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POSSIBILITIES AND POSSIBLE TRANSITIONS OF

CHILE’S GREEN TAX
Potentialities and possible transitions of Chile’s Green Taxes

ABSTRACT

The green tax implemented in Chile was designed as a strategy to address local and global environmental problems. However, once in effect, the Government hopes to discuss the expansion of the tax or a move towards more sophisticated carbon pricing instruments such as an offset system or tradable emissions permits. Today, the carbon pricing system is in the process of consolidation, and its primary challenge is to institutionalize the instrument as a public policy tool. The possible expansion of carbon prices will require an in-depth debate on the objectives of environmental policy and an examination of the options to escalate the tax and the challenges implied by each.

INTRODUCTION

In 2017, Chile implemented, for the first time, a tax on local and global contaminating emissions (Law 20,780). The tax was designed according to the Government’s concerns regarding local and global air pollution. At the same time, the effective implementation of this tax has involved the development of new regulations. Ultimately, the introduction of a green tax in Chilean environmental policy has allowed for the construction of an institutional infrastructure that may help expand the scope of the tax in the future or move towards more sophisticated carbon pricing instruments, including offsets and/or tradable emissions permits. For this to occur, once the tax has gone into effect, it must be consolidated as a tool bearing political legitimacy and regulatory functionality.

The discussion on the use of these mechanisms requires a broad political debate on how market instruments can contribute to achieve the final goals in environmental policy, considering elements such as effectiveness, efficiency and equity. The debate must also consider a necessary balance between the requirements for the administration of more complex instruments and the current capacities of Government Agencies, which must assume new responsibilities and will require greater resources. That is, after evaluating the viability and effectiveness of market instruments, policymakers should consider the advantages of expanding these instruments with respect to their costs. Therefore, ultimately, the use and expansion of market instruments will depend on if they effectively help meet the public policy objective: reduce pollution at a lower social cost.

2. For more details on strategy, see: Booklet No. 1. Green Tax Strategy.
3. For more details on the regulations, see: Booklet No. 2. Institutional infrastructure of Green Taxes.
The green tax experience has made evident that the process of perfecting the regulatory and administrative system implies challenges for both regulators and the regulated parties. There are gaps that remain to be bridged to fully implement the tax. Therefore, the current challenge is to reduce the gaps in the regulatory system and evaluate its implementation in order to move towards a more complex institutional system that allows for the use of multi-purpose instruments. Along with the above, it is necessary to evaluate and study the possible alternatives for establishing the foundations of a more comprehensive system in the future.

**Escalation: The target of public policy**

The introduction of market instruments in the design of environmental policy emerges as a response to minimize environmental degradation at a lower social cost. For this, it is essential to identify the objectives to be met and then design instruments in accordance with these challenges. In the case of Chile, the possibility of escalating green taxes must be evaluated within the framework of environmental policy aimed primarily at reducing air pollution, which has been recognized as the country’s main problem, as well as to mitigate greenhouse gas emissions (GGE). This should be done by considering: (i) complying with objectives at the lowest possible cost; (ii) generate conditions to enable technological change; and; (iii) adequately accounting emissions reductions.

At the same time, the design of market instruments must be coherent with other existing public policy instruments such as: Decontamination Plans –in the case of local air pollution; The Climate Action Plan –in the case of climate policy, and; The 2050 Energy Strategy –in the case of energy policy. The new environmental policy instruments must be included in a broad political debate, consistent with international commitments and aligned with local environmental challenges.

Moreover, the instruments must be evaluated in terms of fairness and cost distribution. The State must ensure that whoever pays the costs of decontamination is the one who is actually responsible for polluting. Furthermore, the impacts must be evaluated in terms of competitiveness, as well as the exemption, and flexibility mechanisms applicable to specific sectors.

In sum, before escalating the green tax, it is key to address aspects of coherence, pertinence and fairness in relation to other public policy objectives, and not lose sight of the ultimate goal of environmental policy to reduce environmental degradation.
CARBON PRICING INSTRUMENT OPTIONS

There are different alternatives for carbon pricing instruments, all of which are ultimately based on a (direct or indirect) price discovery mechanism which helps transfer responsibility for damage to those who effectively generate it. The price signals allow agents to decide how to respond to damage, by either reducing emissions, offsetting them, or paying the price for those emissions. Carbon pricing systems assume, due to their flexibility, that environmental policy objectives will be achieved in a cost-effective manner. The two main carbon pricing alternatives are taxes and an Emissions Trading System (ETS).

Taxes establish a carbon price by charging emissions (taxes on downstream emissions) or in relation to fossil fuels carbon content (taxes on upstream emissions). The taxes require emitters to internalize the cost of their emissions, but do not establish emissions limits. Consequently, the emphasis is on the price: the social cost for contaminating.

Emissions Trading Systems determine maximum total emissions and assign limited permits to emissions sources to meet the established cap. The permits assigned may be traded in order to establish, through the supply and demand for permits, a market price for emissions. These systems define (fix) the maximum total emissions in order to guarantee an overall result for the entire system, regardless of who is making an effort to reduce emissions. Ultimately, the emphasis is on the quantity of emissions, and the price is determined by the emissions market.

Additionally, offsets can be implemented as a complementary mechanism, as well as hybrid systems, that combine taxes and ETS. From a theoretical perspective, price or quantity limits (taxes vs. ETS) are equally efficient, since both systems help reduce pollution at the lowest cost possible (Weitzman, 1974). However, implementing one or the other implies different challenges, particularly in relation to their institutional framework. The different carbon pricing instruments are compatible and complementary. Therefore, the selection of the instrument will depend on national and economic circumstances, and on the political process necessary to deal with the institutional and technical challenges of each system.
POSSIBLE TRANSITIONS: OPTIONS AND CHALLENGES

Expanding the green tax or moving towards other instruments may be options to complement environmental policy (see Figure 1). Each option generates multiple possibilities and challenges that must be analyzed before their implementation. The following provides a review of some of the options and key aspects to consider.

FIGURE 1. DIFFERENT COMBINABLE CARBON PRICING INSTRUMENTS.

Taxes on CGE emissions
Offsets emissions offsetting systems
ETS emissions trading systems

Source: Precio al Carbono Chile, 2017.

Upstream taxes

The green tax has been established as a downstream tax, because it is applied to contaminating emissions, which is more coherent with combating local air pollution. However, this can only be applied to a limited number of sources. Expanding the tax to address all emissions is not possible due to the technical capacity of the facilities, technology restrictions and costs. Consequently, one alternative is to expand the tax to the entire economy by implementing a global upstream tax on fuels, whose rate depends on carbon content. A tax in this system establishes the regulation, monitoring and tax collections in the first entities that sell the fuels, such as natural gas processing facilities or oil refineries. This helps extend the tax to the entire economy and reduces regulations and transaction costs, as it does not require that each source be monitored. It also resolves issues of leakage and sectorial competition. Nevertheless, it is important to consider a design which includes mechanisms that effectively generate incentives for the agents to change their behavior (PMR, 2017).

5. For details on the downstream regulation point, see Booklet N°2, Institutional infrastructure of Green Taxes in Chile.
Expansion of the current green tax

Another feasible option for expanding the current tax is to expand the universe of facilities or pollutants subject to taxation. The current tax establishes a charge on air emissions of PM, NOx, SO2 and CO2 produced by facilities whose fixed sources, composed of boilers or turbines, individually or as a whole, add up to a thermal power greater or equal to 50 MWt (thermal megawatts) of nominal thermal power, considering the upper limit of fuel energy. This definition only applies to 94 facilities. Based on this definition, the options may be to expand to other technologies, emissions sources and other greenhouse gases.

Expanding the number of facilities. One mechanism for expanding the sources subject to taxation could come from the reduction of the nominal thermal power thresholds or by redefining the facilities subject to taxation under total emissions criteria. This would be applied by reducing the minimum power subject to taxation to 20 or 30 MWt or by defining a limit to annual emissions per facility with respect to the taxable contaminants. For example, in the case of carbon, a tax on CO2 could be established to those entities that emit over 25 thousand tons.

This option would maintain the current structure, but would imply an increase in the sources under State regulation, an expansion of the MRV platform (monitoring, reporting and verification) and, at the same time, would imply new administrative costs for those additional facilities that, at present, only have the obligation of being listed in the Pollutant Release and Transfer Registry, PRTR (RETC, in Spanish), but are not regulated under the provisions established by D.S. No. 13/2011 of the Ministry of the Environment (MMA) or D.S No. 138/2005 of the Ministry of Health (MINSAL, in Spanish).

Lowering the threshold could imply incorporating new economic sectors and potentially require an expansion of the measurement methods. From the regulator’s perspective, the administrative costs are associated with the expansion of the registry, measurement, reporting platform, and the implementation of further oversight. However, expansion, as opposed to upstream taxes, would not affect all emissions sources.

Expansion of types of technologies. In this case, the alternative consists of incorporating technologies not covered by the tax, such as foundries or cement plants.

This option has advantages in that it maintains the downstream tax structure with quantifications in the emissions sources. At the same time, it is consistent with the country’s tax

6. Based on the Consulting Presentation “Design alternatives and complementary measures for a more comprehensive system of carbon pricing instruments”. In execution. By: OIRrec, Climate Focus, Ernst Basler+Partner. Study prepared with the financing of the Partnership for Market Readiness (PMR) of WorldBank Group.
7. The environmental regulations establish the obligation to register all boilers and turbines with a power greater or equal to 5 MW.
8. Op Cit. Consulting “Design alternatives and complementary measures for a more comprehensive system of carbon pricing instruments”.
structure, which does not allow taxation on specific sectors, only on technologies. The challenge of implementing this proposal is the need to generate a platform for the MRV system that adapts to the features of those technologies. Additionally, the promotion of this alternative not only implies a political dialogue with the new affected sectors, but it also requires the expansion of measurement methods and greater management and oversight costs for the regulators.

**Adding new pollutants.** The tax currently applies to emissions of PM, NO\textsubscript{x}, SO\textsubscript{2} and CO\textsubscript{2}. However, the system could be expanded to cover other GGEs such as, methane (CH\textsubscript{4}) and nitrous oxide (N\textsubscript{2}O). This would help reach new emitting sectors, but presents the challenge of establishing a specific MRV for the agricultural sector. These cases would require the expansion of measurement methodologies, registry and reporting platforms, as well as information verification mechanisms.

**Increase in the tax rate.** The green tax has two components: the tax on local pollutants (MP, NO\textsubscript{x}, SO\textsubscript{2}), determined based on the quantity of emissions, the level of pollutant concentration in the area where they are generated (that is, if the area has been declared latent or saturated), and the affected population; and a fixed tax of US$5 per ton of CO\textsubscript{2}. Within this framework, the tax on local pollutants addresses the damage generated and, therefore, adapts to the conditions of the affected areas. On the other hand, the tax on CO\textsubscript{2} is considerably low. At present, the new method for determining the cost of CO2 has defined a price of approximately USD 32 (around CLP 21,687\textsuperscript{9}) (Ministry of Social Development, 2017).\textsuperscript{10} This value is consistent with the goals established in the Paris Agreement considering CO\textsubscript{2} value ranges of USD 40 – 80 for 2020 and USD 50 – 100 for 2030 (World Bank, 2017).

Additionally, a study performed for the thermal generation sector shows that the tax, at its current levels, has no effect on the energy distribution or investments in the sector (KAS Ingenieria, 2016), and changes would only be seen starting at USD 14 per ton of CO\textsubscript{2}. Other research has identified carbon prices, for the entire economy, of around USD 20 (MAPS) or 32.5 (POCH Ambiental), although no specific simulations were performed for the tax\textsuperscript{11}.

In fact, the tax on CO2 was set at a low rate per ton with the purpose of implementing the institutional framework, putting into place the MRV system and increasing its political acceptability. After its complete implementation, an increase in this rate should be evaluated to adjust it upwards closer to the social cost of the damage caused by emissions. However, this would still require political consensus and the consolidation of the institutional framework.

\textsuperscript{9} Estimate based on the observed USD–CLP exchange rate as of January 2, 2017 (CLP 667.29).

\textsuperscript{10} For more details on the tax value, see Booklet No. 1. Green Tax Strategy in Chile.

\textsuperscript{11} Ibid.
General aspects related to the taxes

Beyond the expansion of the system, it should be considered that, regarding the instrument’s application, it is designed to prevent the volatility of emissions prices (Goulder and Schein, 2013), generating certainty for the private sector in terms of the price to pay, creating transparency and facilitating the development of investments. However, from a regulatory perspective, no limits to emissions are established, which would depend on decisions by the sectors, on how much of the tax is transferred to consumers and other impacts.

From the perspective of public policy, it should be noted that the Pigouvian-type tax systems (taxes on negative externalities) require a periodic revision of their rate to determine whether the damage functions are consistent with the optimal social emissions level. Chilean legislation must aim to incorporate mechanisms of dynamic consistency that are not currently considered. This will be particularly relevant if in the future other systems are adopted in which the tax is just one of the components of an integrated mechanism containing other tools, such as the hybrid systems discussed below.

Additionally, it is important to monitor the level of tax transferred to the final consumers, especially in relation to the impact this may have on the most vulnerable sectors in terms of competitiveness. For this reason, complementary public policies should be incorporated to promote technological changes in the affected sectors, as well as the exemption of certain activities or subsidies focused on the final consumers.

Offsetting

Carbon offsetting systems are emissions “exchange" tools that allow a GGE reduction or absorption measure in one jurisdiction to offset the emissions not reduced in another jurisdiction or sector. This exchange is done using carbon bonds for Certified Emissions Reductions (CERs), which can be traded in the carbon market.

An effective offsetting system requires certain baselines to demonstrate greater reductions, as well as estimates before and after project implementation. It also requires a solid and comprehensive MRV system.

Chile has had an active role in Clean Development Mechanisms (CDMs) that encourage offsetting from developed countries towards developing countries. However, in recent years, the prices of CERs have gone down considerably, which has reduced interest in this type of system. It should be noted that Chile also participates in other offsetting mechanisms such as Verified Carbon Standard (VCS) and Joint Crediting Mechanism (JCM).

With the implementation of the green tax and thanks to the development of its MRV, Chile will have an emissions registry system that can be accurately verified. Thus, even when the prices are not attractive for companies or sectors at the international level, the implementation of the tax could generate sectorial mechanisms to offset local emissions among different production sectors: ERNC projects, energy efficiency plans or reforestation strategies could allow for a national reduction of emissions through inter-sectoral offsetting.

A tax system with offsets helps reduce mitigation costs, as it encourages mitigation in some
sectors that can do so at a lower cost and trade those reductions with sectors that have higher costs. This option could consider a higher tax than is currently in effect—closer to its social cost—along with an offsetting system to facilitate tax compliance. This would require expansion of the MRV system to other sectors not covered at present, and not only an emissions registry but also a reductions registry. At the same time, it is important to consider aspects of equity in the distribution of pollutants, so that no further impact is made on areas where effective emissions reductions could be made for offsetting.

The offsetting systems have methodological challenges related to the complexity of demonstrating additional and effective verification of reductions. This implies developing contractual business as usual (BAU) models to be compared with the compensated emissions.

It is important to remember that offsets are used so that the affected facility may reduce its tax load, therefore introducing these complementary systems not only implies lower tax collection, but it also changes the logic of non-taxation. Consequently, its implementation calls for a legal strategy which would most likely require a specific law.

Finally, when discussing offsetting, it is important to highlight what has been called ‘carbon insetting,’ defined as an investment in an emissions reduction activity within a company’s scope of influence or interest, by which GGE reductions are created by association and generate a mutual benefit. An additional benefit of this approach is that it may reduce emissions throughout the value chain and create a long-term competitive advantage. Potential carbon insetting may occur in initiatives with customers, encouraging trips with low carbon emissions or reusing plastic bags, or in investments or the value chain, generating efficiency projects through joint investment (Tipper et al., 2009).

### Emissions Trading System (ETS)

Emissions Trading Systems (ETS) establish an overall limit to emissions and distribute emissions permits among emitting agents. This is the biggest advantage from an environmental perspective, as it provides certainty on total emissions reductions based on predetermined emissions limits. From an economic standpoint, they are more feasible to integrate or link with international jurisdictions, thus potentially helping reduce emissions at a lower cost.

As in the case of taxes, well-designed and implemented ETS may be cost-efficient in reducing contaminating emissions as they provide incentives to participants to reduce their emissions in a flexible manner, according to their own production structures, technologies and costs. The trading of these permits generates an implicit market price for contaminating emissions based on supply and demand.

12. The funds generated by green taxes cannot be used for specific purposes such as offsetting pollution in healthcare or subsidies for technology upgrades, because the Political Constitution of Chile prevents this. That is, all revenue goes into a national fund, which is then distributed among the country’s different needs.

13. For more information, see ‘Emissions Trading in Practice: A Handbook on Design and Implementation’ (PMR and ICAP, 2016).
However, they face several challenges with respect to their implementation, particularly in middle to lower-middle income countries. In fact, as opposed to green taxes, which, although complex, constitute a natural evolution in the tax system, tradable emissions permits imply the construction of a new institutional framework that requires new regulations, a potentially new specialized oversight entity and new public and private capacities.

 Particularly relevant in terms of the institutional framework are the design, implementation and administration of the MRV system of an ETS, which can be quite complex. In fact, not only does it require a registry of facilities and an emissions MRV system as in the tax system, but it also requires a system to record financial trading with a banking security level (5) and the registry (use) of permits to avoid double accounting.

 Another aspect related to the implementation of ETS is price variability. This system sets the quantity of possible emissions units in a jurisdiction and allows the price to fluctuate according to the demand of the different affected sectors. In the past, this has brought about a high price variability, and has generated uncertainty for private companies. However, based on the experience of different countries, especially in the European Union, strategies and tools have been developed to complement and stabilize market prices to control for this risk; specifically price ranges and reserve funds to stabilize prices.

 One important aspect of the implementation of ETS is the original assignment of permits to the industries. One way to do this is free of charge, with methods varying according to whether they are based on past emissions of individual entities—known as grandfathering—or on a specific point of reference for the entire industry—benchmarking—and depending on if the assignment changes when production changes (ICAP and PMR, 2016). This option is usually widely accepted by the regulated agents since the theoretically more efficient entities have the possibility of obtaining economic benefits (Victor and Cullenward, 2007). However, the possibility of generating and transferring income to those who are precisely doing the 'contaminating' may create an additional problem related to the loss of efficiency and equity (Rode, 2014), but primarily because it generates conflict from a political standpoint.

 Another way to assign permits is through auctions. This may generate new revenue for the State, who may distribute them to the entire community through different social and environmental programs (Burtraw et al., 2005), thus also avoiding potential political conflicts due to the assignment of income (Cramton and Kerr, 1998). The permits may also be distributed using a mix of strategies, with one part auctioned off and the other assigned free of charge. However, the portion assigned free of charge requires economic and political discussion for its implementation, with clear application criteria: for example, effects on competition and/or leakage.

 In the case of Chile, due to the small size of the market and production sectors with large facilities, high concentration and low competition, ETS would probably be more effective if

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linked internationally. This would allow greater competition and heterogeneity in the production structure and technology of the potentially affected sources, which would facilitate emissions trading. However, there is still limited experience with linking among multiple jurisdictions, and specifically between jurisdictions with different levels of economic development (Flachsland et al., 2009; Doda et al., 2017). The experience in this matter is in the European ETS and its link to Switzerland, the RGGI system (Regional Greenhouse Gas Initiative) in the northeast U.S., which covers several states. Perhaps the most pertinent to Chile is the 'Western Climate Initiative,' the ETS that links the subnational jurisdictions California, Ontario and Quebec, and the possible link to Mexico in the medium term. Linking or connecting ETS from different jurisdictions has some economic advantages, but also presents significant challenges. The main advantage is that an integrated ETP establishes a single price per ton (or the reduction) of CO₂ in all integrated jurisdictions. This means that although the permit cap is established, the reduction of CO₂ would be done at the lowest cost possible because of access to the lowest marginal cost of reduction in the entire integrated market. That is, it would meet the environmental objective at the lowest possible cost in those integrated jurisdictions. Nevertheless, there will be some sectors that win and others that lose. The emergence of a single price among heterogeneous economies will have an impact on competitiveness that must be addressed. However, to prepare the different sectors, the State may implement different support actions early on (training and R&TD promotion, among others) so that the technological changes are gradual and minimize economic impact. Finally, it is important to note that one of the main technical challenges of ETS that links to the systems of different jurisdictions is to 'standardize' or 'blend' their MRV systems, using the most complex subsystem for verification, as it must be reliable, transparent and traceable enough for all parties. Consequently, there are significant methodological, IT, technical and legal challenges for the integration of carbon markets.

Hybrid Systems

As mentioned before, the carbon pricing systems can be compatible. In fact, in some cases they complement each other to mitigate the difficulties associated with “pure” instruments. Such is the case for the limitations to the permits and offsetting systems, regarding the equity and distribution of impact and responsibility. The complementary models are known as hybrid systems, as they can combine taxes and emissions market systems (ETS and/or offsets).

Hybrid systems may contain a price applied to the emission as a basis for the system when transitioning towards ETS. These instruments allow for a mechanism to transfer resources,
for multiple purposes. The implementation of hybrid systems in Chile requires a solid institutional foundation for the tax with a sophisticated MRV system to support the ETS model. In fact, the hybrid ETS, with minimum and maximum prices, and auctions, are comparable to tax systems. The hybrid systems, along with taxes, not only help prevent price volatility and reduce potential policy errors in the face of uncertainty, but they help avoid problems when interacting with other climate policies (Goulder and Schein, 2013). If the offsetting option is added, this would produce more flexible alternatives for the regulated parties to meet their commitments while also generating shared benefits at the local level. A combination of different carbon pricing instruments may be implemented gradually starting with a pilot phase and expanding over time as the MRV systems are improved.

CONCLUSION

Environmental policy objectives are aimed at protecting the environment, reducing pollutant emissions and combatting climate change. Green taxes are incorporated into this system as one more available tool for meeting these objectives. Within this framework, the possibility of modifying the system has become an option for generating new instruments to contribute to the environmental objectives at a lower cost. However, prior to escalating the system, the green tax must be consolidated, and the existing capacity gaps must be bridged within the State and the regulated agencies. Then come the long-term debates on how to address the design of environmental public policy that is consistent with environmental challenges, coherent with the current institutional structure and responsible in terms of the equitable and fair distribution of pollution responsibilities and risks. That is, all instruments are viable if they are framed within environmental policy guidelines and commitments. All options for transitioning from the current green tax require technical, institutional and economic efforts for both the regulated entities and the regulators, although some need more complex designs and infrastructures and demand more resources from the State. For this reason, the political process through which these instruments shall pass must be transparent in terms of the necessary conditions, so that each of the instruments may be incorporated into environmental management. Whichever route is chosen, a wide-reaching dialogue will be necessary to focus the discussion on the policy’s main objective, framed within Chile’s commitment to becoming a low-carbon economy, within the global actions to address climate change and within the national obligations to reduce air pollution.
Regarding local and global air pollution. At the same time, the effective implementation of public policy objective: reduce pollution at a lower social cost. The viability and effectiveness of market instruments, policymakers should consider the advantages and disadvantages of linking cap and trade systems. Climate Policy, 9, 358-372.


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