regulations presupposes significant challenges, among which are the following (IDB, 2018):

» **Lack of capacities.** In order for green procurement to be effectively implemented, the corresponding state agencies must employ personnel with the technical capacity to drive a new approach and work with enough suppliers capable of carrying out works or offering goods, services, or consultancies with the desired characteristics. It is particularly essential to develop the technical capacity needed to calculate the costs throughout the procurement life cycle, with the aim of clearly identifying the costs and, eventually, proclaiming the benefits when compared with traditional procurement.

» **Knowledge gaps.** There is unequal access with respect to the contribution made by management processes and state green procurement. Informative and awareness-raising actions should therefore be taken to promote the benefits of goods or services for buyers and end users and to define the priorities and values expected from management in public procurement, in order to effectively address the realities of management in a decentralized world.

- **Lack of environmental criteria in product or service development.** In general, public authorities and administrations lack criteria, certification systems, or verifiable comparative standards that enable environmental considerations to be incorporated into bids and calls for tender, beyond compliance with regulatory requirements and other sources of procurement regulations.

- **Conflicts of priorities.** To make decisions in terms of public procurement, policymakers and civil service procurement personnel must balance the traditional objectives in this field (efficiency, economy, or performance, among others) with the objectives of environmental sustainability.

- **Weak coordination.** In many countries, ministries or government entities execute environmental programs, but in a way that is not coordinated or aligned with the priorities of the procurement agencies, a situation that generally gives rise to inconsistencies between state procurement and the country's environmental objectives.

- **Impact on small and medium enterprises (SMEs).** In small countries with limited internal market capacity, it can be difficult to find enough green product providers. Therefore, when applying special green management criteria, care must be taken not to jeopardize the development of SMEs.

Finally, although the use of public procurement as a strategic political instrument is not a new concept, it is a tool that is being increasingly employed by public administrations.

Following the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, the countries of the Organisation for Economic Co-operation and Development (OECD) began to adopt sustainable public procurement (SPP) policies.

However, specific global measures regarding the promotion and implementation of SPP failed to materialize until 10 years later, at the United Nations World Summit on Sustainable Development in Johannesburg in 2002. This conference placed sustainable consumption and production (SCP) patterns at the center of the debate about sustainable development and called for the development of a global action framework on SCP, better known as the 10-Year Framework of Programs on SCP (10YFP), wherein SPP was one of six programmatic areas.

Likewise, OECD (2021b) affirms that the strategic use of public procurement can contribute to the Agenda 2030 for Sustainable Development by supporting an economy that is more efficient in the use of resources, provides stimulus for innovation, backs and encourages SMEs, and promotes social values. In recent years, citizens' expectations have risen with calls for greater responsibility in government decision making on procurement, which has increased the need to consider more wide-ranging results and multidimensional risks, even with regard to global supply chains (OECD, 2020).

On another note, OECD (2015) indicates that SPP helps to reduce the consumption of resources, such as public services or energy, and avoid the emission of waste and contaminants; increases the quality of the goods and services acquired; protects biodiversity; reduces the costs of environmental recovery and waste treatment; improves transparency; and permits better analysis

of the price-quality ratio when it comes to offers by private sector suppliers, while promoting innovation and green jobs and working strategically with suppliers.

The most common areas of public spending when it comes to implementing green procurement include goods (vehicles, office materials, fuel, etc.), services (electricity, food, data centers), and public works (airports, buildings, and power stations, among others) (OECD, 2015). Green procurement reveals the tremendous potential of public sector procurement for facilitating and driving incentives applied to both the supply of and the demand for goods and services without harmful environmental effects (Kumar Shakya, 2019).

There are various reasons why incorporating environmental strategies and perspectives into a country's public contracting systems can be beneficial. One reason is that environmental strategies can foster compliance with national policies and international commitments within the framework of the Paris Agreement. In 2017, three of the largest existing city networks—the International Council for Local Environmental Initiatives (ICLEI), the C40 Cities Initiative, and the Global Covenant of Mayors (GcoM) for Latin America and the Caribbean—also announced their interest in supporting SPP as part of their strategies to accelerate implementation of the Paris Agreement.

There are also environmental benefits of ecological procurement, such as reducing deforestation and GHG emissions and decreasing solid waste. For example, the European Union estimates that CO2 emissions could be reduced by 15 million tons per year if the EU were to adopt the criteria utilized by the city of Turku in Finland for procuring power supply and office equipment (European Commission, 2016).

Furthermore, green procurement is capable of generating significant governmental savings over time, given that green products use less energy, generate less waste, and last for much longer. Procurement carried out with environmental strategies and perspectives not only considers the price of acquisition but also the full costs of using and disposing of a good, which include its operation, maintenance, repair, and disposal. For example, equipping offices to ensure that energy consumption is efficient will be seen as an additional cost at the beginning but it will save energy in the future. Harper et al. (2021) show that the costs of efficient products such as computers, printers, and lighting are often significantly lower than the costs of using conventional products. An analysis of 11 LAC countries reveals that green procurement can generate economic benefits that range from USD 900,000 to USD 3.2 million for every 10,000 desktop computers during the cycle of use (five years) and from USD 14 million to USD 50 million for every 5,000 multifunctional printers during their useful life cycle (six years).

Finally, green procurement can bring political benefits. The potential savings from green procurement are attractive, given that resources are then freed up for other key public sector initiatives (European Commission, 2016).

Many countries have made progress on incorporating green procurement into their policies. The OECD (2021b) survey of 27 countries (26 OECD countries and Brazil) reveals that all the countries had a framework to support environmental objectives in public contracting. Likewise, 70 percent of

them possess a human rights framework, 41 percent have a framework for gender considerations, and 48 percent have established variables pertaining to the inclusion of minorities.

Significant progress has been made in putting green procurement into operation in the LAC region. According to a recent study, 20 of the 23 LAC countries surveyed have established a regulatory framework for public procurement that facilitates implementation of SPP. For their part, 21 countries have carried out implementation actions and 11 have specific tools, while 4 countries have put systems of measurement and monitoring into operation. Additionally, 3 countries have allocated specific budget funds for the implementation of SPP strategies. Finally, 19 of the 23 countries analyzed have policies aligned with the Sustainable Development Goals (SDGs) (OAS, IDB, and INGP, 2020).

The successful experiences in the region demonstrate the feasibility of adopting sustainability criteria in processes of public contracting while also achieving the desired objectives. An example of this is seen in the effort that many LAC countries make in terms of social and environmental sustainability, providing support for micro, small, and medium enterprises (miSMEs) through SPP (OAS, IDB, and INGP, 2020).

In the Caribbean, the strategic importance of public procurement at both the regional and the national level is beginning to be recognized; however, only a few countries have incorporated SPP objectives into their national legislation or developed a strategy or policies dedicated to green procurement. In Granada, Jamaica, and Trinidad and Tobago, as part of their efforts to modernize public procurement, legislative instruments have recently been incorporated pertaining to independent public procurement that include the economic dimension of SPP.

Public procurement in the Caribbean is also being used as a tool to implement environmental policies in order to achieve energy saving goals. This is true of the Barbados National Energy Policy 2017-37 (BNEP), which sets the goal of reducing energy use by 22 percent over the referred period. National initiatives to achieve this objective include the Barbados Energy Label (BEL) program, through which the Barbados National Standards Institute is now introducing energy efficiency labeling and benchmarking standards for domestic appliances and lighting.

There are numerous notable examples of legal arrangements related with SPP, such as Uruguay's Energy Efficiency Law No. 18,597 (Ley de Eficiencia Energética), which demands that buyers consider the costs of a product's entire life cycle: the purchase price, operating cost, waste management, and elimination of the product at the end of its useful life. For its part, Costa Rica, in Article 29 of the Integrated Waste Management Law (Ley para la Gestión Integral de Residuos), authorizes public procurement agencies to promote the acquisition and use of materials and products with little or no ecological footprint. Purchasers can use the technical specifications found on the ecological labeling while evaluation criteria are being developed to foster products that generate less waste (IISD, 2015).

Noteworthy subnational examples also exist. The German city of Ratisbona used ecological public procurement to contract public services, a strategy that helped to save EUR 10 million in energy and water costs over a period of 15 years. For its part, the Flemish Government of Belgium has set a goal that 100 percent of its procurement will comply with the sustainable procurement criteria defined for 2020.

4.2. Recommendations

Below are details of some of the critical factors for successful implementation of green procurement reforms:

- **Enjoying political support and leadership.** It is important to obtain the support of policymakers by taking affirmative action that means informing them about the advantages of adopting green procurement management systems and the costs associated with them (both monetary and environmental), instead of taking a lukewarm or negligent attitude to this issue. At the same time, implementing green procurement requires leadership and influential actors at high levels to promote and guarantee provision of the human resources and materials needed for execution, as well as for sharing best practices to acquire experience and generate continuous improvement processes.

- **Conducting market research.** Market research should be carried out to determine whether there are sufficient suppliers willing to satisfy operational needs and to provide information about the potential benefits of green procurement.

- **Raising consciousness and awareness.** It is important to inform on the basis of the evidence and to divulge and raise awareness of the opportunities that green procurement generates among the media, opinion leaders, SMEs, and current and potential suppliers.

- **Training.** Training is essential, particularly in the conceptual, legal, and technical aspects of green procurement policy implementation processes (product life cycle cost, sustainable use of products, etc.).

- **Monitoring and evaluation.** The use of monitoring and evaluation systems to measure results is fundamental for tracking progress as well as identifying possible areas of improvement.

- **Establishing methodologies and tools** for evaluating environmental impact and estimating the emissions caused by public procurement.

4.3. Policy Options for Strengthening the Green Procurement Agenda

The region's countries can benefit by formulating diagnostics, developing tools, and building the institutional capacities needed to promote green procurement. Two methodologies and tools that are potentially useful for decision makers are particularly worth highlighting:

- **The Public Expenditure and Financial Accountability (PEFA) climate module.** This diagnostic tool helps to establish the extent to which climate issues are integrated into the rules, processes, and systems of procurement management. This instrument helps to determine the point to which government may procure goods, services, and works that produce climate-negative impacts, evaluate the resilience and response capacity of the procurement system to

climate change–related risks, and identify government capacity to respond to disasters caused by climate change.[16]

- **The Methodology for Assessing Procurement Systems (MAPS)[17] sustainability module.** This instrument can detect areas of reform and modernization to promote green procurement within the framework of government procurement systems.

Based on previous diagnostics, finance ministries can take certain actions to promote sustainable or green procurement (OAS, IDB, and INGP, 2020; OECD, 2015), such as:

- Establishing a legal and policy framework for green public procurement to help procurement agencies incorporate the climate dimension into their contracting procedures.
- Elaborating a green procurement strategy, linked with national development plans, that includes goals and indicators to measure progress.
- Carrying out a market study to identify and understand the potential supply of sustainable or green products.
- Introducing environmental rules into technical specifications, procurement selection, and adjudication criteria, as well as into contract execution clauses and benchmark products.
- Strengthening the economic sectors that, operating from the private sector, are creators of innovation and development that can minimize the gaps and challenges of sustainability.
- Designing a training plan for all the actors and sectors linked to public procurement, including the public and private sectors.
- Deploying a communication strategy and conducting awareness-raising campaigns about the benefits of green procurement in order to garner political support from the private sector, the media, and public opinion, as well as the acceptance of civil society.

Finally, regular studies must be produced that offer empirical evidence about the cost-benefit ratio of green procurement and the savings and potential fiscal impact of this type of strategy, as well as the relationship between such procurement and the strengthening of local enterprises and innovation.

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16 The Public Expenditure and Financial Accountability (PEFA) methodology for evaluating public financial management (PFM) for climate change contains the PEFA Climate Framework, an independent, recently developed module for evaluating the PEFA diagnostic that is currently in the piloting stage. Special attention should be paid to the indicator relating to green procurement (GFPCC-8), which contains four climate-sensitive dimensions: framework, operations, monitoring, and public procurement reporting. For more information, see https://www.pefa.org/resources/climate-responsive-public-financial-management-framework-pefa-climate-piloting-phase.

17 The Methodology for Assessing Procurement Systems (MAPS) is a tool for evaluating public procurement systems. MAPS enables the implementation of more efficient reforms to improve public procurement systems by showing which aspects of the procurement are performing adequately and which areas require improvements. MAPS includes complementary modules, such as one on sustainable procurement. For more information, see https://www.mapsinitiative.org/methodology/EN-MAPS-supplementary-module-SPP.pdf.

Chapter 5

Climate Change and Public Investment Management

Huáscar Eguino

5.1. Introduction and Key Questions

Public investment can be a powerful instrument for achieving greater resilience in the face of severe climate events and advancing towards a decarbonized economy. However, for public investment to perform this role, it must be aligned with national adaptation and decarbonization strategies and goals, adopt sustainability criteria in preparing and executing infrastructure projects, and create mechanisms to facilitate funding of public infrastructure using new forms of green or climate financing. This chapter begins by presenting the main challenges that Latin American and Caribbean (LAC) countries face when it comes to integrating climate action into public investment management, then reviews the most notable international experiences in this field, before proposing possible courses of action to enable the region's countries to progress towards resilient and low-carbon public investment.

5.1.1. The Need to Align Public Investment with the Challenges of Climate Change and Transition

The Inter-American Development Bank (IDB) estimates that in order to tackle the climate crisis, expenditure on infrastructure services provision must be between 2 percent and 8 percent of GDP, while expenditure to address diverse social challenges will represent between 5 percent and 11 percent of GDP. These estimates indicate that between 7 percent and 19 percent of annual GDP will have to be aligned with the Sustainable Development Goals (Galindo Paliza, Hoffmann, and Vogt-Schilb, 2022). Given the magnitude of the resources required to address such needs, LAC countries must make efforts in three directions: (i) redirecting existing resources and establishing new investment priorities that favor resilient, low-carbon infrastructures that make use of natural capital; (ii) improving the quality of public investments by adopting sustainability criteria in their design and implementation; and (iii) expanding the availability of financial resources by building sustainable projects portfolios that can be financed by investors interested in environmental, social, and corporate governance (ESG) aspects.

The impacts of extreme climate events materialize in loss of infrastructure that must be reconstructed using resilience criteria. Most LAC countries are seeing an annual increase in the number of severe climate events. The annual frequency of these events in the region has increased by more than 50 percent in recent decades, rising from 0.20 annual events per country during the period 1980–2000 to 0.30 in 2001–19. For countries that faced at least one climate event during both intervals, the occurrence was higher, rising from one event every eight years (1980–2000) to one every five years (2001–19) (Delgado, Eguino, and Lopes, 2021). At the regional level, the impacts caused by floods, storms, and other natural disasters led to significant losses of infrastructure and public services. For example, in 2020, Hurricane Eta made landfall on the Central American isthmus and the south of Mexico, mainly affecting Guatemala and Honduras, with a total amount of USD 6.8 billion in economic damages (Alejos, 2021). On top of the infrastructure losses caused by such climate events, public investment is a long way away from contributing to the decarbonization goals undertaken by countries within the framework of the Paris Agreement.

At the global level, it is expected that the production of fossil fuels will increase by an average of 2 percent annually, a figure that represents more than double the production levels compatible with the 1.5°C warming objective set out in the Paris Agreement for 2030. This situation illustrates the lack of alignment of public and private investments with the goals of the Paris Agreement and the nationally determined contributions (NDCs), particularly in the energy, transport, agriculture, and urban development sectors. In this context, LAC countries now face the difficult decision of either continuing to make investments that impact negatively on the environment and increase greenhouse gas (GHG) emissions or committing to an orderly and fair energy transition. This latter option presents an opportunity to boost GDP in the region's countries by 1 percent annually and create 15 million new jobs by 2030, according to the IDB 2021 macroeconomic report (Cavallo and Powell, 2021).

5.1.2. The Need to Integrate Climate Action with Public Investment Management

Generally speaking, one of the main challenges in aligning public investment with the goals of the Paris Agreement and the NDCs is that public investment management does not include instruments or tools that integrate climate action into the planning and investment prioritization processes, into ex ante project evaluation, or into the funding of sustainable infrastructure strategies. According to two studies of LAC public investment management efficiency (Armendáriz and Contreras, 2016; Eguino et al., 2020) and a recent survey regarding the integration of climate action into public investment management (Aguilar, 2021), the situation is as follows:

- **Public investment planning instruments are extremely weak.** This weakness has a significant impact on the alignment of investment programs with national decarbonization commitments and with priorities in terms of resilience that, by their very nature, require a medium- and long-term programming vision. In effect, according to the public investment management index calculated for 16 LAC countries, the average score in terms of the use and application of planning instruments is 1.97, on a scale of 4 points. These figures indicate the pressing need to reinforce the strategic and planning framework that serves to direct the allocation of public investment resources.

- **With the exception of Colombia, LAC countries still lack green project taxonomies to provide guidance for public and private investors.** These taxonomies are tools that can help to classify economic activities and assets according to their contribution to the achievement of environmental objectives and their contribution to national commitments and strategies in this area. Such tools are important because they incorporate a set of definitions designed to support different actors from the public and private sectors—such as bond issuers, investors, financial institutions, or public entities, among others—in identifying and evaluating investments that can bolster compliance with the environmental objectives set out by the country. In other words, these instruments facilitate ex ante identification and evaluation processes and help to prioritize projects on the basis of sustainability criteria. In LAC, only Colombia's Treasury Ministry (Ministerio de Hacienda) has approved the use of this tool (in 2021), but Chile, the Dominican Republic, and Mexico are already in the elaboration process.

- **The region lacks project prioritization tools or models.** Except for Costa Rica and Mexico, the region's countries lack the instruments that would enable projects to be prioritized according to their contribution to climate change mitigation or adaptation. Even in the aforementioned cases, application of these tools is still incipient and is used only in a subset of investment programs (Delgado, Eguino, and Lopes, 2021).

- **The use of methodologies for investment project preparation and evaluation is still in its infancy in the region.** In a survey of 16 LAC countries regarding the quality of public investment management, it was found that the project preparation and evaluation dimension scored an average of just 0.86 points out of 4 (Armendáriz and Contreras, 2016), which indicates that the majority of LAC countries suffer from serious deficiencies in an area that is central to public investment quality. Similarly, in a survey completed by the IDB towards the end of 2021 (Aguilar, 2021), it was found that only two LAC countries (Chile and Peru) use social pricing for carbon during ex ante investment evaluation and only three systematically include climate event risk analysis in their ex ante evaluation of public projects.

- **Access to green financing for investments in sustainable infrastructure is limited.** The scant integration of the climate dimension into investment project management significantly restricts the capacity to build potentially attractive project portfolios for capturing green or sustainable investments. As previously mentioned, there is a yawning gap in infrastructure financing in the region and, as investment needs greatly exceed the public resources available, private investment must be catalyzed and the conditions and capacities generated to access green financing. From the public investment management perspective, these conditions include managing physical and transitional risks as part of investment programming, determining funding strategies for decarbonization and resilience, adopting green project taxonomies, and integrating the climate dimension into project cost-benefit analysis.

5.2. Recent Experiences and Best Practices

This section includes a rapid review of recent experiences and best practices for integrating climate action into public investment management. Specifically, three central aspects of this integration are covered: (i) the use of infrastructure plans, taxonomies, and prioritization criteria for allocating public investment resources; (ii) the use of investment management techniques and instruments that allow climate action to be incorporated into the project preparation and evaluation cycle; and (iii) the management instruments used to facilitate access to new resources for investments, such as climate or green financing strategies.

- **Planning resilient infrastructure.** To achieve greater infrastructure resilience to climate events (hurricanes, droughts, floods, landslides, and others), it is necessary to integrate the management of physical risks into the investment planning processes. A best practice currently employed by multilateral development banks (MDBs) is to require project documents to adhere to the following guidelines: (i) identify the context of vulnerability that the project faces, (ii) describe how the project will deal with the risk and vulnerability factors, and (iii) incorporate specific activities to achieve greater resilience for the investments (AfDB et al., 2021). At the country level, a good example of how climate risks can be integrated into planning processes is shown by Costa Rica's national investment plan for 2015–18, which establishes that infrastructure projects must comply with basic resilience criteria (OECD, 2018), alongside an analysis of potential risks from natural disasters (Delgado, Eguino, and Lopes, 2021). For its part, Chile has developed and applied a methodology for identifying and monitoring public investments, with an emphasis on adaptation, mitigation, and mixed effects (Córdova et al., 2021), while it already has a methodology for evaluating physical risks in infrastructure projects and a climate change adaptation plan for its cities (Ministerio de Desarrollo Social y Familia (Chile), 2022; Ministerio de Vivienda y Urbanismo (Chile, 2018).

- **Sustainable/green investment taxonomies.** Best practices for aligning investments with decarbonization strategies indicate the importance of establishing robust green taxonomies, among other objectives, to help prevent investments from turning into stranded assets or failing to advance decarbonization (so-called green washing). As already mentioned, green taxonomies are methodological instruments that help identify sustainable investments (World Bank, 2020). Countries, geographical areas, and international agencies that already possess these kinds of instruments include Bangladesh, China, the European Union, Indonesia, Mongolia, and the Climate Bonds Initiative (CBI).

A comparative study of the aforesaid taxonomies (World Bank, 2020) reveals the following shared characteristics: (i) the taxonomies were established to facilitate access to green financing; (ii) the main users are MDBs, financial institutions, and investors; (iii) the sector scope of the taxonomies is restricted to the needs of users; and (iv) national taxonomies are more closely linked to environmental goals than to climate change objectives.

The LAC countries that have recorded the most progress in terms of planning and use of taxonomies for directing public and private investments are Costa Rica and Colombia. Costa Rica has begun to modernize its public investment system by incorporating the use of taxonomies to facilitate alignment of investment projects with its National Decarbonization Plan objectives, the application of sustainability criteria for preparing and prioritizing public investments, and the integration of social

carbon pricing in project preparation and evaluation manuals (Aguilar, 2021). For its part, Colombia has established a green taxonomy that defines a system for classifying economic activities and assets that make substantial contributions to achieving the commitments, strategies, and policies set out by the country on environmental matters (Government of Colombia, 2022).

- **Integrating climate action into project evaluation methodologies.** The inclusion of social carbon pricing into ex ante public project evaluation is still an incipient practice in LAC countries. Its adoption is important for internalizing the socioeconomic costs of GHG emissions in cost-benefit analysis, although consensus opinion suggests that this tool cannot be used on its own given that it carries the risk that projects that make marginal contributions to reducing emissions will be executed, in detriment to a decarbonized economy.[18] In LAC, Chile's National Investment System (Sistema Nacional de Inversiones) has already introduced the quantification of GHG emission externalities into its project cost-benefit evaluation methodologies. In this case, applying a social price for carbon to ex ante project evaluation has been gradually implemented, starting with public buildings and energy projects and thereafter incorporating transport, sewage, and solid waste projects. Peru also estimates a social price for carbon and publishes a guide for its use in the social evaluation of investment projects, including practical cases in the sectors of renewable energy generation, waste water treatment, landfills, and biogas capture and burning systems (MEF, 2021). One of the challenges faced when implementing this tool is the difficulty of quantifying GHG emissions from investment projects; this is one of the reasons its application has been introduced only gradually and in areas in which better knowledge regarding the quantification of emissions is available.

- **Establishing financial climate strategies.** The best international practices indicate that, as well as integrating climate action into planning and public investment management, countries must develop financial climate strategies that facilitate access to green or sustainable financing.

An outstanding example in LAC is seen in Chile's Climate Financing Strategy (Estrategia de Financiamiento Climático) (Ministerio de Hacienda de Chile, 2020), which includes: (i) generating information, data, and analysis to mobilize capital flows that are coherent with the country's climate goals, economic growth priorities, fiscal responsibility, and long-term sustainable development; (ii) designing and implementing green financial instruments and encouragement for markets to help develop resilient and low-carbon economic sectors; and (iii) strengthening capacities in the financial sector in terms of the risks and opportunities arising from climate change.

Establishing this strategy has helped Chile to become the leading sovereign issuer of green bonds in the LAC region, raising finance amounting to more than USD 6.2 billion before 2020 for the implementation of a project portfolio consistent with its international commitments in terms of emissions reductions (Delgado, Eguino, and Lopes, 2021). Other notable experiences from outside the LAC region include the United Kingdom's Green Finance Strategy (HM Government, 2019) and the French Strategy for Green Finance (Lemmet and Ducret, 2017).

18 For example, projects that aim to switch from coal to natural gas power generation may have an impact on reducing emissions, but they are not consistent with decarbonization.

5.3. Guidelines for Strengthening the Integration of Climate Action into Public Investment Management

Some of the actions that can be taken to integrate climate action into public investment management include making an assessment of public investment systems (for example, by applying the C-PIMA tool developed by the International Monetary Fund [IMF]),[19] preparing plans for strengthening the agencies responsible for public investment management, and putting into operation a set of actions aimed at integrating climate action into public investment management. Specifically, the following lines of action are recommended to integrate the climate dimension into public investment management:

- **Link public investment programming with national decarbonization and resilience strategies.** Greater integration and consistency must be sought between pluriannual public investment programming and national adaptation or decarbonization strategies and plans. Countries should therefore: (i) establish decarbonization and resilience plans and strategies that can help to encourage public and private investments; (ii) adopt or develop green investment taxonomies to identify investments with the greatest positive impact in terms of climate change; (iii) apply instruments for prioritizing and selecting investments based on sustainability criteria; and (iv) implement strategic management of the physical and transitional risks linked to existing and new infrastructure.

- **Integrate climate action into public investment project management.** The integration of climate action should be sought throughout all the stages of the project cycle. This includes: (i) supporting and putting into operation sector-based infrastructure plans that are aligned with adaptation and decarbonization goals, with a view to helping identify new projects and avoid making investments that, while marginally reducing emissions, increase the risk of stranded assets; (ii) incorporating the analysis and management of physical risks into infrastructure project evaluations; (iii) estimating and applying social carbon pricing to ex ante project evaluation; (iv) introducing resilience criteria into sustainable infrastructure projects; and (v) evaluating the impact of sustainable infrastructure on the different dimensions of sustainability.

- **Facilitate access to green financing for sustainable infrastructure.** This implies: (i) establishing national climate financing strategies consistent with macroeconomic fiscal sustainability objectives; (ii) including climate and transitional risks in financial regulation; (iii) improving information systems to ensure greater transparency, effectiveness, and reporting of the use of green financing in public projects; and (iv) building public and private institutional capacities in terms of sustainable infrastructure and green financing.

19 The C-PIMA is the climate module for the IMF's Public Investment Management Assessment (PIMA) system. For a description of this module, see IMF (2021).

Chapter 6

Carbon Pricing, Subsidy Policies, and Tax Agenda

Raúl Delgado, Huáscar Eguino, and Alejandro Rasteletti

6.1. Introduction and Key Questions

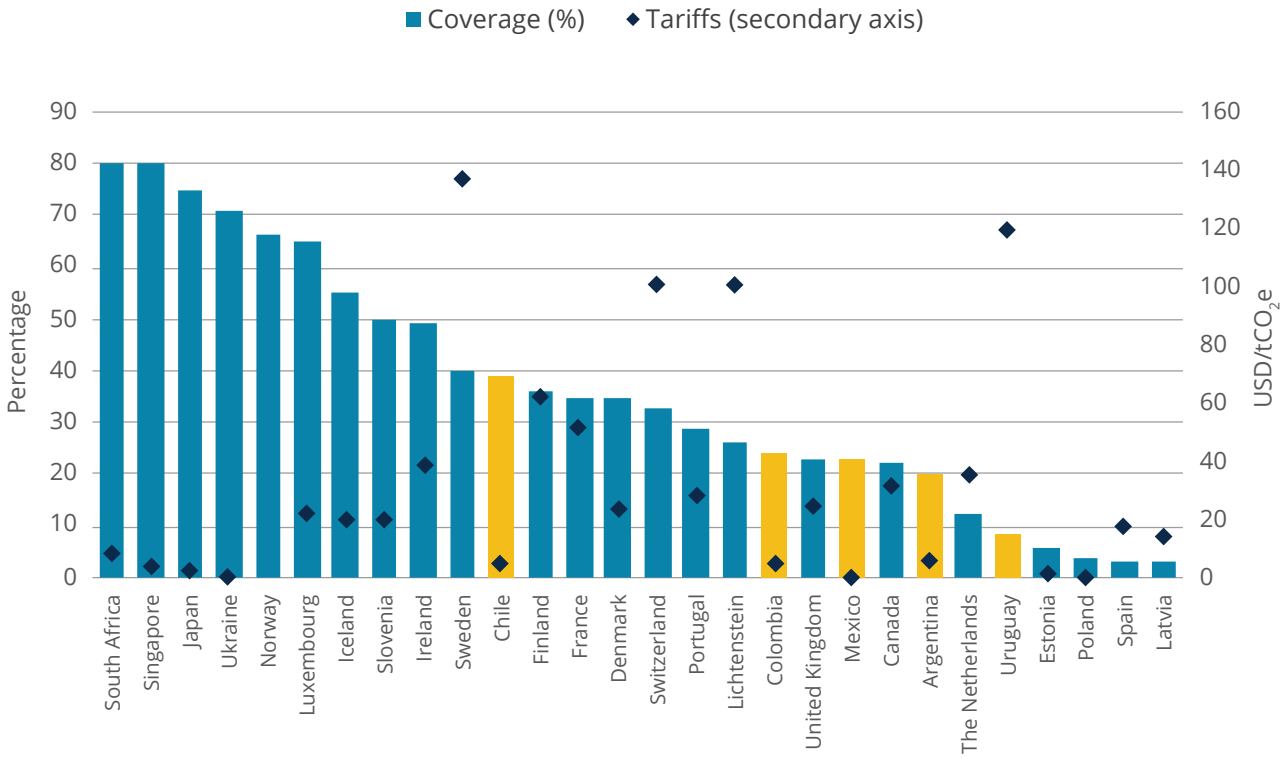
The pricing system can either hamper or help a country's greenhouse gas (GHG) emissions reduction strategies. Price signaling can incentivize changes in the type of investments made by the private sector, which means that, when applied, subsidy policies and taxes should also be considered. In effect, as previously shown in Chapter 2, the Latin American and Caribbean (LAC) region still spends around USD 60 billion (Parry, Black, and Vernon, 2021) on subsidies. Eliminating these would signify: (i) removing an obstacle to the adoption of green technologies, (ii) ending the distortions that cause artificially low fossil fuel prices, and (iii) achieving significant savings for public finances. Correcting these distortions must be a key issue when it comes to considering government options for intervening in carbon prices.

In many LAC countries, fixing efficient prices for carbon emissions means reducing fossil fuel subsidies. Various countries of the region pay high subsidies to keep fuel prices down. In 2018, fuel subsidies in the region reached 1.1 percent of GDP for the average country, a percentage well above the world average of 0.7 percent of GDP (Conte Grand, Rasteletti, and Muñoz, 2022). The combination of low taxation and high fuel subsidies meant that LAC is now the region of the world that collects the second-lowest amount of tax revenue from fossil fuels (see Figures 6.1 and 6.2). In 2018, the world average net tax revenue was 0.7 percent of GDP, while in LAC countries tax revenue represented just 0.06 percent.[20] Although it might be desirable to increase net taxation on fossil fuels to increase the cost of carbon emission, reforms to correct these distortions have been difficult to implement due to the potential political costs and the social and economic impacts that such reforms would bring (Feng et al., 2018; Schaffitzel et al., 2019).

20 The LAC data are distorted by the high subsidies paid in Venezuela, which are estimated at 11.6 percent of GDP for 2018. Excluding Venezuela, average subsidies in the region reach 0.65 percent of GDP, while net taxation stands at 0.46 percent.

It is therefore fundamental to consider the challenges faced by economic policies based on price reforms, and reflect them in the design of such reforms, with the aim of including the progressive implementation of measures, compensation for vulnerable families and firms, public consultations, and the importance of conducting the respective communication strategies (IMF, 2019a).

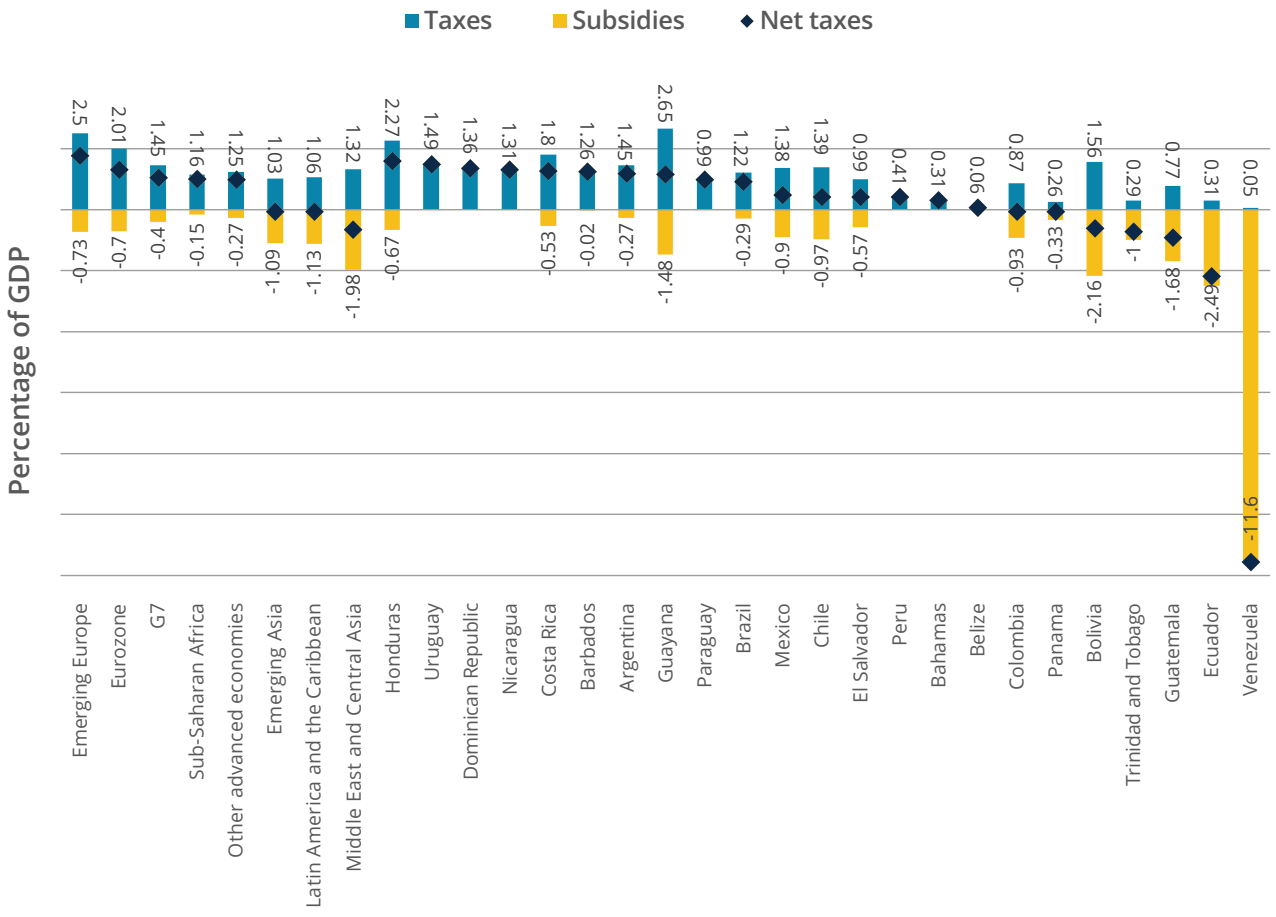
Figure 6.1. National Carbon Taxation (coverage and tariffs)



Source: World Bank (2022).

Note: The prices for Denmark and Iceland correspond to fossil fuels. For the case of Finland, the tax on fuels for use in transport was used. The Uruguay data is estimated based on information from EDGARv6.0, Crippa et al. (2021), and the share of naphtha in total fuel consumption.

Figure 6.2. Taxes, Subsidies, and Net Taxes on Fossil Fuels (percentage of GDP)



Source: Conte Grand, Rasteletti, and Muñoz (2022).

Economic theory frequently suggests that carbon taxes can provide a powerful tool for reducing emissions (Nordhaus and Boyer, 2000). However, in practice, this potential benefit has had a very limited impact and has shown that, when applied in isolation, taxes alone are not enough to drive the transition towards decarbonized economies. The transition to carbon neutrality does not consist of marginally reducing emissions—for example, with incentives to use existing gas power stations instead of coal-fired power stations, or reducing the use of automobiles—but, rather, in investing in the technology and the infrastructure needed to advance towards net-zero emissions (Vogt-Schilb, Meunier, and Hallegatte, 2018).

The empirical evidence also shows that the carbon pricing mechanisms used throughout the world have led to marginal reductions in emissions but have failed to have a significant impact on the investments required for the transition towards net-zero emissions (Lilliestam, Patt, and Bersalli, 2020).

The lack of adequate infrastructure, the absence of regulations to promote green technologies, and the lack of information and insufficient capacity are some examples of the institutional and market failures that can be as, or even more, important than the absence of carbon pricing.

6.2. Recent Experiences and Best Practices

While they are complicated to implement, fuel subsidy reforms offer a dual benefit: they improve the efficiency of public spending while also helping to reduce emissions. Various studies have employed general equilibrium models to analyze the impacts of reforms aimed at reducing fuel subsidies, and it has been observed that these reforms generate significant benefits in terms of emissions reductions. For example, Merrill et al. (2015) use a general equilibrium model to simulate the elimination of fossil fuel subsidies in 20 countries and observe an average reduction of GHG emissions of around 11 percent. Another estimate suggests that up to a quarter of the commitments made within the framework of the Paris Agreement could be achieved by reforming fossil fuel subsidies (Jewell et al., 2018). The majority of these reductions in emissions would correspond to fossil fuel–exporting countries and regions such as Russia, the Middle East, and Latin America.[21] For their part, Coady et al. (2019) maintain that reforming the establishment of efficient prices for fossil fuels would lead to an annual reduction in carbon emissions of up to 28 percent and would boost public revenues by nearly 3.8 percent of GDP. Despite the potential benefits in terms of lower emissions, international experience indicates that measures to reduce fossil fuel subsidies face significant difficulties when it comes to implementation, such as the possible impacts on inequality and poverty (Feng et al., 2018). In virtue of these difficulties, diverse researchers have identified best practices to make the reform of such subsidies feasible. Among them, the following best practices are worth mentioning (Skovgaard and van Asselt, 2018): (i) intervene in reforming the subsidies at the right time, whether when fuel prices are low, when opportunities arise from political popularity, or during broader reform processes in the energy sector; (ii) make sure that a wide range of stakeholders, as well as different sectors of the government, are involved at an early stage; (iii) communicate effectively regarding reform of the subsidies, providing information about the amounts of subventions and how the funds disbursed for these subsidies could be redirected for other purposes; and (iv) implement compensatory measures for the main stakeholders affected.

Some carbon price-fixing instruments, such as taxes and carbon credit trading markets, could form part of wider and more integrated decarbonization strategies; however, up until now, results have not been particularly encouraging. Carbon taxes are currently applied by 35 governments at the regional, national, and subnational levels[22] (Table 6.1).

21 Jewell et al. (2018) mention that, in some regions, emission reductions can be low or emissions may even increase as a consequence of greater coal consumption or due to the import of gas from countries that continue to provide subsidies.

22 See World Bank (2022a).

Table 6.1. Carbon Taxes around the World

Jurisdiction	Number of initiatives	Emissions covered (GtC CO_2e)	Emissions covered (percentage of global GHG emissions)	Taxes collected (billions of USD)
Regional	0	0.0	0.0	0.0
National	27	2.93	5.4	25.58
Subnational	8	0.06	0.1	1.42
Total	**35**	**2.99**	**5.5**	**27.0**

Source: World Bank (2022).

In LAC, only five countries levy a tax on carbon.[23] These taxes evince design deficiencies[24] and low tax rates[25] (Forero, Rasteletti, and Urrea, 2022), which reduces their revenue collection effectiveness and their potential to reduce carbon dioxide emissions. There are various reasons for this, such as the relatively low rate of tax on fuel (Conte Grand, Rasteletti, and Muñoz, 2022) and the fact that in many countries[26] the taxes on energy goods and services also benefit from similar subsidies. In any case, the absence of carbon pricing is just one of the deficiencies that affect the political climate, and there is no evidence to confirm that fixing the price of carbon by itself, at politically plausible levels, results in significantly lower emissions (Stock, 2019). A review of the available studies regarding the impact of high carbon prices in the EU, New Zealand, the Canadian province of British Columbia, and in Scandinavian countries demonstrates little or no evidence about its effectiveness in promoting either innovation or the use of appropriate technologies to make the transition towards net-zero emissions (Lilliestam, Patt, and Bersalli, 2020). In the best of cases, the studies show that these instruments only generate operational (that is, marginal) adjustments over the short term, but have no effect on technological changes.

Despite the broad arguments in favor of carbon pricing and the more than 50 price-fixing mechanisms either implemented or planned throughout the world (World Bank, 2019), their use continues to be slow and difficult. The main lessons learned in terms of implementation of these prices are the following (Price, 2020):

23 The countries that impose a carbon tax in LAC are Argentina, Chile, Colombia, Mexico, and Uruguay.

24 The main design deficiencies are related to low coverage of sectors and types of polluting power generation, and to the tax compensation schemes (Forero, Rasteletti, and Urrea, 2022).

25 In 2022, the average carbon tax rate existing in the region was USD 27 per ton of carbon equivalent (tCO_2eq). However, if one excludes Uruguay—a country that recently introduced a carbon tax with limited coverage and a high rate of USD 120 per tCO_2eq—the average falls to just USD 4 per tCO_2eq. This figure is very much lower than the world average of countries using this instrument (USD 30 per tCO_2eq) and below the benchmark rates used by the IMF and the OECD, which are USD 75 and USD 60 per tCO_2eq, respectively (IMF, 2019b; OECD, 2021a).

26 Colombia, Ecuador, El Salvador, Guatemala, Guyana, and Nicaragua.

- Carbon pricing encounters considerable public and political resistance (Maestre-Andrés, Drews, and Bergh, 2019). The political acceptability has been identified by some as the greatest challenge when it comes to implementing carbon pricing (Klenert et al., 2018).

- There are different forms of design mechanisms for carbon pricing. The most appropriate policy option will depend on a combination of factors such as the profile of the country's GHG emissions, energy and fiscal policy objectives, the climate change risk profile, and the country's tax administration capacity.

- One of the reasons that carbon taxes have been difficult to implement is that they can lead to higher poverty levels by increasing (directly or indirectly) the price of basic goods and services, such as food, energy, and travel (Vogt-Schilb et al., 2019), if the rates applied are high. In this context, it is important that they are carefully designed in order to ensure that the tax is progressive.

- The most notable factors when it comes to implementing carbon price-fixing mechanisms include, on the one hand, political approval, consultation with stakeholders, and measures of protection for lower-income groups; likewise, it is essential to analyze and evaluate the specific situation in each country and the different instrument designs available, as well as verifying that there is an appropriate context, an integrated reform plan, the willingness to carry out gradual and sequential implementation, and the necessary guarantees to achieve positive environmental effects. Furthermore, it is important to establish effective communication strategies, focused on informing the public about the negative consequences of subsidies for public finances, as well as for the environment and distributive fairness.

- It is difficult to evaluate quite how progressive carbon taxes are in developing/emerging economies, given that in the majority of cases they have been in place for less than 10 years. It is not clear, either, what exactly is driving the adoption of carbon pricing in these developing countries. Some of the possible motives might be the willingness to comply with international protocols, the desire to build a country brand based on environmental objectives, or the decision to increase revenues.

To summarize, it would seem that no single solution exists. Pricing policies can help, but they do not have the capacity to solve everything. On the contrary: achieving the cuts in emissions needed in the time required by the Paris Agreement demands unprecedented transformations of tremendous scope to energy systems, buildings, industry, transport, food, and forestry at the global level. Beyond the discovery of some extraordinary solution, which does not exist, modern international recommendations highlight the opportunity and the need to: (i) conceive broad and integrated actions that, as a whole, impact the regulatory framework of each sector; (ii) establish standards of sustainable infrastructure in all buildings and facilities; (iii) eliminate the market barriers that hamper the growth of renewable energies despite their competitive price (for example, monopolies); and (iv) drive forward research and development in new technologies for sectors difficult to decarbonize (for example, the cement industry), among others (Fay et al., 2015; Arregui et al., 2020; Boehm et al., 2021; IPCC, 2022a, 2022b; Fazekas, Bataille, and Vogt-Schilb, 2022).

6.3. Options for Strengthening an Agenda Aimed at Eliminating Fossil Fuel Subsidies and Driving Green Taxation Policies

The design of green fiscal reforms must include rectifying the costs and eliminating the distortions caused by fossil fuel subsidies. The success of these reforms depends, to a large extent, on taking into consideration the political and social consequences of the subsidies. In any case, key sectors must be identified that constitute the most vulnerable communities (for example, transport services) in order to counteract any negative effects during the reform and the most effective form of compensation. One efficient way of addressing distributive impact is to make temporary use of part of the savings generated by rationalizing subsidies. The IDB has estimated that less than 30 percent of the saving generated by eliminating subsidies would have to be redistributed among the vulnerable groups (Vogt-Schilb et al., 2019). In the case of carbon taxes, these should be considered as an additional tool in a context that requires the elimination of other financial and non-financial barriers that hamper the introduction of clean technologies, as in the case of monopolies and tariff barriers.

With regard to the design of carbon taxes, policymakers should consider: (i) their impact on competitiveness; (ii) their contribution in raising the revenues destined to finance the countries' climate goals; (iii) their range of application, whether a national or a subnational tax; (iv) whether direct emissions will be taxed or whether the average carbon content of the fuels will be used for calculating the tax rate; (v) the definition of the place in which the tax will be paid, determining at what point in the distribution chain it is applied, or whether legal persons are responsible for paying it; (vi) the sectors, activities, and types of fuels to be covered by the tax; (vii) the distributive impacts and effects on tax efficiency; and (viii) the options for using the resources generated, such as compensating the distributive impacts of the tax or investing in resilient and low-carbon infrastructure.

Furthermore, the knowledge agenda pertaining to this subject should also be expanded, with particular focus on the following aspects:

- Calculation of the estimates (at the country level) of the emission price trajectories needed to comply with the Paris Agreement commitments and the other externalities reflected in the fuel taxes (or other price-fixing instruments), as well as estimates of the reform's impacts on energy prices, emissions and fiscal balances, vulnerable groups, and the economy in general.

- Carrying out quantitative evaluations of compensation among different alternative policy options to help policymakers communicate to the public the benefits of establishing price-fixing mechanisms.

- Assessing other components of the carbon tax implementation strategy, such as cuts in other taxes, and the measures to provide relief to households, workers, and firms especially vulnerable to higher energy prices.

- Analysis of recent reform experiences, which can help to better understand how to tackle any potential political and social challenges.

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