IMPUESTOS VERDES
OFFSETS + ETS

5

Series of Booklets - Carbon Pricing Instruments

OPTIONS FOR A MIX OF CARBON PRICING MECHANISMS IN CHILE

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Abstract

The implementation of a carbon tax in Chile (2017) constituted a first step in the use of economic mechanisms in support of climate policy. Its successful application paved the way for the mechanism that can now be used to tax the establishments responsible for the highest levels of emissions, implementing a more sophisticated system and moving towards taxes with offsets (Law 21,210), thus incorporating elements of a market system to enhance pricing mechanisms, with the goal of maximizing cost efficiency in mitigating carbon dioxide (CO2). However, there is still room to continue improving and incentivizing the transition to carbon neutrality that the country has pledged to achieve by 2050. The carbon pricing policy is expressed through a number of regulatory, administrative, and economic mechanisms, generating implicit and explicit prices. Evaluating the interaction between these mechanisms in general and potential transitions to specific carbon pricing instruments will prove vital not only for achieving the country's national goals and international commitments relating to climate change, but also for environmental oversight in general. This document explores some of these key elements, highlighting difficulties and opportunities.

Introduction

Ever more countries and jurisdictions are adopting mechanisms to set carbon pricing as part of their policy to decarbonize their economies and meet commitments stipulated in their NDCs. The World Bank (2020a) reports that 61 carbon pricing initiatives currently exist, covering approximately 22% of global greenhouse gas emissions. There are several ways of implementing a carbon pricing instrument (CPI), and the selection of one or more mechanisms, as well as their combination with other climate policies, depends on each jurisdiction, and its effective implementation, requiring: i) political will in the government promoting the instrument; ii) technical feasibility (design competencies in the public sector and implementation competencies in the private and public sectors) and political feasibility (widespread support); and iii) supporting institutional infrastructure.

In 2017, Chile implemented its first tax on local atmospheric pollutant emissions and emissions of the main global pollutant, carbon dioxide (Law 20,780, and subsequent simplification under Law 20,899). The tax applies to stationary sources and first sale of medium and light vehicles[2]. In 2020, the Tax Modernization Law (Law 21,210) modified the tax threshold for establishments with stationary sources, moving from a threshold based on technology and thermal capacity (boilers or turbines with a total capacity of 50 MWt) to an annual emissions threshold (≥ 100 tons of PM or ≥ 25,000 tons of CO_2). It also incorporated a new environmental management mechanism, offsets, as a tool to operate alongside the taxes, thus adding a market element that enhances flexibility to incentivize even more efficient reductions[3].

These innovations will come into force in 2023, as a bid both to strengthen local atmospheric decontamination and to respond to the two main GHG mitigation challenges: meeting the NDC (Government of Chile, 2020a) and attaining carbon neutrality by 2050. However, the implementation of these carbon pricing mechanisms (tax + offsets) must be evaluated as part of a broader framework: a national carbon pricing policy integrated with other related policies. Indeed, carbon pricing initiatives are not the only mechanisms that play a relevant role in GHG mitigation, as other policies can generate implicit carbon pricing with a significant impact, such as: i) the Climate Change Framework Bill, leveraging the potential usage of surplus or reduction certificates to meet the proposed GHG standard; ii) the usage of shadow carbon pricing in the social evaluation of projects by the Ministry of Social Development; and iii) nature-based solutions to achieve reforestation and native woodland recovery targets in the NDC.

Furthermore, discussion regarding new mechanisms requires broad political debate on how market-based instruments can contribute to achieving the end goals of climate policy, covering elements such as effectiveness, efficiency, and equity. This agenda must also include the need for balance between requirements for administering more complex mechanisms, and existing capacities within State bodies and regulated establishments, which are required to take on new functions and will hence need more resources. Thus, after carbon pricing instruments that incentivize a market between regulated bodies and/or non-regulated bodies have been evaluated for feasibility and effectiveness, there is a need to assess the advantages of expanding these instruments in terms of their costs and benefits, as well as their coherency and consistency with environmental policy as a whole.

1 This document constitutes an update to 'Potentialities and Possible Transition of Chile's Green Tax' (2018), prepared by Rodrigo Pizarro, Francisco Pinto, and Sebastián Ainzúa. Update prepared by Francisco Pinto.
2 Depending on the levels of emission (nitrogen oxides), urban performance, and sales value.
3 For more details, see: Leaflet 1, 'Green Tax: Starting point for the deployment of carbon pricing mechanisms in Chile'.

Carbon Pricing Instruments and Policy

Before addressing carbon pricing instruments, it is useful to define how carbon pricing policy is expressed and understood. The policy uses a range of measures to establish an explicit or implicit price/cost on carbon emissions, with the objective of generating incentives for emissions mitigation/reduction. This charge may be levied on products, activities, processes, or investment decisions. An implicit carbon emission price may stem from a policy, regulation, or other political instrument, such as stipulating a regulation on maximum emissions at a source and costs associated with non-compliance.

Meanwhile, an explicit price may be placed on carbon emissions by means of a policy, instrument, or other mechanism, such as: imposing a tax on a unit of carbon emission, establishing a social cost for evaluation of social projects, or setting a cap on emissions, with subsequent permit auctions and creation of a transfer market (as in Emissions Trading Systems).

Meanwhile, literature on CPIs tends to classify such instruments rather than defining them, referring to them as initiatives or mechanisms that explicitly put a price on carbon through tradable emission permits, taxes, offsets, or other mechanisms (WB, 2015; Tietenberg, 2013; and Narasimhan, 2018). Others (i.e., Pizarro 2020) propose a broader definition, in which a CPI is 'a policy vehicle implemented by means of legal and institutional infrastructure that places a price on carbon emissions in specific sectors and/or entities, through regulations, routines, or practices.'

The definition of an IPC is relevant in itself, and also to understand that their adoption meets the specific contexts in each jurisdiction, although three conditions must be met in all jurisdictions where they are implemented: i) political will in the government in power; ii) technical and political feasibility, in that it must be economically and politically possible to implement the mechanism; and iii) a solid institutional structure must be designed and implemented to underpin their operation, including record keeping and measurement, reporting, and verification (MRV) for specific information. However, the specific features of each context are deciding factors in the decision to implement one option or another. Why do some jurisdictions adopt a tax, while others choose an emissions trading system (ETS)? It is possible to implement a tax and an ETS simultaneously? Why tax emissions instead of carbon content? Why establish an application threshold based on a site's technological characteristics instead of its emissions? Should the rate be high or low? The answer is that the choice of instrument type and implementation strategy depends on the context. Some countries or jurisdictions adopt one instrument instead of another due to their political viability, such as the Californian ETS or the RGGI (Regional Greenhouse Gas Initiative), which were selected under circumstances in which it would be very difficult to achieve the quorum necessary to impose a tax. Similarly, why does the Chilean tax apply to emissions instead of carbon content, when the latter could allow for a more easily implemented system? The answer is that the Chilean strategy met the twofold objective of taxing emissions of both local and global pollutants simultaneously, while also avoiding any doubt as to the environmental objective behind taxing these pollutants. The variety and versatility of CPIs allow mitigation challenges to be addressed in each jurisdiction, adapting to specific contexts, and achieving reductions in a cost-efficient manner.

A number of options and combinations of options exist for pricing instruments. Thus, a tax implemented alongside an offsets market can generate reductions at lower cost than a tax alone. Furthermore, an ETS with a relatively shallow secondary market will not bring

about reductions as economically as an ETS with an extensive market. Indeed, the price of carbon in an ETS with a limited secondary market more closely resembles a tax, with prices staying close to the lower limit.

Jurisdictions have adopted different carbon pricing options, and some have moved from a pure instrument to a hybrid system with market instruments, as has occurred in Mexico, Colombia, and Chile. Mexico began with a tax on the carbon content of certain fuels, and is now in the pilot phase of an ETS. Meanwhile, Colombia and Chile started with a carbon tax, and have since transitioned to a tax with offsets, with the specific goal of incentivizing more efficient reductions. Indeed, Colombia is now moving towards implementation of an ETS mechanism, which will come into force alongside the carbon tax and offsets. The ETS is expected to enter its pilot phase in 2024.

Potential further transitions

The forerunner document to this publication[4] suggested a number of options that Chile could select to scale its carbon pricing instruments, following consolidation of the green taxes implemented in 2017. Finally, two of these options were incorporated in the Tax Modernization Law (Law 21,210), which was passed in February 2020[5]:

i. The change from a technical threshold (boilers or turbines at establishments with a total thermal power level of 50 MWt) to an annual emissions threshold (≥ 25,000 tons of CO2 or ≥ 100 tons of PM per year).

ii. The incorporation of offsets as a complementary instrument for green taxes. All pollutant emissions of carbon can be offset with certified reductions in the same pollutant.

Carbon Pricing Instruments

Taxes establish a carbon price by charging for emissions (downstream taxation) or for the carbon content of fossil fuels (upstream taxation) . Taxes oblige emissions producers to internalize emissions costs, but do not place any limit on emissions. Emphasis is therefore placed on pricing: ideally, this should reflect the social cost of polluting.

Emissions Trading Systems (ETS) determine an aggregate limit on emissions and assign limited permits to emissions sources such as to meet this cap. These permits can be traded, and supply and demand for permits can be used to establish a market price for emissions. Under these systems, a maximum limit is set for aggregate emissions such as to ensure a result for the system as a whole, regardless of which stakeholders undertake efforts to reduce their emissions. In definitive terms, emphasis is placed on the quantity of emissions, with the market that it generates setting the price.

Carbon offset systems are an emissions 'exchange' tool that allows a reduction or sequestration of GHG emissions in one sector or jurisdiction to compensate emissions that are released in other sectors or jurisdictions. This exchange is achieved by means of Certified Emission Reductions (CERs), which are traded on carbon markets.

4 Potencialidades y posibles tránsitos de los impuestos verdes en Chile.
5 Para mayor detalle Ver Folleto 1: Impuesto Verde: Punto de partida para el despliegue de Instrumentos de precio al carbono en Chile.

Despite progress in carbon pricing instruments, ample room remains for fine-tuning the mechanisms and adding to their sophistication. In the former area, two key elements must be assessed in order to move toward greater efficiency.

First of all, the tax rate (USD 5/ton CO_2) is fairly low compared to the price levels required to meet the Paris Agreement. Indeed, the 'Report of the High-Level Commission on Carbon Prices' (CPLC, 2017) stated that in order to meet the Paris Agreement, costs per ton of CO_2should vary between USD 40 and 80 in 2020, reaching USD 50-100 by 2030. Currently, less than 5% with a CPI fall within this range (World Bank, 2020). Furthermore, almost half of these jurisdictions have prices below USD 10 ton/CO_2. Chile's original strategy featured a low price for the implementation of the country's first carbon tax, in a bid to ease political and economic pressures on introduction.

Therefore, particularly in the Chilean system, a considerable divide must be bridged in order to reach a rate closer to the shadow price for carbon emissions. Indeed, in 2017 the Integrated Project Bank of the Ministry of Social Development (MDS) updated the carbon price used in social evaluation of projects from USD 5 ton/CO_2 (MDS, 2014) to almost USD 32.50 ton/CO_2 (MDS, 2017), which could be seen as a first step in scaling the tax's value in the country.

Therefore, an increase in the tax rate must be evaluated in light of its economic and social impact. The electricity sector currently accounts for 94% of green tax revenue, so the effects on this sector of an increase in the tax rate must be understood, in terms of both triggering clean energy projects, and potential impacts on electricity consumers. Given the conditions affecting the electricity market[6] and the pro-rating mechanism established such that the tax is to be paid by generation units supplying power into the grid or withdrawing power from it, including non-conventional renewable energy plants, turning to the spot market as a necessary tool for meeting power supply contracts, evaluation must be conducted to assess the applicability of transferring the tax cost to the marginal cost of power generation so as to change the dispatch order in line with the real costs accrued at the unit (including environmental costs and whether the social benefit brought by this change outweighs the costs). Certain preliminary studies indicate that in view of the electricity market's current structure, the social costs of such a measure would be greater than the benefits (Bórquez et. al., 2019), and therefore evaluation must address both how the tax is to be inserted into the electricity generation market, and its structure in general.

A further key element relates to the restrictions on offsets established under Law 21,210. While the incorporation of offsets is seen as a step forward, as noted in the applicable legislation, limits are imposed on the creation of mitigation projects. Indeed, the law establishes that offsets must be generated through reductions in the same pollutant, thus bypassing all other greenhouse gases that play a role in climate change. To bolster the supply of reductions offered, legislation could establish that all reductions or sequestration of GHGs other than carbon dioxide (CO_2) can be adjusted with the radiative forcing CO_2 equivalence factor reported by the Intergovernmental Panel on Climate Change (IPCC).

Potential new approaches

In view of the nature of carbon dioxide as a pollutant (particularly the technological difficulty of emission abatement), it is vital for climate policy to have access to mechanisms to trigger

6 The national electricity market establishes marginal costs as the basis for determining dispatch orders for power plants.

mitigation (or to promote sequestration). Well-designed economic instruments ensure that this objective is achieved cost-efficiently. However, it is also necessary to evaluate how they interact with other instruments and whether the tool is consistent and coherent with climate policy in general.

Upstream Taxation

The carbon tax was established as a downstream tax[7] because it applies to pollutant emissions, thus making it coherent with abatement of local and global atmospheric pollution; however, application is only feasible for a limited number of sources. The tax cannot be expanded to cover all emissions due to technical capacity at establishments, technology, and costs. One alternative would therefore be to expand the tax to the entire economy by placing a generalized upstream tax on fuels, with the rate based on carbon content. This form of taxation establishes the point of regulation, monitoring, and collection at the first bodies that market fuels, such as natural gas processing facilities or oil refineries. The tax can thus be extended to the entire economy, with reduced regulation and transaction costs, as monitoring is not required at all emissions sources. It also resolves problems linked to leakage and sector competitiveness. However, it is important for the design process to ensure that the mechanism does effectively create incentives for change in behavior by stakeholders (PMR, 2017).

Emissions Trading Systems (ETS)[8]

Like taxes, well-designed and well-implemented ETS initiatives can offer cost efficient reductions in pollutant emissions, as they incentivize participants to reduce their emissions in a more flexible way, wherever costs are lowest and in line with their technological and production structures. Trade in emissions permits generates a market price for pollutant emissions based on supply and demand. Therefore, the broader and deeper the secondary market in emissions permits is, the more options exist to reduce mitigation costs. Furthermore, from an economic perspective, these systems are more readily integrated with international jurisdictions, potentially allowing emissions to be reduced at lower costs by increasing the size of the market.

However, it must be noted that the implementation of such mechanisms faces a number of challenges, particularly in low and middle-income countries. Indeed, designing and implementing an ETS requires the formation of new institutional structures, demanding new regulations, new capacities in the public and private sectors, and often a specialized regulatory body. In this regard, Chile stands out for several technical advances that could pave the way for a transition to an ETS, as the tax is levied on emissions (downstream taxation), and the new applicability threshold is similar to the system implemented in jurisdictions that possess an ETS, as well as a strong MRV system.

The launch of an MRV system brings with it a number of complexities, and is of particular relevance in terms of institutional structures. Institutions require not only a registry of establishments and an emissions MRV system, as used in a taxation-based system; they also require a system for recording financial transactions with banking-grade data security (level 5) and a mechanism to ensure that any emissions permit can only be used once.

7 For details on the issue of downstream regulation, see Leaflet 2. Institutional Structure associated with Carbon Pricing Instruments.
8 For more information, see 'Emissions Trading in Practice: A Handbook on Design and Implementation' (PMR and ICAP, 2016).

Price variability is another aspect relating to the implementation of an ETS. The ETS sets the number of emission units permissible in a jurisdiction, and allows the price to float on the market depending on demand in affected sectors. In the past, this has led to highly variable pricing (Friedrich et al., 2020 and Zhang et al., 2019), imposing uncertainty on the private sector. However, experiences in a wide range of countries, and particularly in jurisdictions such as the European Union and Quebec, have bolstered the development of strategies and tools that can complement and stabilize the market price to control this risk, most notably using pricing bands and reserve funds.

Additionally, Chile could benefit from an ETS designed to be linked with other countries or jurisdictions, thus helping to offer more attractive prices (lower costs). This is particularly applicable given than most of the current carbon emission tax is paid by a small group of companies. Just ten establishments (all of them in the electricity generation sector) account for 68% of the total.

Therefore, as the market is small, with production sectors operating major emissions sources, with high concentration and low competition, an internationally connected ETS would probably be more effective. Such a system would allow more competition and heterogeneity in the technological and production structure of affected sources, facilitating emissions trading. However, little experience currently exists in links across multiple jurisdictions, and specifically between jurisdictions at different levels of economic development (Flachsland et al., 2009; Doda et al., 2017).

Experience in this field can be drawn from the European ETS and its connection with Switzerland, the RGGI system that covers several states in the in the Northeastern USA, and perhaps of greatest relevance for Chile, the 'Western Climate Initiative', which comprises an ETS that connects the sub-national jurisdictions of California and Quebec, with a possibility that Mexico may join the system in the medium term[9]. Finally, it should be noted that Chile forms part of the Pacific Alliance, a regional commercial integration bloc that also includes Colombia, Mexico, and Peru. The Alliance has a specific commitment under the Paris Agreement, and has also made the decision to intensify its MRV efforts with a view to identifying possible voluntary market mechanisms in the Region (Cali Declaration, 2017[10]), giving rise to options to explore possible integration models for carbon markets, albeit in the medium and long term.

Linking or connecting ETS initiatives across different jurisdictions presents economic advantages, but also significant challenges. The principal advantage is that an integrated ETS establishes a single price per ton of CO2 emitted or reduced across all participating jurisdictions. This means that if the permit cap is established correctly, CO2 reductions will come at the lowest possible cost, because the minimum marginal cost for reduction is accessed across the entire integrated market. It should be noted that the environmental objective would thus be achieved at the lowest possible cost in the integrated jurisdictions. The emergence of a single price across heterogeneous economies will generate impacts on competitiveness that should be addressed. However, in order to prepare applicable sectors, the State can implement prior support actions of different types (such as training activities

9 Details on the potential effects associated with international links can be found in 'Considering the Effects of Linking Emissions Trading Schemes. A Manual on Bilateral Linking of ETS' (Beuermann et al, 2017) or 'Linking Emissions Trading Schemes' (Tuerk, A. et al, 2009).
10 Available at: https://alianzapacifico.net/download/declaracion-de-cali-junio-30-de-2017/

and promotion of R&D) so that the required technological changes are gradual and economic impacts are minimized.

It is important to point out that one of the main technical challenges imposed by an ETS that integrates different jurisdictions is 'homologating' or 'harmonizing' the MRV systems, with verification comprising the most complex subsystem, as it must be sufficiently reliable, transparent, and traceable for all parties. The integration of carbon markets therefore entails significant methodological, technical, legal, and IT challenges.

Another major element in implementing an ETS centers on how emissions permits are initially assigned to industries. One strategy is to offer free permits based on historic emissions at individual entities — known as grandfathering — or at a specific reference point for the entire industry — benchmarking — and depending on whether the assignation changes when production changes (ICAP and PMR, 2016[11]). This enhances acceptability amongst regulated parties, as in principle the more efficient bodies have the possibility of obtaining an economic benefit (Victor and Cullenward, 2007). However, the possibility of generating and transferring revenue to exactly the parties that are 'polluting' can add further difficulty associated with the loss of efficiency and equity (Rode, 2014), albeit moreover as an area ripe for political conflict.

Another way to assign permits is using an auction system. This may generate new revenue for the State, which can compensate society for the increase in prices of some goods/services produced and affected by the regulation (such as electricity) or distribute the revenue to the citizenry at large through a wide range of social programs in general, and environmental programs in particular (Burtraw et al., 2005), while also avoiding potential political conflicts arising from free assignation of revenue (Cramton and Kerr, 1998)[12].

Permits can also be assigned using a hybrid mechanism. Some are auctioned, while others are freely assigned. However, free assignation of permits requires economic justification and political agreement, with transparency regarding the criteria in use: for example, effects in competitiveness and/or leakage of emissions to unregulated jurisdictions

Hybrid Systems

Carbon pricing instruments can coexist. Indeed, such a strategy can reduce some of the difficulties inherent in implementing 'pure' systems, such as issues in equity and allocation of responsibilities for an ETS. These models are known as hybrid systems, as they allow taxes to be combined with emissions market systems.

Hybrid systems can be based on a charge levied on emissions, with transfer and trading in emission permits. These instruments allow the creation of a mechanism whereby resources can be transferred with multiple objectives. Indeed, hybrid systems not only help reduce price volatility and limit potential for policy errors caused by uncertainty; they can also help avoid problems linked to interactions with other climate policies (Goulder and Schein, 2013). Adding the option to use offsets can provide regulated parties with more flexible options for meeting their commitments, and incentivize mitigation in sectors that the mechanism does not directly cover, while generating a number of knock-on benefits at a local level.

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11 For more information on assignation methods, see "Emissions trading in practice: A handbook on design and implementation" by the International Carbon Action Partnership (ICAP) and Partnership for Market Readiness (PMR). Available online at: https://icapcarbonaction.com/en/?option=com_attach&task=download&id=364

12 The Chilean Constitution establishes the principle of 'equipoise', whereby no tax may be raised for a specific purpose.

Interaction with other carbon pricing policy instruments

Chile has a commitment to meet the Paris Agreement (specified under its NDC) and the United Nations Sustainable Development Goals (SDGs), which include 'Take urgent action to combat climate change and its impacts' (Goal 13). Under the updated NDC submitted in 2020, Chile commits to a GHG emission budget not exceeding 1,100 MtCO2eq between 2020 and 2030, achieving a GHG emission level of 95 MtCO2eq by 2030. This goal also forms part of a broader objective: achieving carbon neutrality by 2050, as stated in both the NDC and the Climate Change Framework Bill, which is under discussion in the country's Congress at the time of going to press.

Of course, carbon pricing policy and mechanisms will play a decisive role in achieving this goal. It is therefore relevant to identify, evaluate, and discuss all public policies (and interactions between them) that could explicitly or implicitly affect the price of carbon. At this time, it is also important to consider the 'Long-Term Climate Strategy' that the Ministry of the Environment is coordinating. Relevant policies for consideration include:

Specific tax on fuels

Fossil fuel usage accounts for the bulk of GHG emissions, so mechanisms that incentivize the internalization of their social and environmental cost (negative externalities) can enhance efficiency, although implementation can be politically complex. Chile already possesses a specific tax, instated in 1986 (Law 18,502) to help fund reconstruction in the wake of the 1985 earthquake; it applies to a number of fuels, including the gasoline and diesel used by automobiles. However, the tax on diesel (1.5 UTM) is 75% lower than on gasoline (6 UTM), which incentivizes usage of diesel, in a mechanism with no environmental justification[13].

Efforts were made to ameliorate this situation with the green tax on medium and light vehicles instituted in the 2014 Tax Reform (Law 20,780) which applies to first sale, based on urban fuel economy (km/liter), potential NOX emissions, and vehicle value. To date, few studies have assessed the impact of this tax, although one publication (Mardones, 2018) indicates that it has not achieved a significant impact on the number and types of vehicles in use. More analysis is therefore required regarding the tax's impact and the conditions that would make it more successful.

Climate Change Framework Bill

The Climate Change Framework Bill was put before the Chilean Congress for debate on January 13, 2020 (Government of Chile, 2020b); Articles 13 and 14 of the proposed law cover emissions standards and certificates for GHG emissions reductions, sequestration, or surplus, which can be used for compliance with the regulations. It also proposes that the Ministry of the Environment may authorize the use of certificates of emissions reduction or absorption linked to projects implemented in other countries, within the framework for cooperation specified in Article 6 of the Paris Agreement, and links to this international instrument or other similar agreements. The regulations will specify the necessary conditions and requirements, in line with the Paris Agreement Rulebook.

If passed into law, the bill will generate a new price and potential market for carbon. Indeed, from an economic perspective, regulated parties will be incentivized to adhere to the standard when the costs associated with non-compliance exceed compliance costs. This

13 Tax exemptions also exist. Two relevant examples: i) 100% exemption for diesel used in activities unrelated to road and highway transport; and ii) up to 25% exemption for freight transport (depending on company size).

will generate an implicit carbon price, with revenue accruing to the State when regulated parties not subject to green taxes breach the law (and must therefore pay a fine). Meanwhile, the initiative will create a new market option by permitting the use of emissions reduction certificates. In line with these measures, the certificate mechanism must be coherent with the offset system that is currently being designed by the Ministry of the Environment, in order to achieve compliance with the Tax Modernization Law. The innovative element is that the new Bill proposes that applicable offsets may be linked to reductions achieved in other countries, although this is one of the aspects under debate in Congress. Such a system would be more beneficial to regulated parties, providing them with lower compliance costs if applicable offsets exist in another jurisdiction, so long as the regulatory conditions are met. However, this would also limit the incentive to implement domestic emissions reduction projects, resulting in the loss of all potential co-benefits favoring society as a whole.

Article 6 of the Paris Agreement: Options

This discussion centers on Articles 6.2 and 6.4 of the Paris Agreement. Article 6.2 paves the way for internationally transferred mitigation outcomes (ITMOs) between Parties[14], creating a potential international carbon market that will become operational once its rulebook has been approved. Such a system will create broad possibilities for more efficient GHG mitigation, by connecting jurisdictions with high and low mitigation costs. Meanwhile, Article 6.4 covers a centralized mechanism for transitioning the Clean Development Mechanism (CDM). The new mechanism will allow national reduction commitments to be partially offset through mitigation projects that also meet the principle of additionality: their implementation must be shown to have a real impact on reducing emissions or increasing sequestration of GHGs. The parties have yet to define operational mechanisms for existing CDM projects that may remain active when the new centralized system is implemented.

In addition to CDM projects, other voluntary market reduction programs are under development in Chile, and may coexist at the time when any centralized mechanism is implemented. These include Verified Carbon Standard (VCS) and Gold Standard (GS). The CDM, VCS, and GS projects are estimated to account for 16 million carbon credits, with 34 million more set to be added in new projects that may be implemented in the next five years (StratCarbon, 2020). Discussion will address how these projects can coexist under Article 6.4 and whether a gradual integration process will be applied, with corresponding adjustments.

Meanwhile, a number of international initiatives are seeking to explore and/or implement collaborative mitigation mechanisms between countries and jurisdictions. The World Bank is spearheading the Carbon Market Club, whereby a group of national governments are jointly undertaking pilot activities relating to Article 6.2 of the Paris Agreement. It is formed on the basis of mutual understanding and commitment from all Members to make efforts to adhere to and implement the principles of ensuring environmental integrity, avoiding double counting, and following the rules and guidance that emerge from international negotiations. Chile, together with ten other countries, has confirmed its participation in this Club (World Bank, 2020b).

Hay iniciativas bilaterales como el Joint Crediting Mechanism (JCM) liderado por Japón, el cual Bilateral initiatives also exist, such as the Joint Crediting Mechanism (JCM) led by Japan,

14 Parties shall, where engaging on a voluntary basis in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards nationally determined contributions, promote sustainable development and ensure environmental integrity and transparency, including in governance, and shall apply robust accounting to ensure, inter alia, the avoidance of double counting, consistent with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to this Agreement.

which facilitates the dissemination of low-carbon-emission technologies, products, systems, services, and infrastructure, together with the implementation of mitigation actions and contribution to sustainable development. The mechanism evaluates contributions to reducing or removing GHG emissions and uses them to achieve the objective of reducing Japan's emissions, under a prior agreement with the country in which the agreement is applied. Chile currently features a reduction project with average annual performance of 500 tons/CO2eq .

Another alternative is represented by the Climate Teams initiative: a cooperative mechanism that operates under the Paris Agreement whereby 'host' countries can reduce their net greenhouse gas emissions more quickly using resources provided by 'partner' countries, which can in turn increase their reduction ambitions. The mechanism connects these countries so that they can work together and reduce global emissions more cost-efficiently. Here, Chile offers advantages by providing a solid institutional structure and a robust MRV system for GHG emissions, both for the country's national inventory (top-down approach) and for establishments/emissions sources subject to green taxes (bottom-up approach).

In general terms, the mechanism operates under an agreement between a small group of governments that make arrangements to provide counterparties with payment for emissions reductions above and beyond the commitments made by the host country. This is a novel mechanism that has yet to be put into practice. Chile could become the first host country to explore it, and potentially to implement it. This could provide access to a vast quantity of resources and significantly advance progress towards meeting the carbon neutrality commitment (Kerr and Pinto, 2020), for example: i) accelerating the process of retiring coal-fired thermoelectric plants, scheduled for 2040; ii) allowing early implementation of hydrogen in Chile; or iii) accelerating electric urban transport (in commercial and private vehicles) by means of incentives.

Other bilateral initiatives exist between countries that seek to build cooperation for implementing projects under Article 6.2, such as Switzerland (which has already signed agreements with Peru and Ghana) and Sweden.

15 More details at: https://www.jcm.go.jp/cl-jp/projects/61

Conclusions

The implementation of Chile's first green taxes (2017), including a carbon tax, allowed the installation of a fully-formed institutional infrastructure that underpins the mechanisms, including a complete MRV system. The consolidation of this instrument, together with the need to adjust it and align it to meet local environmental challenges and international commitments, led to adaptation of the tax and the incorporation of a new tool (emissions offsets) under the 2020 Tax Modernization Law, enhancing the flexibility of the carbon tax to allow reductions to be achieved more efficiently.

Although this represents an advance in carbon pricing policy, key elements of the program's design remain to be considered in the future in order to make these instruments into a more efficient tool for GHG mitigation and capture: increasing the tax rate, and expanding the usage of offsets to cover all GHGs (not only carbon dioxide).

Furthermore, both the national contingency and the international emergency linked to climate change offer opportunities to carry on expanding and adjusting carbon pricing mechanisms. Chile has a commitment to decarbonize its economy by 2050, and therefore its updated NDC, the Climate Change Framework Bill currently under debate in its legislature, and its Long-Term Climate Strategy are built around this objective, in an effort to expand mitigation options through tools that are coherent and compatible with environmental policy in general, and climate policy in particular.

Meanwhile, Article 6 of the Paris Agreement represents an opportunity to accelerate Chile's decarbonization process through international cooperation under bilateral and multilateral agreements. The country is well-positioned to form mutually beneficial arrangements for all parties: a solid environmental institutional structure, a robust MRV system, experience in implementing carbon pricing mechanisms, and installed technical capacities.

The opportunity to accelerate and progress towards a sustainable, low-carbon economy is at hand; the challenge lies in designing and implementing mutually complementary policies consistent with national policy objectives. This requires broad dialog between stakeholders, resources for implementation, and the formation of a review process that assesses the impact of policy instruments implemented.

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