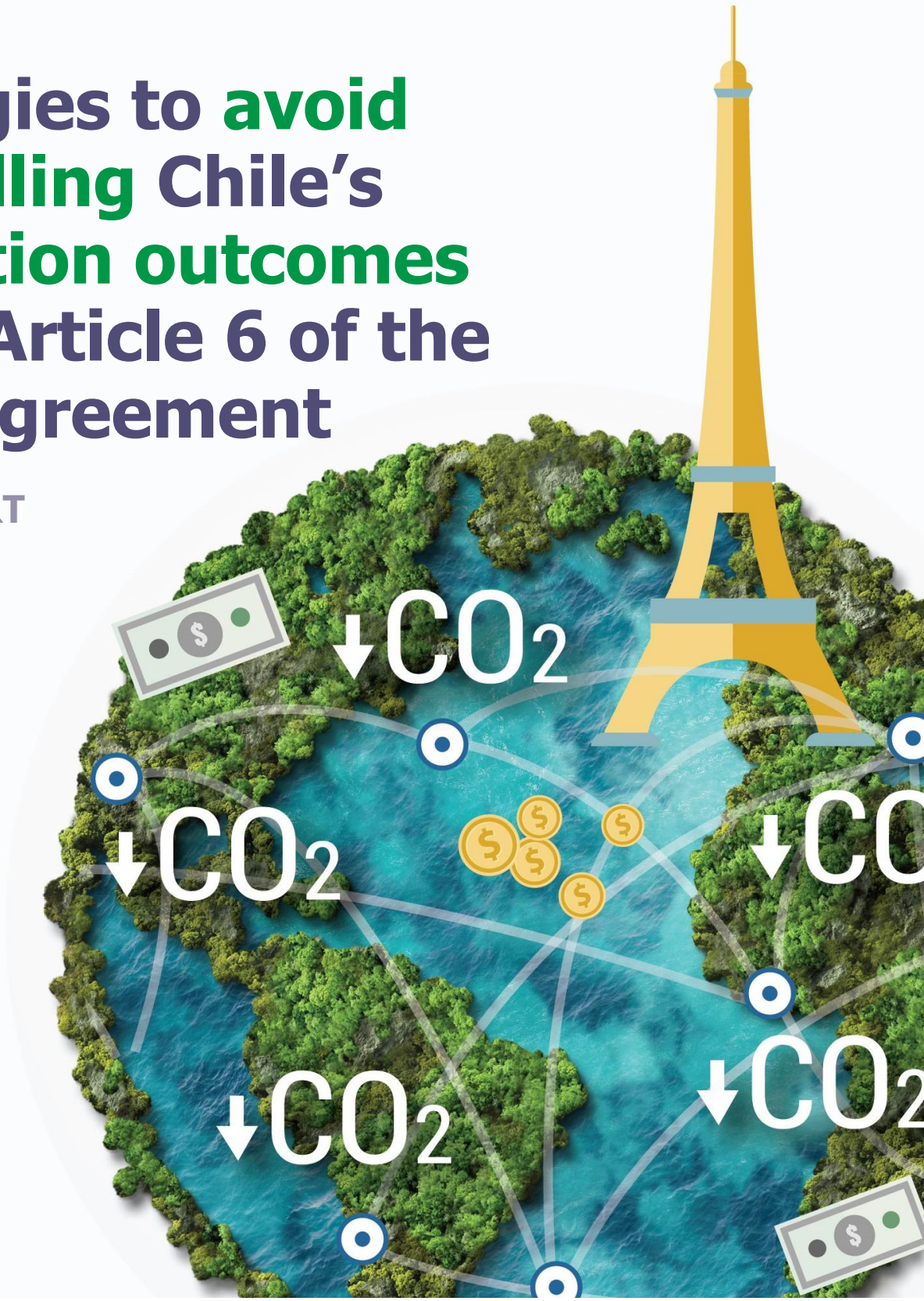
Programa de Energías Renovables y Eficiencia Energética en Chile

Strategies to avoid overselling Chile's mitigation outcomes under Article 6 of the Paris Agreement

FINAL REPORT



giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Por encargo de:
Ministerio Federal de Medio Ambiente, Protección de la Naturaleza y Seguridad Nuclear
de la República Federal de Alemania

Ministerio de Energía
Gobierno de Chile

Published by
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Friedrich-Ebert-Allee 40
53113 Bonn • Germany

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn • Germany

Project
Global Carbon Market
Alameda 1449, Piso 13 y 14, Edificio Santiago Downtown II
Santiago • Chile
T +56 22 30 68 600
I www.giz.de/www.4echile.cl

Project manager
David Fuchs

Project team
Mariela Ramos, GIZ
Isabella Villanueva, GIZ
Juan Pedro Searle, Ministry of Energy, Chile

In coordination with
Ministry of Energy
Alameda 1449, Pisos 13 y 14, Edificio Santiago Downtown II
Santiago • Chile
T +56 22 367 3000
I www.minenergia.cl

Publication title
Strategies to avoid overselling Chile's mitigation outcomes under Article 6 of the Paris Agreement

Author
WSP Ambiental SA

Santiago de Chile, 24 June 2021

Table of contents

Abbreviations

BAU	Business as usual
BUR	Biennial update report
CBIT	Capacity-Building Initiative for Transparency
CCAP	Center for Clean Air Policy
CDM	Clean Development Mechanism
CEMS	Continuous emission monitoring system
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
DNA	Designated national authority
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IPCC	Intergovernmental Panel on Climate Change
ITMO	Internationally Transferred Mitigation Outcome
JCM	Joint Crediting Mechanism
LTCS	Long-Term Climate Strategy
LULUCF	Land use, land-use change and forestry
MACC	Marginal abatement cost curve
MRV	Measurement, reporting and verification
$MtCO_2e$	Million tonnes of carbon dioxide equivalent
NDC	Nationally determined contribution
NPV	Net present value
SEA	Swedish Energy Agency
SGT-MRV	Technical Subgroup on MRV
SMA	Superintendency for the Environment
SNICHILE	National Greenhouse Gas Inventory System of Chile
SNP	National Forecasting System
tCO_2e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VU-RETC	Single Window System for the Registry of Emissions and Transfers of Pollutants
WRI	World Resources Institute

1. Introduction

Article 6 of the Paris Agreement establishes a framework for voluntary cooperation among countries in their efforts to reduce greenhouse gas (GHG) emissions, providing options for the international transfer of mitigation outcomes.

This study was conducted to propose the most suitable strategies for Chile to avoid or control the risk of overselling mitigation outcomes in the context of Article 6 transactions, taking into account the commitments it makes in its nationally determined contribution (NDC) and the national situation more broadly. It identifies requirements and gaps and also proposes a plan for its implementation. The purpose of a strategy of this kind is to ensure that Chile does not transfer to other countries mitigation outcomes that it needs to meet its mitigation commitments.

As specific rules for the operation of international carbon markets under Article 6 of the Paris Agreement have yet to be established (they are expected to form part of the negotiations at the next Conference of the Parties – COP 26 – to be held in November 2021) and Chile has still to determine how, when and under what criteria it will take part in Article 6 market mechanisms, this study aims to inform the decisions of the various institutions involved in the negotiations on this subject, including the ministries that are part of the Interministerial Task Force on Article 6.

The study begins with some helpful background information, including an overview of Article 6 of the Paris Agreement, Chile's NDC, the application of corresponding adjustments and accounting, and pilot Article 6 initiatives that are relevant to Chile.

It then proceeds to define the concept of overselling mitigation outcomes which, broadly speaking, refers to a country selling or transferring low-cost internationally transferred mitigation outcomes (ITMOs), a move that could compromise the achievement of its mitigation commitments if remaining mitigation opportunities turn out to be too expensive. There are, however, other options, such as transferring low-cost ITMOs at a higher price to generate the revenue to implement costlier measures.

Having defined the concept of overselling, the study goes on to describe the different strategies aimed at avoiding overselling mitigation outcomes. It analyses the advantages and disadvantages of each, taking into account the national context, and sets out guidance on selecting a strategy – or a combination of strategies – in different scenarios.

The study then outlines the requirements, describes the country's current situation, identifies gaps to be addressed and proposes recommendations on implementing the different strategies in three areas: readiness for Article 6 cooperation, determination of the measures required for NDC achievement and accounting, and tracking progress towards meeting NDC goals.

Lastly, it proposes an action plan to avoid or control the risk of overselling mitigation outcomes under Article 6.

2. Objective

The objective of the study is to provide recommendations for the development of a strategy to avoid overselling mitigation outcomes, identify gaps and requirements for implementation and propose an action plan to avoid or control the risk of compromising NDC achievement when participating in Article 6 carbon markets.

3. Background

3.1. Article 6 of the Paris Agreement

In general terms, Article 6 of the Paris Agreement provides a framework for countries to cooperate voluntarily in their efforts to address climate change, thus facilitating the achievement of the Agreement's objectives.

The first paragraph (Article 6.1) describes the purpose of this cooperation, which is to allow for higher ambition in mitigation and adaptation actions and promote sustainable development and environmental integrity. [1]

In the following paragraphs, three different approaches to international cooperation are established: [2]

- Article 6.2 refers to cooperative approaches where countries could opt to meet their NDCs by using ITMOs. An ITMO is a real, additional, verified unit of emission reduction or removal that can be traded between parties to the Paris Agreement and is measured in tonnes of carbon dioxide equivalent (tCO_2e). ITMOs could provide a basis for facilitating the international recognition of cross-border applications of subnational, national, regional and international carbon pricing initiatives.
- Article 6.4 establishes a mechanism for countries to contribute to GHG emissions mitigation and sustainable development. The mechanism will be supervised by a body established by the parties to the Paris Agreement. The emission reductions verified under the mechanism can be used to meet the NDC of either the host country or another country. The mechanism is intended to incentivise mitigation activities by both public and private sector entities.
- Article 6.8 recognises the importance of non-market approaches in assisting the implementation of NDCs to promote mitigation and adaptation ambition, enhance public and private sector participation and enable opportunities for coordination across instruments and relevant institutional arrangements.

Below are some key concepts associated with the rules for Article 6 implementation, as described in Version II of the report *Decoding Article 6 of the Paris Agreement*, published by the Asian Development Bank in December 2020. [3]

<u>Governance</u>

While Articles 6.2 and 6.4 both provide for mechanisms that ensure that ITMOs can be used towards meeting the buying party's NDC, governance in each is very different.

Under Article 6.2, governance is largely bilateral or multilateral and more decentralised. This means that the parties involved in the cooperation initiative will determine what constitutes an acceptable mitigation outcome, how it is measured and certified, what kind of assurance would be acceptable to both parties with regard to a corresponding adjustment being undertaken or certificates being issued, authorised and transferred, etc., according to the guidance referred to in this paragraph. The multilateral process provided for in Article 6.2 must therefore establish an acceptable way to show robust accounting, including the avoidance of double counting, and the

rules on transparency in reporting information on mitigation outcomes, transfers and associated actions. In the negotiations, the parties discuss the establishment of some sort of centralised registry, or at least a data centre, to track transactions conducted under Article 6.2, ensuring transparency and access to information on this market, which would bring this approach closer in line with the governance expected for Article 6.4.

Article 6.4, on the other hand, clearly provides for a centralised approach as mitigation outcomes are generated under the supervision of a body appointed by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA). This makes it similar to the Clean Development Mechanism (CDM) where all decisions were taken by the CDM Executive Board and associated bodies (Methodologies Panel and Accreditation Panel). As under the CDM, the discussions in the negotiations envisage that the party selling emission reductions under Article 6.4 will have to approve the transfer and issue a certificate to this effect. Furthermore, on the subject of Article 6.4, the draft negotiating text states that certain functions could be delegated to the parties (for example, baseline setting, linking certification to NDCs, accreditation of designated operational entities – DOEs) under the supervision of the supervisory body. There would therefore be a greater degree of decentralisation under Article 6.4 than under the CDM.

Environmental integrity

Environmental integrity is recognised as an important factor in relation to Article 6, but it has not yet been properly defined. One definition that is widely accepted internationally is that environmental integrity exists when a transfer of mitigation outcomes does not lead to an increase in global emissions.

The starting point for ensuring environmental integrity is the stringency with which the selling country has developed its NDC, that is, whether emission reduction targets are equal to or lower than what could be expected in a business-as-usual (BAU) scenario. When the NDC is more stringent than the BAU scenario, the environmental integrity of mitigation outcomes would be ensured for measures within the scope of the NDC, as long as the corresponding adjustments are applied (see Section 3.3) to the NDC.

In cases where the NDC is less stringent than BAU, the transfer of mitigation outcomes will also require the application of corresponding adjustments and additional measures to ensure environmental integrity with the assessment of mitigation outcome unit quality. Unit quality refers to the level of confidence that the mitigation activity transferred internationally is indeed associated with an emission reduction of at least 1 tCO_2e, or that it is the result of an actual effort to achieve a 1 tCO_2e reduction.

If the mitigation measure falls outside the scope of the NDC, the selling country and the buying country may want to ensure the unit quality of the mitigation outcome, and the selling country can also apply corresponding adjustments if it wishes to demonstrate higher climate action ambition.

Another consideration for environmental integrity is the increase in the country's climate ambition and the scope of the NDC over time to address concerns about a potential weakening of climate ambition as a result of the transfer of mitigation outcomes.

Sustainable development

Sustainable development, like environmental integrity, is a fundamental concept in the application of Article 6 and has not yet been properly defined. There are different interpretations as to what sustainable development is and how it can be demonstrated. In the CDM, for example, a simple certification from the designated national authority (DNA) indicating that the project has contributed to the country's sustainable development priorities is sufficient. However, the CDM itself later developed a voluntary tool to assess the contribution of registered projects to sustainable development.

The situation is similar for Article 6, which mentions sustainable development five times but fails to address it in sufficient depth to support its operationalisation. Without clear guidance and rules on how to promote sustainable development, there is a risk of failing to provide a mechanism that permits the delivery of tangible sustainable development contributions. However, in any attempt to provide a definition of sustainable development under Article 6, the countries, particularly those in the developing world, maintain that it is the prerogative of the parties to define and apply criteria for this concept in mitigation and adaptation projects.

According to the Special Report Global Warming of 1.5 °C published by the Intergovernmental Panel on Climate Change (IPCC) in 2018, the concept of transformation has gained momentum, particularly in the climate finance community. Advancing the concept of transformative Article 6 activity design contributes to achieving the Sustainable Development Goals (SDGs) and NDC ambition-raising and complements the additionality criteria to safeguard the environmental integrity of cooperative approaches.

Transformational change and its integration into climate change mitigation activities mainstreams sustainable development into outcomes at scale, contributing to net zero emissions by 2050.

Double counting

The double counting of emission reductions is one of the concepts still being debated in the discussions underway to finalise the Article 6 rulebook. This issue is closely linked to the environmental integrity that the Paris Agreement seeks to ensure using Article 6.

In principle, an analysis of the issue of avoiding double counting can focus on different aspects: 1) the type of double counting (double issuance and/or double usage of emission reductions); 2) what is counted (whether the activity is included in the NDC package or not); 3) what it is counted towards.

In the first case, double counting is when the same emission reduction is counted twice. For example, if Chile undertakes a mitigation effort and sells the reduction to another country, the latter cannot use that reduction as its own. Both double issuance and double usage of emission reductions need to be avoided at all costs if the credibility of actions under Article 6 is to be maintained.

In the second case, the issue is whether the accounting system should only consider ITMOs from emission reduction initiatives that fall within the scope of the NDC or whether other mitigation measures should also be eligible. As Chile's NDC covers all sectors of the economy and does not contain commitments to implement specific measures, any mitigation measure can be considered as an activity that contributes to NDC achievement. In such a context, if a country sells an ITMO it could have used to meet its targets to another country, to avoid double counting it must make sure that the emission reduction it is transferring is not counted as an emission reduction in both the host country and the buying country.

To address this issue, Article 6.2 explicitly provides that a corresponding adjustment[1] must be applied when mitigation outcomes are transferred internationally. What this means in practice is that the selling country (or the mitigation project host country) must 'un-count' any mitigation outcomes it transfers to other countries from its accounting. In other words, it must add the amount of tCO_2e it has transferred to its total emissions. For example, if it transfers 10,000 tCO_2e in emission reductions from a particular project or activity, it must add the same amount to its total emissions. This makes sense if the mitigation outcome transferred to another country could have been counted towards meeting the targets set in the host country's NDC if it had not been sold. It could therefore be assumed that this type of transfer can only take place when the mitigation

[1] The concept of corresponding adjustments is explained in more detail in Section 3.3 of this report.

outcome is from activities covered by the host country's NDC. However, as Article 6.2 does not address this issue (whether the activity is within the scope of the NDC or not), ITMOs from measures or sectors not covered by the host country's NDC can also be considered to be included, in which case corresponding adjustments must be applied.

Article 6.4 makes no reference to applying corresponding adjustments to avoid double counting. While it does not require their application, it does, however, specify that emission reductions must not be counted towards the host country's NDC if they are used by another country to demonstrate the achievement of its NDC.

The third issue under debate is determining whether double counting is being avoided towards the NDC or the inventory. Avoiding double counting towards the NDC would involve applying the corresponding adjustments to emissions covered by the NDC of the host country and the buying country. On the other hand, the avoidance of double counting towards the national inventory would require the application of corresponding adjustments to the inventories of both countries. The difference is that if a sector included in the inventory is not covered in the NDC commitments when the corresponding adjustments are made to the inventory, this will not necessarily have an effect on NDC accounting. For example, if a host country's NDC includes an emission reduction target for sector A, which generates 100 tCO_2e, but not for sector B, which generates 50 tCO_2e, and ITMOs amounting to 30 tCO_2e generated in sector B are transferred to another country, corresponding adjustments would have to be applied. In this example, the 30 tCO_2e would have to be added to the inventory of sector B, which means that sector B's emissions would be 80 tCO_2e, while sector A emissions would not be affected by the corresponding adjustment. Consequently, the host country would not have to make an extra effort to achieve its NDC as a result of having sold ITMOs. On the other hand, applying the corresponding adjustments to the NDCs of both countries would acknowledge the fact that transferring the mitigation outcome to the buying country would mean that the host country would have to make a greater effort to achieve its NDC.

Article 6 indicates that ITMOs can be used to demonstrate NDC achievement; it, therefore, makes sense that accounting and the avoidance of double counting should be towards the NDCs of both the host country and the ITMO buying country. NDCs and NDC accounting are the basis of the commitments of the parties and are critical for the global stocktake. This approach in no way diminishes the need for accurate reporting on inventories and inventory balances, adjusted for ITMO transfers, in providing a clear overall picture. In Chile's case, it will make no difference which approach is adopted as it has an economy-wide NDC.

3.2. Chile's nationally determined contribution

According to the United Nations Framework Convention on Climate Change (UNFCCC),[2] NDCs are at the heart of the Paris Agreement and the achievement of the long-term goals it establishes. NDCs embody efforts by each country to reduce national GHG emissions and adapt to the impacts of climate change.

The Paris Agreement requires each party to prepare, communicate and maintain successive NDCs, setting out the targets it intends to meet. The parties must adopt the domestic mitigation measures required to meet these targets.

[2] See https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs.

In April 2020, Chile submitted the first update of its NDC,[3] in which it sets out its climate change mitigation and adaptation targets.

Chile makes an unconditional commitment to reducing emissions to 95 $MtCO_2e$ by 2030, with a carbon budget capping GHG emissions at 1,100 $MtCO_2e$ for the period from 2020 to 2030 and GHG emissions peaking in 2025. These targets are for all sectors of the economy included in Chile's National GHG Inventory, except for the land use, land-use change and forestry (LULUCF) sector, which has its own specific targets.

The mitigation commitments for the LULUCF sector are also unconditional and include: 1) sustainable management and recovery of 200,000 hectares of native forests, representing GHG removals of around 0.9 to 1.2 $MtCO_2e$ annually by 2030; 2) afforestation of 200,000 hectares, of which at least 100,000 hectares will comprise permanent forest cover, with at least 70,000 hectares of native species; recovery and afforestation efforts will be undertaken primarily on land suitable for forest growth and/or priority conservation areas and will result in removals of between 3 and 3.4 $MtCO_2e$ annually by 2030; and 3) reduction of emissions in the forestry sector from degradation and deforestation of native forests.

Chile's NDC also includes a commitment to mitigate short-lived climate pollutants, with an undertaking to reduce total black carbon emissions by at least 25% by 2030.

Another important feature of Chile's NDC is that the targets it sets are based on an analysis that considers them as intermediate milestones on the road to achieving the long-term goal of carbon neutrality by 2050, established in the Climate Change Bill currently before Congress.

To align NDC commitments with the vision of achieving carbon neutrality by 2050, the Ministry of the Environment coordinated various intersectoral working groups to explore mitigation potential using scenario projections for the country, based on political, technological and economic criteria.

As a result, two scenarios were developed: 1) projections for national GHG emissions under current policies (up to May 2019) and 2) a carbon neutrality scenario, including measures and considerations that will help Chile achieve carbon neutrality by 2050.

Chile's NDC presents a marginal abatement cost curve (MACC) with the measures included in the carbon neutrality scenario. A MACC shows a set of mitigation measures ordered from lowest to highest cost. The abatement cost of the measures (generally expressed in USD/tCO_2) is shown on the y-axis, and their abatement potential over a given period is shown on the x-axis (generally expressed in $MtCO_2$). It is important to note that this abatement cost represents the cost associated with implementing each measure, typically expressed as the additive inverse of the net present value (NPV), divided by the mitigation potential over a given number of years. In this case, a negative abatement cost indicates a measure with an NPV higher than zero and vice versa. Therefore, when the measures are ordered from the lowest to the highest abatement cost, they are being conceptually arranged according to their implementation cost per tonne of CO_2e reduced. On the x-axis, the width of the bar represents the abatement potential, so that if the country wants to achieve a reduction of 65 $MtCO_2e$, it must implement all the low-cost measures from the first on the left until it reaches the required mitigation potential (this approach does not take into account other factors that could facilitate or hinder the implementation of these measures). The abatement cost of the last measure that enables the mitigation target to be met is called the marginal abatement cost.

[3] Chile's NDC is available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Chile%20First/Chile%27s_NDC_2020_english.pdf.

In the case of Chile's NDC, this curve shows the measures that could potentially help the country to achieve carbon neutrality, which may or may not be subsequently included in sectoral mitigation plans. This list does not, therefore, constitute a commitment to implement the measures in order to achieve the NDC. However, as will be seen below, this information needs to be available to choose the right strategy for ITMOs and control the risk of overselling mitigation outcomes. The MACC for Chile's NDC is shown in Figure 1.

The measures and the MACC presented in the NDC are the best information available on how Chile can meet its commitments by 2030 and achieve carbon neutrality. Although it is not a definitive list of measures to be implemented, at the time of writing, it is the best analysis available in the country of the type of measures that need to be implemented.

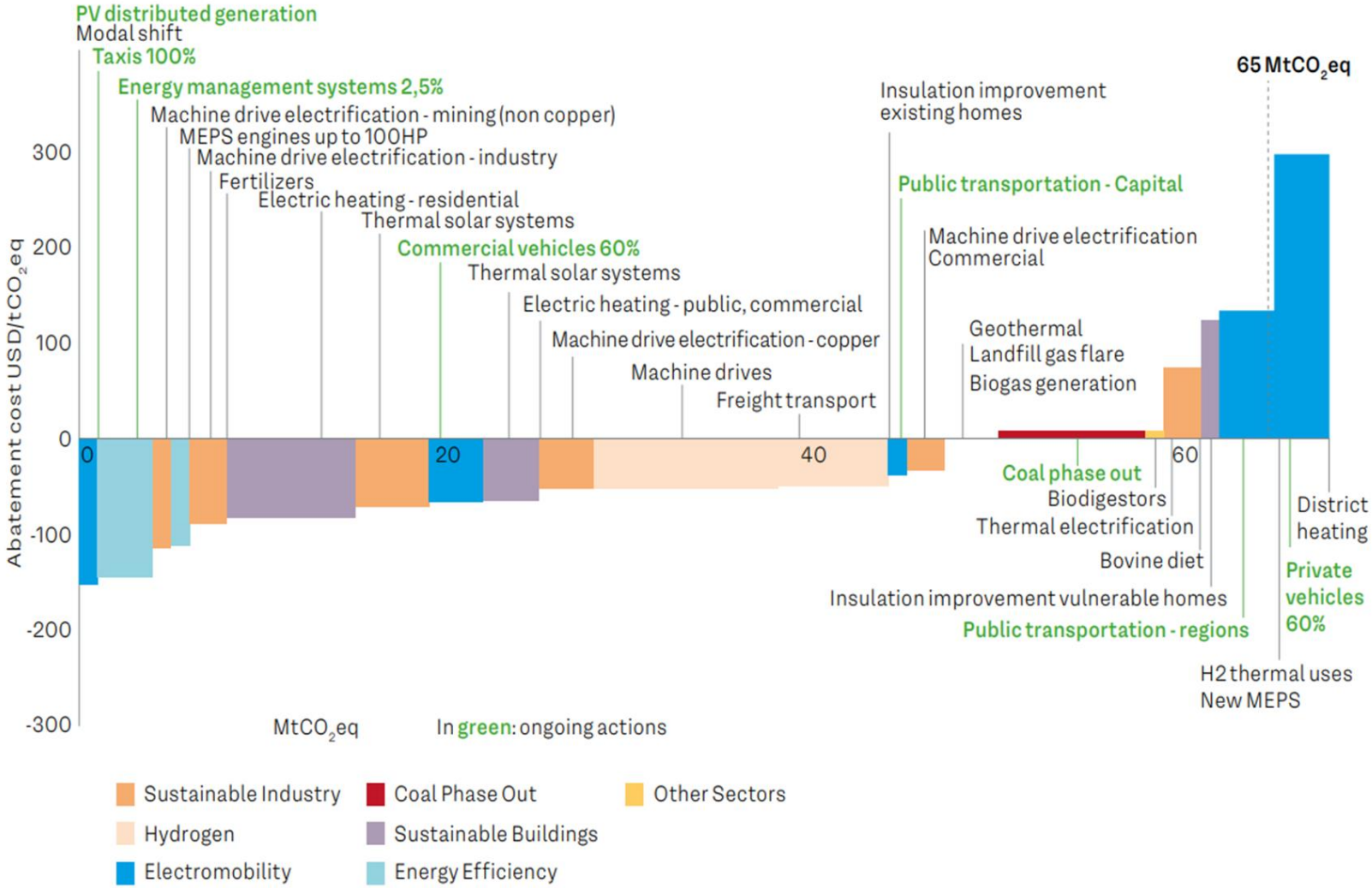


Figure 1: Marginal abatement cost curve for carbon neutrality in Chile by 2050

Source: Environment and Climate Change Division, Ministry of Energy

3.3. Corresponding adjustments and their accounting treatment

A corresponding adjustment is made when a party (host country) transfers a mitigation outcome internationally to be counted towards the NDC mitigation pledge of another party (buying country); this mitigation outcome must be 'un-counted' by the host country to prevent double counting. [5]

Although this is a straightforward concept, questions about how and when corresponding adjustments should be applied remain a salient issue in the climate negotiations for the operationalisation of Article 6.

The type of corresponding adjustment will depend on the type of targets set in the NDC. In general terms, countries either have a single-year NDC that sets targets for a specific year (for example, achieving a certain level of emissions by 2030) or a multiyear NDC that sets an emission reduction trajectory (such as establishing a 10-year carbon budget). In both cases, NDC targets are considered intermediate milestones on the road to achieving a longer-term goal. For countries that have a single-year NDC, as is the case of Chile (see Section 3.2), applying corresponding adjustments is challenging [3] because the transfer of ITMOs does not necessarily only occur in the NDC target year (2030, in Chile's case), but might take place over the whole NDC period. This must be accurately reflected in the accounting of both the host country and the buying country.

To address this, paragraph eight of the third version of the draft text of the CMA decision on guidance for cooperative approaches, referred to in Article 6.2 of the Paris Agreement,[4] sets out two potential accounting solutions on applying corresponding adjustments for countries with single-year targets. Participating parties with a single-year NDC must apply one of the following methods consistently throughout the NDC implementation period:

(i) annual trajectory – providing a multiyear emissions trajectory(ies) or annual budget for the NDC implementation period that is consistent with NDC achievement and annually applying corresponding adjustments for the total amount of ITMOs first transferred and used for each year in the NDC implementation period;

(ii) rolling average – calculating the average annual amount of ITMOs first transferred and used over the NDC implementation period, by taking the cumulative amount of ITMOs and dividing by the number of elapsed years in the NDC implementation period,[5] and applying corresponding adjustments equal to this average amount in the NDC year.

The advantage of option (i) is that it allows for transparency from the outset on the amount of ITMOs that countries can transfer or that they must buy to meet or stay below the emissions cap set in the trajectory. The challenge is that it requires the country to translate its NDC goal into annual targets. For option (ii), the buying party can only apply a fraction of the mitigation outcomes acquired (one divided by the number of years in the NDC period) towards the emissions of its NDC target year. For example, in Chile's case, corresponding adjustments equal to one-tenth of the ITMOs transferred in the NDC period could be applied for the target year (2030). The main advantage of this method is that it could raise the ambition of both trading parties, as the buying country would need to buy more ITMOs than needed in its target year.

The main challenge of this option is that it could lead to delayed engagement in carbon markets as it would only become clear at the end of the NDC period how much the country would need to buy. In addition, how much a country needs to buy (or can sell) over the entire period depends

---

[4] *Draft CMA decision on guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement*, available at: https://unfccc.int/sites/default/files/resource/DT.CMA2_.i11a.v3_0.pdf.

[5] The NDC implementation period is the time between the year the commitment is made and the final NDC target year.

on the mitigation gap or overachievement of a single year. This involves a high degree of uncertainty as emissions in 2030 could be impacted by temporary factors. [5]

3.4. Article 6 pilot initiatives relevant to Chile

Various Article 6 pilot initiatives are relevant to this analysis. The initiatives described in this section are ones in which one of the parties involved is Chile, ones that bring together countries to promote international cooperation, in which Chile is participating or could participate, and others deemed relevant because of the significant advances they have made.

Chile-Canada cooperation agreement

The Canada-Chile Agreement on Environment Cooperation, which entered into force in July 1997 at the same time as the Free Trade Agreement between the two countries, provides a framework for bilateral cooperation on environmental issues. As part of this cooperation and in light of its ratification of the Paris Agreement in 2016, Canada has offered financial and technical support to Chile to deploy technologies and pilot innovative approaches supporting the reduction of methane emissions in the waste sector through the Recycling Organics project, which is seen as a concrete example of cooperation and an opportunity to explore options for the international transfer of mitigation outcomes under Article 6. [6]

Swedish Energy Agency (SEA) virtual pilots in Chile[6]

The SEA and Chile's Ministry of Energy have worked together to promote an example of high-integrity Article 6 cooperation on renewable energy. With support from the Center for Clean Air Policy (CCAP), the virtual pilot is designed to encourage both countries to be more ambitious in meeting and exceeding their NDC goals. In carrying out this virtual pilot, they are both improving their understanding of the practicalities of developing and implementing a strong cooperative approach. This includes compliance with the requirements and expectations of the Paris Agreement and future Article 6 guidelines, to be achieved through support for Chile's long-term plans for carbon neutrality and decarbonisation of its electricity sector through incentives for 'firm and flexible' renewable energy.[7]

The project has an ambitious baseline, going further than the country's current regulations (renewable energy share increased to 20% by 2025). Any emission reductions above the baseline could be traded internationally. In other words, only mitigation outcomes from renewable energy measures additional to this 20% share by 2025 could be traded.

Preliminary analyses conducted under the pilot indicate that an emission reduction price of USD 30 per tonne could make 'firm and flexible' renewable energy sources economically competitive compared to coal-fired power plants, being lower than Sweden's carbon tax (approximately USD 137 per tonne).

Chile-Japan cooperation (JCM)[8]

Chile signed a bilateral agreement with Japan in 2015 for international cooperation through the Joint Crediting Mechanism (JCM). The JCM evaluates the contributions of projects to GHG emission reductions in quantitative terms by means of measurement, reporting and verification (MRV) methodologies and uses part of them to meet Japan's emission reduction target. Under this mechanism, part of the reductions (at least 50%, but this can vary from one project to another) go directly to the Government of Japan. Chile has not yet determined how the remaining

[6] CCAP at COP25 – Week 1
[7] In the case of Chile, 'firm' energy is energy available during the night, and 'flexible' energy is energy that provides backup for intermittent renewable energy sources.
[8] https://www.jcm.go.jp/cl-jp

reductions will be used. The JCM recently signalled the need to standardise or bring its rules into line with Article 6, which will include starting to apply corresponding adjustments to the reductions from each activity.

At the time of writing, there was one Chilean project registered under the JCM for a 1 MW photovoltaic panel system belonging to a university. There were also a further four projects at different stages in the JCM project cycle.

Carbon clubs

Chile is a member of various carbon clubs, which are groups of countries that coordinate their climate policies, facilitating cooperation among them and potentially allowing for higher climate ambition.

One of these clubs is formed by the countries aligned with the New Zealand-inspired Ministerial Declaration on Carbon Markets, which highlights the importance of the role of carbon markets in increasing climate ambition and implementing the Paris Agreement.

Chile also belongs to the World Bank's Climate Market Club.[9] Participation is voluntary and non-exclusive, and the Club is expected to include about 15 countries. The purpose of the Club is to develop arrangements to support the participants in piloting Article 6 initiatives and sharing lessons learned from practical experience. It has produced documentation on how to avoid overselling ITMOs, institutional arrangements for the use of Article 6, different approaches for developing a strategy for Article 6 application and a policy framework to be taken into account by member countries.

Chile has been invited to participate in the Climate Teams initiative,[10] which aims to provide a new model enabling host countries and buying countries to cooperate to genuinely reduce emissions globally. The initiative is promoted by the Environmental Defense Fund and seeks to reassure countries about the return on their investment in mitigation beyond their NDC and to promote private investment.

Chile-Switzerland agreement

In the second half of 2019, Switzerland (Federal Department of the Environment) and Chile (Ministry of Energy) initiated a dialogue on establishing an agreement on cooperation under Article 6.2 of the Paris Agreement. The aim was to clarify the requirements and authorisations necessary for trading ITMOs. At the time of writing, no specific agreement had been reached, but discussions have continued on this subject.

Switzerland-Peru agreement[11]

Switzerland and Peru signed their first agreement under Article 6 of the Paris Agreement in October 2020. The agreement promotes funding for projects in Peru to implement low-carbon technology and practices, including renewable energy, improved cooking stoves, sanitary landfills and rural electrification, and allows for the emission reductions to be traded between the two countries. In this way, Peru receives revenue by transferring a certain amount of mitigation outcomes, and Switzerland can use them towards meeting its NDC targets.

[9] https://www.worldbank.org/en/programs/climate-warehouse/overview
[10] https://climateteams.org/
[11] https://www.cooperacionsuiza.pe/peru-y-suiza-firman-acuerdo-de-cooperacion-que-busca-reducir-efectos-del-cambio-climatico/ (in Spanish)

Switzerland-Ghana agreement[12]

In November 2020, Switzerland and Ghana signed a bilateral agreement under Article 6 of the Paris Agreement, the first such agreement involving an African nation. It aims to catalyse private sector investment in Ghana's national energy access programme, implementing technology initiatives that will benefit more than five million households, including improved cooking stoves and solar photovoltaic installations. Ghana is exploring other options to implement more projects under the agreement.

4. Concept of overselling mitigation outcomes

The concept of the risk of overselling mitigation outcomes can be interpreted in different ways as there are different situations in which the risk of transferring mitigation outcomes can be detrimental to the host country (making it difficult for it to achieve its NDC goals) and, ultimately, to the planet (increasing global emissions). The description of the four types of overselling risk provided below is based on the report *Practical strategies to avoid overselling*. [7]

Table 1: Types of overselling risk

Type of risk	Description	Example
Selling low-cost mitigation outcomes, which could compromise NDC achievement if remaining mitigation opportunities turn out to be too expensive	If a country sells low-cost mitigation outcomes, it must then consider higher-cost measures to meet its NDC targets, which could make it more difficult for it to achieve its NDC goal.	In the case of Chile, switching to electric vehicles in the commercial sector has a negative abatement cost. If Chile were to sell emission reductions from this mitigation measure, it would have to consider a measure with a higher abatement cost, that is, with a higher implementation cost per tonne of CO_2 reduction, to meet NDC targets.
Selling mitigation outcomes that do not represent real reductions	If the mitigation activities are non-additional, then emissions will not decrease in relation to BAU. When the corresponding adjustments are applied, the host country's emissions will increase, taking it further away from its goal. A similar problem would occur if the emission reductions of a project were overestimated, in that the corresponding adjustments would be greater than the actual reduction in emissions in the inventory.	If a mitigation measure were to set an emission baseline that was higher than the actual emissions (for example, assuming the worst-case scenario in terms of emissions), the emission reduction from that measure would be overestimated. If the reduction is estimated at 100 tCO_2, but the real impact is 70 tCO_2, the effect on the national inventory is a decrease of 70 tCO_2, but when the corresponding adjustments are applied, the inventory would be increased by 100 tCO_2, so that the net effect on the inventory would

[12] https://www.undp.org/press-releases/switzerland-and-ghana-sign-historic-agreement-climate-action

Type of risk	Description	Example
		be an increase of 30 tCO_2 (100 tCO_2 minus 70 tCO_2).
Selling mitigation outcomes for which the reduction in emissions will not be captured by the host country's GHG inventory	In some countries, the GHG inventory system might not be detailed enough to capture the actual emission reductions achieved by some measures. This means that, when the corresponding adjustments are applied, the emissions reported by the host country will increase.	In the solid waste disposal category in Chile's National GHG Inventory, emissions for industrial solid waste are estimated based on the amount of waste reported by each company to the National Waste Reporting System. If a mitigation initiative were to address the issue of waste not reported under the system, an emission reduction would be quantified but its effect would not be reflected in the inventory. Therefore, the transfer of mitigation outcomes to other countries would have the effect of increasing emissions in the inventory when the corresponding adjustments were applied.
Selling mitigation outcomes generated outside the scope of the NDC if the international rules require the application of corresponding adjustments for such transfers	If a host country transfers mitigation outcomes from measures outside the scope of its NDC, they will not be reflected in its inventory as an advance towards meeting its NDC goal and the application of the corresponding adjustments would take it further away from this goal.	As Chile's NDC encompasses all sectors of the economy, there is no risk of overselling mitigation outcomes generated outside the scope of the NDC.

Source: Compiled by the authors from *Practical strategies to avoid overselling* (Carbon Limits, 2020) [7]

This study focuses on strategies to avoid the first type of overselling risk (selling mitigation outcomes from low-cost measures) as it is considered to be the most significant risk. Although Chile could face risks associated with selling mitigation outcomes that do not represent real reductions, or for which the reduction in emissions will not be captured by the national inventory, these risks are considered to be low.

The first risk shown in the table is one that would arise if the host country decided to sell a certain type of low-cost measure that it could have used directly to achieve its own NDC. In this case, the risk is associated with the decision to 'hand over' this mitigation potential to another country, regardless of the potential sales price of the emission reductions (price of the transaction, which is not the same as the measure's implementation cost).

The following section sets out the different strategies for reducing or avoiding the risk of overselling low-cost mitigation outcomes. Some include or exclude certain measures while others share the mitigation outcomes between the buying country and the host country. It also analyses strategies that involve providing a reserve fund that can be used by the host country to implement mitigation measures with a higher implementation cost. This type of strategy does not directly

reduce the risk of overselling mitigation outcomes, but it does provide for committing new resources to implement higher-cost measures, thus reducing the risk of failing to achieve NDC goals.

5. Strategies to avoid overselling mitigation outcomes in Chile

5.1. Description and analysis of strategies to avoid overselling mitigation outcomes

To determine the best strategies for Chile to avoid overselling mitigation outcomes, the strategies detailed in the report *Practical strategies to avoid overselling* [7] are taken as a starting point. They are evaluated here to establish which are the most suitable, considering the current context in Chile, in particular its NDC.

As a preliminary step to choosing the most suitable strategies for Chile, the study must prioritise the mitigation measures to be implemented to achieve the NDC. This means identifying the 'NDC package' of actions and, ideally, clarifying the role that Article 6 cooperation will have in the country's long-term low-carbon development strategy (or similar instrument).

Identifying the NDC package involves drawing up a list of measures that the country intends to implement to meet its commitments. The criteria for selecting these measures can take into account various factors. The main one would probably be the abatement cost and abatement potential of the measures. Other factors to be considered when identifying the NDC package are alignment with the country's policy priorities (for example, measures that are important for socio-economic reasons might be prioritised even if they have a relatively low mitigation potential) and the political and practical feasibility of implementing the mitigation measures (for example, there may be mitigation measures with a low abatement cost that are ruled out because of a lack of the technical, institutional and management capacities required for their implementation).

As part of its NDC update, Chile analysed different mitigation measures, quantifying their mitigation potential and abatement cost up to 2050. This analysis provides valuable input for establishing the NDC package. It is represented graphically in the MACC shown in Section 3.2. To finalise the process of establishing the NDC package, the country must refine the MACC, considering the information generated in the course of developing future sectoral mitigation plans, to identify priorities and the feasibility of implementing the measures analysed and, if appropriate, including additional mitigation measures. This is discussed in greater detail in Section 6.2.

A detailed MACC showing national mitigation options and their abatement cost and potential and taking into account measures that should be excluded or included for political reasons or based on their feasibility, enables the country to establish the set of measures needed to achieve NDC commitments, known as the NDC package.

Table 2 shows the different types of strategies, which are described in sections 5.1.1 to 5.1.3 below.

Table 2: List of strategies to avoid overselling mitigation outcomes by type

Strategies to avoid overselling mitigation outcomes	
Strategies to exclude or include measures	Strategies to share mitigation outcomes
• Negative list to exclude activities from the NDC package • Using Article 6 to implement 'inaccessible' technologies • Abatement cost threshold for Article 6 activities • Baselines derived from NDC goals	• Simple division of mitigation outcomes from cooperation activities (between seller and buyer) • Limiting crediting periods • Using conservative baselines • Conditionality on transfers
Strategies to provide a reserve fund	
• Charging a levy on transfers to fund a mitigation outcome reserve or future ITMO purchases • Using higher pricing to reflect the opportunity cost	

Source: Compiled by the authors from *Practical strategies to avoid overselling* (Carbon Limits, 2020) [7]

The sections below describe each of these strategies, outlining their advantages and disadvantages. Based on a comparison of the strategies, the question of which strategy or combination of strategies is most suitable for Chile is then discussed.

The strategies to provide a reserve fund listed in the table above do not contribute directly to preventing the overselling of mitigation outcomes but set aside revenue from the sale of ITMOs in a reserve fund that can be used to finance, or contribute to financing, high-cost mitigation measures and/or cover the cost of infrastructure and governance for project approval, transaction authorisation, implementing an MRV system, etc.

5.1.1. Strategies to exclude or include measures

This section describes of strategies aimed at screening out or including measures and their advantages and disadvantages.

In general terms, the main requirement for implementing this type of strategy successfully is to prepare a list of the measures to be implemented, detailing implementation costs and times and abatement potential. This information is then used to decide which measures should be included in or excluded from Article 6 cooperation. Chile developed a MACC based on its NDC, covering all the emitting sectors included in its National GHG Inventory. It therefore has the basis for the next steps in implementing this type of strategy. Chapter 6 describes requirements for the implementation of such strategies, provides an overview of the country's current situation and puts forward recommendations.

5.1.1.1. Negative list to exclude measures forming part of the NDC package

This strategy involves using the list of measures included in the NDC package as a 'negative list', that is, the list of mitigation activities where Article 6 cooperation would not be allowed. Article 6 cooperation initiatives would thus focus on the measures and technologies that the country could not implement itself or that, for some other reason, were left out of the NDC package.

The level of detail of the measures on the negative list would, in this case, depend on the level of detail in the original analysis of measures included in the NDC package. If the NDC package only

included large-scale projects for a particular type of measure or activity, smaller projects of this kind would not be on the negative list (for example, if the NDC package included renewable energy projects of more than 15 MW, smaller-scale renewable energy projects would be allowed for Article 6 cooperation).

Initially, this strategy would screen out all NDC package measures for Article 6 cooperation activities. However, the strategy can be adjusted, excluding only a subset of measures, and/or combined with other strategies, depending on the country's priorities and goals. For example, different strategies can be considered depending on whether the country aims to use Article 6 cooperation to ensure it achieves its current NDC goals or whether it sees it as a way of increasing its mitigation ambition.

It is important to note that this strategy aims to exclude, or include, the measure as a whole, which means that any project implementing such a measure would have to follow the same inclusion or exclusion criteria. However, some of the other strategies described below only limit Article 6 cooperation activities for some of the projects that implement a particular measure.

The main advantages of this strategy are:

- Project developers can easily see beforehand if their projects would be excluded or not from being part of Article 6 cooperation initiatives.
- It can be implemented quickly if the country already has an NDC mitigation analysis detailing the measures to be carried out, their mitigation potential, implementation cost and time and/or an appropriate implementation plan for mitigation measures. Chile has experience in mitigation option analysis and in preparing MACCs, but it has not drawn up a definitive list of mitigation measures for NDC achievement. It is important to take into account that the analysis was carried out before the preparation of sectoral budgets and mitigation plans, which could critically influence the choice of mitigation measures that would ultimately be implemented to meet commitments.
- The implementation cost for the government is low if the mitigation option analysis is available.

The main disadvantages are:

- The NDC mitigation analysis must be available for this strategy to be implemented.
- As it screens out all projects of a certain type or involving a particular technology, it could prevent the country from selling mitigation outcomes it achieves above the emission reduction required to meet its NDC targets. For example, if a country establishes that in order to meet its commitments for a given period it must achieve 50% penetration of electric passenger vehicles and then exceeds this target, attaining 60% penetration in the same period, it would not be able to sell this surplus because the measure is on the negative list.
- It does not allow Article 6 cooperation to be used as an incentive to speed up the implementation of measures included in the NDC package. The package might include types of projects whose large-scale implementation could be accelerated by carrying out pilot projects, but as the activity is barred from Article 6 cooperation, project developers might be deterred from doing so because they would not be able to reap the potential benefits.
- Mitigation outcomes from projects with low abatement costs could potentially be sold if that particular type of measure was not included in the original mitigation analysis.

5.1.1.2. Use of Article 6 to implement inaccessible technologies

This strategy involves creating a 'positive list' of measures that the country would not be able to implement without outside support, that are not therefore part of the NDC package, and allowing Article 6 cooperation for these measures only. These mitigation measures may be considered inaccessible for various reasons, including high abatement costs and technical and regulatory barriers.

Inaccessible technologies could be identified by looking at factors such as the maturity of a technology and its cost. For example, the positive list could contain high-cost emerging technologies or technologies requiring technical expertise not yet available in the country.

This strategy of allowing measures involving inaccessible technologies for Article 6 cooperation can be tailored to include other measures and/or be combined with other strategies, depending on the country's priorities and goals.

It is important to note that this strategy establishes a positive list allowing certain technologies, which means that any project involving such measures must follow the same inclusion or exclusion criteria. Factors such as scale and the application or use of the technology must also be taken into account. For example, the positive list could include a certain technology for implementation on an industrial scale but not on a domestic scale.

The main advantages are that:

- it is transparent for all those involved as it allows Article 6 cooperation for a list of clearly defined technologies.
- as in the case of the negative list strategy, having a detailed mitigation analysis facilitates the implementation of the strategy as measures with a high abatement cost or facing other barriers could be selected for inclusion on the positive list;
- the implementation cost for the government is low if the mitigation analysis is available.

The main disadvantages are that:

- as in the case of the negative list strategy, the NDC mitigation analysis must be available for this strategy to be implemented.
- the measures on the positive list might not be available in the future to contribute to meeting NDC targets, especially if agreements to transfer mitigation outcomes are extended into the following NDC cycle.
- as with the negative list strategy, it could reduce the incentive to accelerate the implementation of measures left off the positive list. For example, there might be projects that could contribute to meeting the country's commitments but are not on the list of inaccessible technologies allowed for Article 6 cooperation (positive list), in which case project developers might be deterred as they would not be able to reap the potential benefits of pioneering implementation of the measure in question.
- Measures not considered in the original mitigation analysis would not be allowed.

5.1.1.3. Abatement cost threshold for Article 6 activities

An alternative to specifying which activities are or are not allowed for Article 6 cooperation, as in the strategies described above, is to set an abatement cost threshold above which cooperation activities are allowed. The cost threshold would be set at the marginal cost of meeting the NDC goal, that is, the abatement cost of the costliest of the measures required for NDC achievement. Only activities whose abatement costs were above this threshold would be allowed for Article 6 cooperation. This is an indirect way of ensuring that NDC package measures are reserved for achieving the NDC but is a more flexible strategy than those described above.

This strategy uses an abatement cost threshold as the cut-off point for determining which activities are eligible, so that any measure with a cost above this threshold is allowed for Article 6 cooperation. Unlike the 'Negative list to exclude activities from the NDC package' strategy described above, which excludes certain types of measures, there is no need to list the measures that are excluded. This means that if a new measure emerges in the future that has not been considered in the original analysis, its abatement cost will determine whether or not it is allowed for Article 6 cooperation.

Although this strategy uses as the threshold the abatement cost of the costliest of the measures required for NDC achievement, a different threshold can be used in line with the country's priorities and goals.

The main advantages are that:

- like the negative list strategy, it can be implemented quickly if the country's NDC mitigation analysis and/or an appropriate implementation plan for mitigation measures are available, in other words, if the country has already calculated the abatement cost of the measures included in its NDC.
- low-cost measures are reserved for NDC achievement.
- measures not considered in the original mitigation analysis would be allowed for Article 6 cooperation if they have an abatement cost above the threshold.

The main disadvantages are that:

- as for the negative list strategy, the NDC mitigation analysis must be available for this strategy to be implemented.
- it is difficult to calculate, present and justify the abatement cost because the costs specified in the analysis are economic and not accounting costs. In some cases, this could lead to costs being overestimated or to less efficient means of implementation being considered so that the abatement cost exceeds the threshold, and the measure is allowed for Article 6 cooperation;
- low-cost measures left out of the NDC package because of other barriers to implementation would effectively be barred from Article 6 cooperation.

5.1.1.4. Baselines derived from NDC goals

Under this strategy, only mitigation activities that go further than what the country has committed to in its NDC would be allowed for Article 6 cooperation. NDC mitigation commitments are incorporated into the baseline, and any mitigation measures above this baseline are considered eligible.

In Chile's case, for example, the assumptions for measures under the NDC carbon neutrality scenario can be taken as the baseline. For the measure aimed at increasing electric taxi penetration, the MACC for the carbon neutrality scenario includes 100% electric taxis by 2050. Making certain assumptions, the penetration rate for 2030 can be determined. Assuming 0.15% penetration in 2020 (151 electric taxis licensed[13] out of a total of 101,506 taxis as of November of that year[14]) and annual targets based on linear growth of electric taxi penetration from 2021 to 2050, annual targets can be set up to 2030, as shown as percentages in the table below.

[13] Article 'Chile cuenta con 151 taxis eléctricos a noviembre del año pasado' available at: https://www.electromov.cl/2021/01/04/chile-cuenta-con-151-taxis-electricos-a-la-fecha/.

[14] Public transport databases available at: https://usuarios.subtrans.gob.cl/estadisticas/parques-vehiculares.html.

Table 3: Annual targets for electric taxi penetration up to 2030

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Electric taxi penetration (%)	3	7	10	13	17	20	23	27	30	33

Source: Compiled by the authors

Under this strategy, the penetration rates shown in the table above would be used as the baseline. Therefore, based on these assumptions, only the emission reductions achieved by electric taxi projects additional to the target for the corresponding year could be traded under Article 6. For example, if electric taxi penetration was 13% in 2023, the target for that year (10%) would have been exceeded and the reductions corresponding to the additional penetration (3%) could be traded under Article 6. On the other hand, if 13% penetration was reached in 2024, there would be no surplus and no reductions from electric taxi projects could be traded in that period.

Unlike the strategies described above, Article 6 cooperation is not limited by the type of technology or abatement cost but by NDC commitments on mitigation measures, taking into account the technology involved and the expected penetration rate, as established in the NDC. As the mitigation commitments set out in Chile's NDC do not stipulate specific measures, this strategy could not currently be implemented.

The main advantage of this strategy is that:

- it only allows the use of mitigation outcomes that go beyond NDC commitments for Article 6 cooperation, without being as restrictive and inflexible as the strategies involving a positive or negative list.

However, the main disadvantage is that:

- the ease with which NDC-linked baselines can be developed depends on how a country's NDC commitments are specified and how they are to be achieved. Chile's NDC establishes economy-wide mitigation commitments but does not provide a breakdown of specific targets or trajectories by sector or technology. Chile cannot therefore develop NDC-linked baselines at present. The development of sectoral mitigation plans setting targets and/or trajectories for NDC achievement could make it possible to develop baselines for the implementation of a strategy based on a similar approach. This is discussed in greater detail in Section 6.2.

The table below summarises the advantages and disadvantages of the four strategies that exclude or include mitigation measures.

Table 4: Comparison of strategies to exclude or include mitigation measures

Advantages and disadvantages	Negative list to exclude activities from the NDC package	Using Article 6 to implement inaccessible technologies	Abatement cost threshold for Article 6 activities	Baselines derived from NDC goals
Advantages				
It is easy to determine beforehand if a project would be included or excluded.	●	●		
It is easy to implement if the country already has a mitigation analysis detailing the measures to be implemented for NDC achievement.	●	●		
Implementation costs are low if the country already has a mitigation analysis.	●	●	●	
Low-cost measures are reserved for NDC achievement.			●	
Measures not considered in the original mitigation analysis could be allowed for Article 6 cooperation.			●	
Any measure going further than the country's NDC commitments is allowed for Article 6 cooperation.				●
Disadvantages				
The NDC mitigation analysis must be available for this strategy to be implemented.	●	●	●	
As it screens out all projects involving a certain type of technology, it could prevent the country from selling mitigation outcomes from specific projects that go further than the emission reductions required to meet its NDC commitments.	●			
It does not allow, or it hinders the use of Article 6 cooperation as an incentive to speed up the implementation of measures included in the NDC package.	●			
Mitigation outcomes from projects with low abatement costs could potentially be sold if the measure was not included in the original mitigation analysis.	●			
Measures included on the positive list would not be available to contribute to meeting NDC targets.		●		

Advantages and disadvantages	Negative list to exclude activities from the NDC package	Using Article 6 to implement inaccessible technologies	Abatement cost threshold for Article 6 activities	Baselines derived from NDC goals
It could reduce the incentive to accelerate the implementation of initiatives not included on the positive list.		●		
Measures not considered in the original mitigation analysis would be excluded.		●		
It is difficult to calculate, present and justify abatement costs.			●	
Low-cost measures left out of the NDC package because of other barriers to implementation would effectively be barred from Article 6 cooperation.			●	
It is difficult to implement if the NDC mitigation commitments do not provide a breakdown of specific targets or trajectories by sector or technology, which is the case with Chile's NDC.				●

Source: Compiled by the authors

5.1.2. Strategies to share mitigation outcomes

5.1.2.1. Simple division of mitigation outcomes from cooperation activities

This is perhaps the simplest strategy. It allows a wide range of Article 6 cooperation activities but only enables a certain proportion of the mitigation outcomes from them to be transferred internationally. The remaining mitigation outcomes can be used towards the host country's NDC. The strategy might use a fixed share set upfront for all mitigation outcomes or it might vary by sector or even project type.

The main advantages are that:

- the strategy is transparent and simple for those involved.
- it can promote pilot projects implementing innovative measures or technologies as it does not restrict Article 6 cooperation by project type.

The main disadvantages are that:

- it is difficult to determine what amount of mitigation outcomes could be transferred and what amount should be reserved to meet the host country's NDC commitments. It is important to achieve the right balance so that the host country keeps enough mitigation outcomes for itself, while at the same time ensuring that the cooperation activity remains attractive to the buying country.
- if Article 6 cooperation involves measures included in the NDC package, the cost of NDC achievement is likely to rise because the transferred mitigation outcomes will have to be replaced by emission reductions from measures with a higher abatement cost.

Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended, given the disadvantages indicated above, in particular the potential increase in the cost of achieving its NDC.

5.1.2.2. Limiting crediting periods

Crediting periods that are longer than the frequency with which the NDC is updated could lead to a higher risk of overselling because of the higher ambition and wider scope that can be expected with an NDC update. Having crediting periods that are shorter than the interval between updates can therefore help protect against overselling mitigation outcomes. It limits the years during which the host country will sell its mitigation outcomes and allows it to use them earlier for the achievement of its own NDC.

The main advantages are that:

- the strategy is transparent and simple for those involved.
- the crediting period is established at the outset, which means that the government burden is lower than for other approaches in terms of regularly updating the NDC package or crediting baseline.
- it can promote pilot projects involving innovative measures or technologies as it does not limit Article 6 cooperation by project type. If there is a detailed implementation schedule for mitigation measures, mitigation outcomes from such projects could be sold in the period before the measure is scheduled to be implemented.

The main disadvantages are that:

- it is difficult to determine what length the crediting period should be. It must be a period that makes the cooperation activity an attractive option for the buying country and that also enables the host country to have kept enough mitigation outcomes by the end of it.
- care must be taken to avoid a situation in which shorter crediting periods lead to a bias towards investments with shorter payback times.
- if Article 6 cooperation involves measures included in the NDC package, the cost of achieving the NDC is likely to rise because the transferred mitigation outcomes will have to be replaced by emission reductions from measures with a higher abatement cost.

Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended, given the disadvantages indicated above, in particular the potential increase in the cost of achieving its NDC.

5.1.2.3. Use of conservative baselines

This strategy involves using a more conservative baseline, that is, with higher ambition than the NDC, so that the amount of mitigation outcomes transferred as part of Article 6 cooperation is lower than those actually generated. The difference can then be used to meet the host country's commitments. Unlike the strategy described in Section 5.1.1.4, where the baseline is linked to NDC goals, in this case, the strategy aims to set a more ambitious baseline than one derived from the NDC would be. This approach provides a very conservative estimate of a measure's emission reductions, so that actual mitigation outcomes from its implementation are greater than the emission reductions estimated based on the conservative baseline and internationally transferred.

Under this strategy, the host country would sell mitigation outcomes according to the conservative estimate, but as the real mitigation impact would be higher than the outcomes sold, it would have 'surplus' emission reductions.

In principle, this strategy involves developing a conservative baseline in line with the long-term goals of the Paris Agreement. Two methods for setting a baseline under this strategy are: (a)

establishing a new long-term trajectory, known as a long-term nationally determined contribution or (b) setting baselines in line with the long-term goals of the Paris Agreement. Other methods can also be used, if they set a baseline that is more ambitious than one derived from the NDC goals.

The first option would establish the long-term nationally determined contribution for the sectors earmarked for mitigation activities. The second would create a baseline that is a linear interpolation between current emissions and zero emissions in the year the Paris Agreement goals could be expected to be met. For example, if a new building constructed in 2020 emits 6 tCO_2/m^2 a year, the baseline for an energy-efficient building measure would be set according to a linear trajectory that would start at 6 tCO_2/m^2 in 2020 and fall to 4 tCO_2/m^2 in 2030, 2 tCO_2/m^2 in 2040 and finally 0 tCO_2/m^2 in 2050; emission reductions would then be measured against this baseline. Therefore, if the mitigation measure aimed to bring the level of emissions down to 3 tCO_2/m^2 by 2030, the country would have an emission reduction of 1 tCO_2/m^2 in 2030 that it could sell.

The main advantage is that:

- it provides a good option for setting a conservative baseline when the NDC is not specific enough.

The main disadvantages are that:

- the procedures for developing the conservative baseline require different kinds of assumptions about setting targets in line with the long-term goals of the Paris Agreement.
- the effort required to develop the conservative baseline might be seen as tantamount to rewriting the NDC.
- if Article 6 cooperation involves measures included in the NDC package, the cost of NDC achievement is likely to rise because the transferred mitigation outcomes will have to be replaced by emission reductions from measures with a higher abatement cost.

A conservative baseline consistent with the long-term goals of the Paris Agreement needs to be developed for this strategy to be implemented. Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended given the disadvantages indicated above, in particular the potential increase in the cost of achieving its NDC.

5.1.2.4. Conditionality on Article 6 transfers

This strategy involves making all transfers of mitigation outcomes conditional on the host country meeting or being on track to meet its NDC targets. In other words, although various Article 6 cooperation agreements might be signed during the NDC period,[15] no transfers would be authorised until the end (or nearly the end) of the period, once the NDC targets had been met.

Although this strategy involves evaluating the achievement of NDC goals at the end or near the end of the NDC period, intermediate milestones could also be established and transfers authorised when the host country met these milestones, showing that it is on track towards achieving its NDC.

[15] The period between the time the NDC goals are set and the final NDC target year. Chile's current NDC period ends in 2030.

The main advantage is that:

- it eliminates the risk of overselling mitigation outcomes.

The main disadvantage is that:

- it would most likely stifle interest from buying countries as there would be no guarantee that the mitigation outcomes would eventually be transferred. This issue could be addressed by transferring a portion of the emission reductions achieved during the NDC period and holding back the remainder until the end when it would be clear if the host country was going to meet its targets.

Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended, as it could severely limit international cooperation.

The table below provides a summary of the advantages and disadvantages of the four strategies that involve sharing mitigation outcomes.

Table 5: Comparison of strategies to share mitigation outcomes

Advantages and disadvantages	Simple division of mitigation outcomes from cooperation activities	Limiting crediting periods	Use of conservative baselines	Conditionality on Article 6 transfers
Advantages				
It is transparent and simple for those involved.	●	●		
It can promote pilot projects involving innovative measures or technologies as it does not limit Article 6 cooperation by project type.	●	●		
The crediting period is established at the outset, which means that the government burden is lower than with other strategies in terms of having to regularly update the NDC package or crediting baseline.		●		
It provides a good option for setting a conservative baseline when the NDC is not specific enough.			●	
It eliminates the risk of overselling mitigation outcomes.				●

Advantages and disadvantages	Simple division of mitigation outcomes from cooperation activities	Limiting crediting periods	Use of conservative baselines	Conditionality on Article 6 transfers
Disadvantages				
If Article 6 cooperation involves measures included in the NDC package, the cost of achieving the NDC is likely to rise because the transferred mitigation outcomes will have to be replaced by emission reductions from measures with a higher abatement cost.	●	●	●	
It is difficult to determine what amount of mitigation outcomes could be transferred and what amount should be reserved to meet the host country's NDC commitments.	●			
It is difficult to determine what length the crediting period should be.		●		
Care must be taken to avoid a situation in which shorter crediting periods lead to a bias towards investments with shorter payback times.		●		
The procedures for developing the conservative baseline require different kinds of assumptions about setting targets in line with the long-term goals of the Paris Agreement.			●	
The effort required to develop the conservative baseline might be seen as tantamount to rewriting the NDC.			●	
It would most likely stifle interest from buying countries as there would be no guarantee that the mitigation outcomes would eventually be transferred.				●

Source: Compiled by the authors

5.1.3. Strategies to provide a reserve fund

These strategies consist in setting aside revenue from the sale of ITMOs in a reserve fund that can be used to finance or contribute to financing high-cost mitigation measures and/or cover the cost of infrastructure and governance for project approval, transaction authorisation, MRV system implementation, etc.

It is important to note that these strategies do not contribute directly to preventing the overselling of mitigation outcomes.

5.1.3.1. Charging a levy on transfers to fund a mitigation outcome reserve or future ITMO purchases

This strategy consists in allowing the transfer of all mitigation outcomes generated during the NDC period and charging a levy or tax on them to provide a reserve fund, which the host country could then use to invest in domestic mitigation measures, purchase mitigation outcomes from other countries to meet its NDC targets or invest in the infrastructure necessary to implement Article 6 cooperation in the country. It could be a fixed levy applicable to all projects or could vary according to project type.

Although, in principle, under this strategy, the levy would be charged on every mitigation outcome transferred internationally, alternatively, or additionally, it could be charged on a percentage of the emission reductions transferred, considering that part of the mitigation outcomes will remain in the country and not be transferred, as happens with the CDM reserve fund.

The main advantages are that:

- the strategy is transparent for all those involved.
- it enables resources to be generated to fund other mitigation measures with a higher cost than those transferred internationally.

The main disadvantages are that:

- it would potentially limit the host country's ability to transfer mitigation outcomes as prices would be less competitive.
- it would only address the risk of overselling mitigation outcomes if the levy were high enough to raise sufficient revenue to make up any shortfall between NDC targets and actual emissions during the NDC period. This would depend on the cost of alternative mitigation options domestically (which would, in all likelihood, be higher than those included in the original NDC package) and/or the price and availability of mitigation outcomes on the international market, which would also be highly uncertain.

Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended, given its disadvantages, particularly uncertainty about reducing the risk of overselling.

5.1.3.2. Using higher pricing to reflect the opportunity cost

According to the study *Practical strategies to avoid overselling*, [7] this strategy involves selling mitigation outcomes at no less than the marginal cost of NDC achievement[16] and is applicable in cases where the abatement cost of a specific measure is lower than the marginal cost of NDC

[16] When the measures in the NDC package are ranked from the lowest to the highest abatement cost, the marginal cost of NDC achievement is the abatement cost of the measure following the last one that enables the NDC emission reduction commitment to be met.

achievement. This approach assumes that the project developer will want to sell its mitigation outcomes at a price equivalent to the abatement cost; in practice, this is not always necessarily the case. It is important here to differentiate between the abatement cost and the selling price. The abatement cost is generally determined as the additive inverse of the NPV, divided by the mitigation potential over a given number of years. An abatement cost above zero indicates that the measure has a negative NPV and vice versa. On the other hand, the selling price is an amount agreed between the seller and the buyer, influenced by interest, and need, and can be higher or lower than the abatement cost. Depending on each individual economic assessment, project developers might find that selling their emission reductions at the marginal cost of the measure is not attractive if they do not manage to achieve a positive NPV with the revenue obtained.

As with the previous strategy, the final selling price is considered to be made up of a price for the project developer and an additional amount for the host country, which could potentially be used to fund mitigation measures domestically or buy mitigation outcomes from other countries in order to achieve its NDC.

Under both strategies, the government would receive an amount for each international transfer of mitigation outcomes; the difference is that this strategy aims to set a final selling price for all the mitigation outcomes transferred, while the previous one uses a levy on the emission reduction that is transferred.

The main advantages are that:

- the strategy is transparent for all those involved.
- it would allow measures from all NDC sectors to be used for Article 6 cooperation.
- it could allow the additional revenue to be directed to wherever it was needed to ensure NDC achievement.

The main disadvantages are that:

- for this strategy to be implemented, the NDC mitigation analysis must be available and the specific abatement cost of the activity to be carried out must be determined.
- this strategy might not suit all buying countries; it seems more suitable for multi-donor funds or major buying countries. The reason is that two-part pricing might need more elaborate negotiations on administrative procedures related to the timing and trigger of payments and also possibly a larger volume of transfers to make it worthwhile.
- it would only address the risk of overselling mitigation outcomes when the difference between the final selling price and the price received by the project developer was high enough to raise sufficient revenue to make up any shortfall between NDC targets and actual emissions during the NDC period. This would depend on the cost of alternative mitigation options domestically (which would, in all likelihood, be higher than those included in the original NDC package) and/or the price and availability of mitigation outcomes on the international market, which would also be highly uncertain.
- the marginal cost of NDC achievement must be established.

For this strategy to be implemented, a list of the mitigation measures required for NDC achievement must be available (based on the MACC, for which the mitigation potential and implementation cost of the measures in question must be determined).

Although there are no major impediments to its implementation in Chile, the use of this strategy on its own is not recommended, given its disadvantages, particularly the uncertainty about reducing the risk of overselling.

The table below summarises the advantages and disadvantages of the two strategies that involve providing a reserve fund.

Table 6: Comparison of strategies to provide a reserve fund

Advantages and disadvantages	Charging a levy on transfers to fund a mitigation outcome reserve or future ITMO purchases	Using higher pricing to reflect the opportunity cost
Advantages		
It is transparent for all those involved.	●	●
It enables resources to be generated to fund other higher-cost mitigation measures.	●	●
It would allow measures from all NDC sectors to be used for Article 6 cooperation.	●	●
Disadvantages		
It would only address the risk of overselling mitigation outcomes if the levy were high enough to raise sufficient revenue to make up for any shortfall between NDC targets and actual emissions during the NDC period.	●	●
It would potentially limit the host country's ability to transfer mitigation outcomes as prices would be less competitive.	●	
For this strategy to be implemented, the NDC mitigation analysis must be available and the specific abatement cost of the activity to be carried out must be determined.		●
The marginal cost of NDC achievement must be established.		●
It might require more elaborate negotiations on administrative procedures related to the timing and trigger of payments.		●

Source: Compiled by the authors

5.2. Determining strategies to avoid overselling mitigation outcomes in Chile

Broadly speaking, all the strategies described could be used in Chile if the requirements for their implementation were met and/or various considerations were taken into account to tailor them to the national context. There are, however, options in which the advantages outweigh the disadvantages in different scenarios, taking into account the availability of information and developments in the country in terms of governance, accounting, MRV and other aspects relating to Article 6 cooperation.

This section provides general guidelines for determining a type of strategy – a specific strategy or a combination of strategies – appropriate for the country in different cases, rather than one particular strategy to be implemented whatever the circumstances as there is no certainty about

what the future scenario will be. The requirements and relevant issues for the implementation of the different strategies are detailed in Section 6.

It is important to note that the three types of the strategy described above have different objectives, but they are often complementary. The first type of strategy, which excludes or includes certain mitigation measures (Section 5.1.1), aims to ensure that the measures included in the country's NDC package (and/or activities with the lowest abatement cost) are used by the host country and are not transferred to another country for use towards its NDC.

The second type of strategy, which involves sharing mitigation outcomes (Section 5.1.2), aims to ensure that the host country keeps part (or all) of the mitigation outcomes from a particular activity, while the rest are transferred internationally regardless of whether or not they are required for the achievement of the host country's NDC.

Lastly, the third type of strategy, which involves providing a reserve fund (Section 5.1.3), aims to generate resources to make up any shortfall by investing in additional mitigation measures domestically or by purchasing ITMOs when low-cost mitigation outcomes that could be used towards the host country's NDC are transferred to other countries (but sold at a price equal to or higher than the marginal cost of NDC achievement).

In general, the use of strategies to exclude or include mitigation measures requires more information because **it is necessary to identify and determine the NDC package**, that is, establish the measures that the country intends to implement to achieve its NDC, their mitigation potential and their implementation cost and time. Producing such information to implement this type of strategy is a challenge and a burden for the government but allows for better tracking of progress towards NDC achievement than strategies to share mitigation outcomes or provide a reserve fund, which do not, on their own, prevent the sale of mitigation outcomes required for the host country's NDC achievement.

One disadvantage of strategies to exclude or include mitigation measures is that they can potentially limit Article 6 cooperation on measures that, while required for NDC achievement, **could be implemented faster or better with funding from such cooperation**. This should not, however, be a problem with strategies to share mitigation outcomes or provide a reserve fund because they do not limit cooperation by type of measure and can therefore contribute to promoting the implementation of pioneering projects involving technologies required for NDC achievement.

As Chile has experience in analysing mitigation options for achieving the target of carbon neutrality by 2050, it could choose a strategy to exclude or include mitigation measures as its main strategy and complement this with other strategies. This **flexible strategy**, made up of the main strategy combined with complementary ones, such as sharing mitigation outcomes and/or providing a reserve fund, which would help avoid or lessen the potential limitations and disadvantages of the main strategy.

Under this approach, the main strategy would be responsible for keeping the bulk of the emission reductions required for NDC achievement in the country, while the complementary strategies would be used in specific situations where they would provide benefits. For example, if there were a measure that was not allowed for Article 6 cooperation under the main strategy, but could be implemented faster if its mitigation outcomes could be sold, an exception could be made for a limited number of projects for that measure to be implemented earlier than scheduled, using a strategy for limiting crediting periods or for the simple division of mitigation outcomes. The option of charging a levy on transfers could also be considered. More generally, the country could establish a strategy that allows mitigation outcomes from measures included in the NDC package to be sold for projects that would be carried out ahead of the implementation schedule specified in the NDC package.

The primary aim of all the strategies to exclude or include mitigation measures is to allow the country to reserve the mitigation outcomes with which it intends to achieve its NDC and sell only the emission reductions above the NDC targets. By combining a strategy of this type with complementary strategies, this criterion can be made more flexible, **permitting the sale of mitigation outcomes even from measures forming part of the NDC package, as a way of accelerating their implementation in the country**.

When deciding which exclusion or inclusion strategy to use as the main strategy, it is important to take into account the information available and weigh up the advantages and disadvantages of each one to choose the option that will best avoid the sale of mitigation outcomes required by the country for NDC achievement, but without limiting Article 6 cooperation unnecessarily.

Based on this analysis, the recommendation is to choose the main strategy with a similar approach to the one using baselines derived from NDC goals[17] when the required information is available. This strategy is less limiting than those that use a negative list, a positive list or an abatement cost threshold as it does not completely exclude the measures the country intends to implement to achieve its NDC (or those below a certain abatement cost threshold). It allows the sale of mitigation outcomes above the targets set for these measures, in addition to mitigation outcomes from measures not included in the NDC package. An option that is not mentioned in the study *Practical strategies to avoid overselling* [7], and that could be worth considering as a means of accelerating the introduction of new technologies, is carrying out this strategy in a way that incentivises pioneers to implement a technology, that is, by granting the right to sell surplus emission reductions from a particular measure to the projects that implemented the technology first.

The additional information required to implement a strategy using this approach (compared with other strategies to exclude or include mitigation measures) is annual targets and trajectories using measures that set the baseline. As mentioned above, Section 6 of this report provides more details about the requirements for the implementation of the different strategies.

If the information required to implement a strategy of the kind referred to above is not available, a positive list or negative list strategy is a good option. Although more restrictive than the strategy described above, it is simpler to implement as it requires less information and less sophisticated systems to track progress in implementing the measures, which lessens the burden for the government. This could be considered as a pilot stage and tried out on some specific projects that are not too big and do not require too great an effort in terms of MRV, to test the approaches 1) without compromising overall NDC achievement and 2) building the capacities and knowledge required to enable the country to implement the other two strategies that are less restrictive in terms of activities allowed for Article 6 cooperation. Charging a levy on transfers of mitigation outcomes is an option that can be used as a transparent mechanism to capture new resources to carry out pilots and, further down the line, to fund measures with a high implementation cost.

Another important factor to be taken into account is that the availability and level of detail of information on mitigation measures can vary from one sector to another and even from one measure to another within a sector. It is therefore necessary to analyse when each type of strategy can and should be used; the same strategy does not have to be used for all the sectors. For sectors where better information is available (annual targets and trajectories by measure, for example), the best option might be to implement the main strategy with an approach similar to the one that uses baselines derived from NDC goals, while for sectors where, for example, the

[17] Reference is made here to a 'strategy with a similar approach', rather than the strategy itself because the strategy, as it is described in Section 5.1.1.4, cannot be directly implemented in the country as Chile's NDC is not prepared in the right way for this. However, regardless of how the NDC is prepared, goals and trajectories can be set later and serve the same purpose.

only information available is a list of the measures that will allow them to meet their carbon budgets, it would be best to apply a more restrictive strategy, such as a negative or positive list, or if there is a high degree of uncertainty about their ability to meet targets, to bar them from Article 6 cooperation altogether. For example, if the waste sector mitigation plan identified a measure that would contribute to mitigation, but without providing any detailed information about when it could be implemented or the expected penetration rate, it could be excluded from Article 6 cooperation, to reserve these emission reductions for use towards Chile's NDC.

To sum up, of the strategies analysed, the recommended option is to establish the main strategy that excludes or includes measures, complemented by other strategies that make the main strategy more flexible, enabling mitigation outcomes from an excluded measure to be sold as a way of accelerating the implementation of this measure. Pilot projects help put strategies into practice so that capacities are developed, and lessons learned for scaling up. Different strategies can be chosen for each sector, depending on the information available for them. The figure below shows the main ideas discussed in this section.

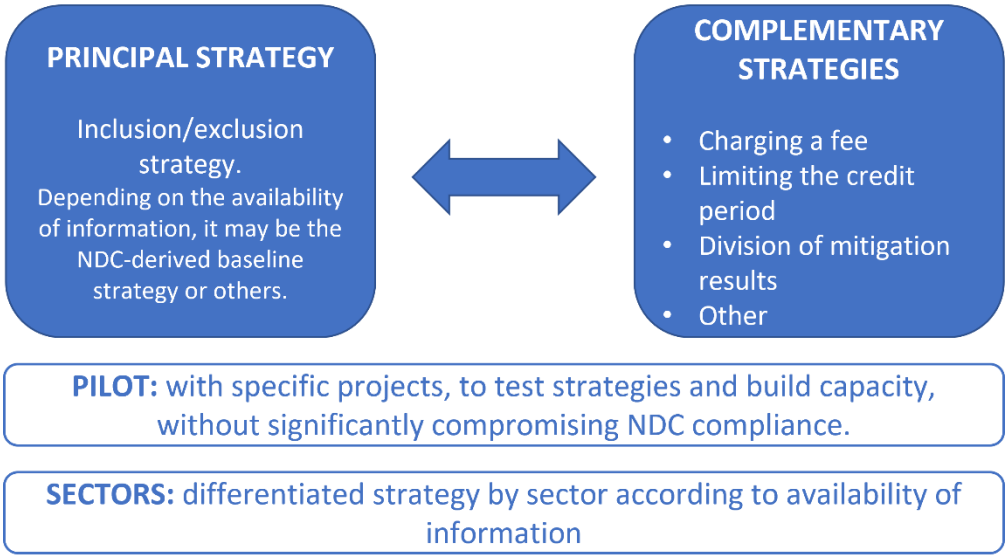


Figure 2: Strategies to avoid overselling mitigation outcomes in Chile

Source: Compiled by the authors

6. Gaps and recommendations for implementing strategies to avoid overselling mitigation outcomes in Chile

6.1. Readiness for Article 6 cooperation

This section sets out the main requirements and issues to be addressed to ensure the country's readiness to use Article 6 as a host country. They are important for demonstrating the achievement of NDC commitments, both for the host country and for UNFCCC compliance, and transparency and are international best practices. The issues addressed in this section are based on the report *Considerations for Article 6 Engagement: The host country perspective*, published by the German Environment Agency in 2020. [1]

6.1.1. National GHG Inventory

A national GHG inventory plays a key role in providing an understanding of the current status of a country's emitting sectors and identifying trends that can help develop baselines and track progress towards NDC achievement. The higher the quality and granularity of the inventory, the

more useful it will be not only for analysing the current situation, but also for projecting future trends, especially when the exercise is repeated over a number of years.

The preparation of a clear, robust, granular inventory covering all six Kyoto GHGs, prepared according to the IPCC's most recent guidelines, constitutes a central pillar of the transparency framework under Article 13 of the Paris Agreement, which is needed to track progress towards NDC achievement

Situation in Chile

Chile's current situation in relation to its inventories is clearly described in its fourth biennial update report (BUR) on climate change, published in 2020 by the Ministry of the Environment and used as a reference for this subsection.

As a developing country, Chile submits its National GHG Inventory to the UNFCCC as part of its national communications on climate change (submitted every four years) and BURs (submitted every two years since 2014).

Chile's National Greenhouse Gas Inventory System (SNICHILE) is responsible for preparing and coordinating the inventory and also for ensuring systematic and incremental advances in technical aspects, such as the continuous improvement in the quality of GHG estimates, the quality of the data used, research into country-specific emission factors for the main categories, quality control and assurance, the development of procedural manuals on cross-cutting issues (uncertainty, documentation and archiving, etc.) and building and maintaining the required technical capacities.

Estimates of Chile's GHGs and their precursors in its most recent National GHG Inventory (1990–2018 series), which quantifies emissions of the six Kyoto GHGs, were prepared according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories[18] and using the IPCC Inventory Software[19] for some categories, including analysis of the main categories, uncertainty assessments, completeness checks and recalculations. The National GHG Inventory was also prepared in compliance with the requirements set out in the UNFCCC biennial reporting guidelines for developed country Parties[20] and the Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention.[21]

Gaps and recommendations

In general, Chile has done a good job of preparing its inventories annually, submitting them to the UNFCCC (BUR and National Communications on Climate Change) and complying with the Paris Agreement requirements on inventories. It is therefore recommended that Chile continue this work and focus on systematically and incrementally improving the quality of the National GHG Inventory, as SNICHILE has been doing.

SNICHILE has developed a continuous improvement plan which identifies and prioritises opportunities for improving the National GHG Inventory. These include obtaining specific emission factors for the country's main fuels and incorporating agri-industry emissions in the 'manufacturing and construction industries' subcategory. Another aspect that warrants improvement is the disaggregation of information in the National Energy Balance for the subcategories 'other industries' and 'other mining', to provide more details about emissions in some sectors where Article 6 cooperation could be an option.

[18] Accessed at https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
[19] Tool available at https://www.ipcc-nggip.iges.or.jp/software/index.html
[20] Accessed at https://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf
[21] Accessed at https://unfccc.int/sites/default/files/resource/docs/cop8/07a02.pdf

6.1.2. NDC target setting and accounting

Another essential building block for engagement in Article 6 is clearly defined NDC targets that can be compared to inventory levels and accounted for. The variety of NDC formulations creates accounting difficulties for Article 6, especially if the countries wishing to cooperate have very different NDCs and/or metrics. Accounting for transfers across multiple NDCs presents a number of challenges, requires different assumptions that may or may not support climate change mitigation and entails risks for environmental integrity.

Moving towards economy-wide targets and global harmonisation of NDC formulations would greatly facilitate robust accounting and improve the functioning of Article 6. Any transfer might otherwise be limited to countries with compatible conditions in terms of NDC targets, inventories and MRV procedures. Such limitations may come from provisions adopted by the UNFCCC or through requirements from buying countries seeking to cooperate with countries that they consider having sufficiently similar targets.

Situation in Chile

As explained in Section 3.2, Chile sets clearly defined, economy-wide, quantified mitigation targets in its NDC, which can be easily measured against its inventory:

- emissions budget of 1,100 $MtCO_2e$ for the period from 2020 to 2030.
- emissions peak in 2025.
- emissions of 95 $MtCO_2e$ by 2030.

The current NDC has metrics that are different from those of the 2015 NDC and allow for more direct tracking against the National GHG Inventory. It includes an absolute emissions metric, the year when emissions should peak and a carbon budget. For more detailed information about Chile's NDC, see Section 3.2.

Gaps and recommendations

In this regard, Chile is well prepared for Article 6 cooperation. It is suggested, as it is for all parties, that Chile increase its mitigation ambition in its next NDC, taking into account progress made to date and both long-term country and Paris Agreement goals.

Section 6.3 provides recommendations on tracking progress towards meeting NDC commitments to ensure early data is available so that decisions can be taken if the country is not on track to achieve its NDC.

6.1.3. Long-term climate strategy

The Paris Agreement encourages countries to formulate and communicate long-term strategies in addition to their NDCs. For potential host countries seeking to transfer mitigation outcomes under Article 6, the development of a long-term climate strategy is important for charting sectoral pathways to decarbonisation and carbon neutrality. Such strategies have an important role to play in short-term policy and investment planning. They can also play a key role in determining the emitting sectors in which a country can address mitigation opportunities domestically in line with its NDC and in highlighting inaccessible sectors and technologies where countries could benefit from international support, for example, through Article 6 cooperation.

Situation in Chile

The Climate Change Bill provides for the creation of the country's Long-Term Climate Strategy (LTCS) which is 'the instrument that sets out the general long-term plans that the country will follow in a cross-cutting and integrated manner to achieve this purpose within 30 years'. It also specifies that the strategy must contain at least the following: national GHG emissions budget to

2030 and 2050; sectoral GHG emissions budgets to 2030; GHG removal levels; medium-term mitigation goals, targets and indicators; guidelines for cross-cutting adaptation measures to be implemented in the country; guidelines for ensuring that adaptation measures include nature-based solutions; guidelines on climate change risk assessment; mechanisms for the integration of national, sectoral and regional policies; and MRV criteria to track progress in implementing sectoral climate mitigation and adaptation plans.

Chile's proposed LTCS, which was at the public consultation stage[22] at the time of writing, does not explicitly specify what the role of Article 6 market mechanisms will be, but it does mention that the purpose of such mechanisms is to allow countries to implement mitigation activities cost-effectively and make progress in implementing new technologies through voluntary cooperation with other countries, for example, by transferring mitigation outcomes internationally.

A general recommendation drawn from the working sessions held to develop the LTCS was to make the strategy flexible so that it can incorporate new developments, such as international determinations relating to Article 6 of the Paris Agreement.

Gaps and recommendations

The development of an LTCS is a major advance for Chile in tackling climate change. The next step on the path to implementing a regulatory framework that promotes international cooperation is to establish what role international carbon markets and Article 6 of the Paris Agreement will play and incorporate this into the LTCS strategy or other related binding instruments. This framework must determine the criteria (sectors, technologies, crediting periods, etc.) and governance for carbon market participation and take into account any new determinations that emerge in the course of the negotiations.

It is recommended that the sectoral classification established in the Climate Change Bill,[23] which is based on the areas of responsibility of each ministry, also be used here. The proposed LTCS, still under public consultation at the time of writing, does, in fact, use the sectoral classification specified in the bill, which will be the starting point for developing sectoral mitigation plans.

6.1.4. Institutional framework for carbon markets and recording mitigation outcomes

Countries will need to establish some kind of institutional framework to oversee Article 6 activities. Previous experience with the CDM or other mechanisms may help form a basis for Article 6 readiness but this in itself will probably not be enough.

While the ability to trade mitigation outcomes gives countries more flexibility, it also adds an element of complexity to demonstrating NDC achievement, particularly for host countries. Countries engaging in Article 6 cooperation will require a more elaborate institutional framework and the ability to evaluate and approve or reject project, activity and sector proposals, operate a registry to keep track of transferred emission reductions and reconcile transfers with the inventory and NDC targets in order to demonstrate NDC achievement.

---

[22] A public consultation was held on the proposed LTCS from 27 May to 30 July 2021. Once observations from the consultation process have been incorporated, it will be approved by the President and then submitted to the UNFCCC at the COP26 summit in November 2021. The document under consultation can be viewed at: https://consultasciudadanas.mma.gob.cl/storage/consultation/oHhZIAWNi43KivqtamwTSF7FT7JDzlGeDgvOCPIQ.pdf (in Spanish).

[23] The text of the Draft Framework Law on Climate Change is available at: https://leycambioclimatico.cl/wp-content/uploads/2020/07/ProyectoLeyCC_13012020.pdf (in Spanish).

The use of Article 6 also requires authorisation from the participating countries. Their ability to evaluate and decide on project proposals and ensure robust accounting of ITMO transfers is therefore critical. A body similar to the CDM's DNA is required for this purpose and will be responsible for authorising activities. This authority needs to ensure that Article 6 cooperation is only used for mitigation opportunities that cannot be addressed domestically in order to avoid overselling mitigation outcomes and ensure NDC achievement, while also enabling future increases in ambition in subsequent NDC periods. This authority will have to safeguard the host country's ability to achieve its NDC and will play a much broader role than the DNA in the CDM.

Another important function of the institutional framework for Article 6 will be to manage, coordinate and organise the deliberations of a large number of stakeholders and government bodies responsible for different aspects of NDC achievement, such as determining measures, using Article 6, emission projections, tracking progress and MRV systems. This work will entail a considerable amount of coordination between the ministries and other entities involved.

Situation in Chile

Chile has previous experience in the CDM, where it set up a DNA to authorise participation in emission reduction initiatives under this mechanism. The role of this DNA is to examine applications for mitigation projects and authorise them, ensuring that they comply with environmental legislation.

The country has also acquired additional experience in international markets through participation in or association with Article 6 pilot initiatives and carbon clubs, as detailed in Section 3.4.

Various bodies at both the technical and policy level coordinate the different ministries, entities concerned with different aspects of the use of Article 6 and other stakeholders, including the Interministerial Task Force on Article 6, the Technical Interministerial Team for Climate Change, the Council of Ministers for Sustainability and the Advisory Environmental Council.

Gaps and recommendations

The current context is very different from the one in which Chile's DNA for the CDM was set up, where there was an emphasis on ensuring robust project-level accounting, compliance with environmental regulations and that additionality was a requirement. This meant that for a project to be accepted by the CDM, it had to demonstrate that the additional revenue that it would receive, if it was accepted, would make its implementation possible. The DNA's role was therefore confined to authorising projects, and there was no need for GHG inventory-linked accounting.

It is now necessary to continue building on existing governance capability to establish a DNA with greater responsibilities. This body will have to coordinate the country's efforts in mitigation accounting and emission projections at the national level and have the information required to take decisions on authorising projects applying to transfer mitigation outcomes internationally, based on the proposed strategies and progress and gaps in meeting mitigation commitments.

6.2. Determining the measures required for NDC achievement

The measures that the country needs to carry out to achieve its NDC must be identified and specified to implement a strategy to avoid overselling mitigation outcomes, as proposed in Section 0. The necessary precautions can then be taken to ensure that these mitigation outcomes are used to meet Chile's NDC targets and are not transferred internationally. If it is decided to transfer part of the mitigation outcomes, it must be ensured that this is only done to raise revenue to implement measures whose cost exceeds the marginal cost of NDC achievement.

The work involved in determining the measures needed for NDC achievement can be a significant burden for the government, requiring a detailed analysis of mitigation options specifying mitigation potential, cost, barriers to implementation, preparation of MACCs, etc. However, as mentioned

above, the strategies requiring such input offer substantial advantages over other types of strategy in terms of minimising the risk of overselling mitigation outcomes in a practical manner.

Another important point to note is that the more accurate and detailed the information on the selected measures is, the more effectively the strategy can be implemented to avoid the overselling of reductions without limiting the country's trading potential unnecessarily. For example, if the country only has a list of the measures required, only a positive or negative list strategy could be implemented. If, in addition, annual targets by measure are set, an approach similar to the one involving baselines derived from NDC goals, which is a less restrictive strategy, could also be used. If a detailed implementation schedule is also established, strategies to exclude or include activities could be complemented by strategies to share mitigation outcomes when mitigation initiatives are carried out ahead of the implementation schedule, to promote pioneering projects and allow the transfer of mitigation outcomes from measures not originally included in the NDC.

Situation in Chile

Chile has experience in the analysis of mitigation measures, including the preparation of MACCs, as evidenced by its NDC, which provides an evaluation of scenarios for achieving carbon neutrality by 2050. This analysis covers all the National GHG Inventory sectors and uses a methodology that includes modelling with a higher level of detail than the National GHG Inventory, a bottom-up approach for the energy sector and scenarios based on projections for relevant variables for other sectors.

The Climate Change Bill provides for sectoral mitigation plans to meet sectoral budgets. These plans describe 'the set of emission reduction activities and measures required to meet sectoral GHG emissions budgets established in the Long-Term Climate Strategy. These emissions budgets will be determined based on cost-effectiveness criteria. An MRV system is also established to track progress in implementing the measures and to ensure their effectiveness and transparency.'

The sectoral budgets that the bill requires to be prepared are 'the maximum amount of greenhouse gas emissions accumulated in a particular sector in a given period, representing the sum of total greenhouse gas emissions in each year in the corresponding period, as determined in the Long-Term Climate Strategy'. They will be linked to national budgets and the NDC.

Sectoral plans can therefore be expected to play an important role in determining the measures required for NDC achievement. If carried out correctly, the preparation of these plans, which entails a bottom-up approach – from measures to sectoral budgets, the national budget and NDC targets – promises to be an excellent alternative means of determining which measures should be allowed (or the extent to which they should be allowed) for Article 6 cooperation. If this approach is used to determine the measures needed for NDC achievement, the level of detail and completeness of the sectoral plans, which vary from one sector to another, will determine which strategy is the most suitable.

The proposed LTCS establishes sectoral mitigation goals and targets and will provide the basis for the subsequent development of sectoral plans.

Both the Climate Change Bill and the LTCS establish a sectoral classification based on the responsibilities of the ministries concerned with mitigating GHG emissions: Energy, Transport and Telecommunications, Mining, Health, Agriculture, Public Works, and Housing and Urban Planning.

Gaps and recommendations

It has not yet been fully determined how the sectoral plans will be structured or how the targets and measures will be expressed. It would be advisable to clearly establish the minimum

requirements so that a list of the measures required to meet sectoral budgets (and therefore the NDC in general) can be drawn up.

Sectoral ministries must, as a minimum, establish a list of measures that will enable them to meet their budget in the NDC period. Ideally, for the implementation of a strategy to avoid overselling mitigation outcomes, as proposed in Section 0, a detailed yearly implementation schedule should be prepared and annual targets set by measure for each sector.

A differentiated approach is recommended, under which a greater level of detail would be required from sectors that are better prepared in terms of technical capacities and financing and from those most prominent in the National GHG Inventory. The same strategy does not necessarily have to be applied to all sectors; the most suitable strategy should be chosen for each sector, depending on the quality and level of detail of the information available.

The information will be used to develop an NDC package with measures that can feasibly be implemented in each sector, with an implementation plan and an MRV system, in line with sectoral and national budgets. In this way, the NDC package will lessen the uncertainty about meeting the country's long-term commitments to carbon neutrality.

Based on this NDC package, the country can flesh out strategies to avoid or control the risk of overselling mitigation outcomes, establishing specific criteria by sector or technology.

6.3. Accounting and tracking progress towards NDC achievement

This section sets out the requirements and relevant issues for robust accounting of the mitigation outcomes generated and transferred by the country to track progress towards NDC achievement and facilitate efforts to lessen or control the potential risk of overselling mitigation outcomes. Robust accounting is needed for NDC monitoring in general, and for the use of ITMOs, to ensure NDC achievement.

6.3.1. Annually updated emission estimates

To periodically assess progress towards NDC achievement, it is essential to know the actual amount of emissions, ideally on a yearly basis. It is therefore necessary to obtain the most up-to-date information from databases of activities, measurements, estimates, projections, etc.

Situation in Chile

As mentioned above, Chile has a National GHG Inventory, which is published together with its BURs, with a two-year time lag.

The National Forecasting System (SNP) is currently being designed and implemented. It will lay the foundations for continuous analysis of past and projected emissions for tracking and planning purposes.

The SNP is intended as a tool that will evaluate prospective scenarios and GHG mitigation measures faster and easier. It will complement the specific analyses and forecasts of the different institutions involved (for example, the Ministry of Energy for the energy sector and the Ministry of Agriculture for the agriculture sector and other ministries).

To ensure the technical robustness of the SNP, the information, models and data used and generated must comply with the same standards of transparency, completeness, consistency, comparability and accuracy that are used to prepare the National GHG Inventory. [8]

Gaps and challenges

The SNP promises to be a valuable tool for generating updated information and projections for GHG emissions. It is recommended that the SNP develop, as one of its outputs, a 'dynamic inventory', with a simplified approach that is complemented by assumptions and/or projections, but that is nonetheless sufficiently robust to provide accurate emission estimates on a yearly basis. If it is determined that the country is not on track to meet the targets set annually or for longer periods (for example, five-year carbon budgets), these estimates will be checked against budgets or targets set annually in order to control the sale of mitigation outcomes and adjust mitigation measures, where necessary.

6.3.2. Setting annual targets, budgets and/or trajectories

If emission estimates are updated annually, it also makes sense to set annual targets, budgets and/or trajectories that will enable the country to achieve its NDC goal. This will allow the progress towards NDC achievement to be periodically assessed, by comparing budgeted emissions for a specific year with actual (or approximate) emissions in that year.

The choice of the approach for the application of corresponding adjustments is also important because it is necessary to evaluate how to complement the approach selected with the establishment of annual trajectories or budgets for the periodic assessment of progress towards NDC achievement.

Situation in Chile

In its NDC, Chile has committed to an emissions budget capped at 1,100 $MtCO_2e$ for the period from 2020 to 2030, with emissions peaking in 2025. This reflects a higher ambition than simply setting an emissions target for 2030 because the trajectory required to meet the target is specified.

The Climate Change Bill provides that national and sectoral emissions budgets will be prepared and specifies how they are linked to the NDC. They can therefore be expected to be structured in a way consistent with the targets set in order to meet the emissions budget and emissions peak commitments.

Gaps and challenges

Establishing an emissions budget is a significant advance in climate action and represents a higher ambition than simply setting a single-year target for emissions. Another sign of progress is that the Climate Change Bill provides for the development of sectoral budgets and plans. It is recommended that national and sectoral annual targets, trajectories and/or budgets be established to facilitate the tracking of progress towards NDC achievement on a yearly basis and avoid overselling mitigation outcomes, where possible.

When annual targets, trajectories and/or budgets are set, there may be inconsistencies with other important aspects of accounting or with NDC commitments. It is important to ensure that the targets set are consistent with the 1,100 $MtCO_2e$ budget for the period from 2020 to 2030 and with the emissions peak set for 2025 (or before). This should not pose any major difficulties.

Another issue that could gain prominence is the approach for applying corresponding adjustments. As mentioned in Section 3.3, Chile could choose one of two options: an annual trajectory or a rolling average. The option of ITMO transactions being accounted for in the final NDC target year (2030) would lead to greater uncertainty for the buyer. The annual trajectory approach is therefore recommended for the implementation of strategies to avoid overselling because it allows a year-by-year comparison of the emissions budget balance and actual emissions and transfers. This enables more effective tracking, unlike the rolling average approach, where the annual balance depends on what happens in the final target year.

If the annual trajectory approach is chosen, consistency must be ensured between the annual targets used for the trajectory and the annual targets, trajectories and budgets established to control the overselling of mitigation outcomes.

6.3.3. Measurement, reporting and verification

The challenge posed by GHG mitigation in Chile and in the rest of the world is not just achieving a reduction in emissions or an increase in removals, but also ensuring transparency and consistency in reporting on commitments. This focuses particular attention on the accounting rules used under international agreements before and after 2020 and the correct use and application of MRV systems for each country's mitigation activities. [8]

On this subject and in relation to the sectoral mitigation plans, the Climate Change Bill provides for 'a monitoring, reporting and verification system to accurately track progress in implementing the measures and ensure their effectiveness and transparency'.

Another important aspect of accounting and tracking progress towards NDC achievement is the use of centralised registries of mitigation measures and outcomes that bring together information from different sources, with a view to analysing progress towards NDC achievement in aggregate. It is therefore important to ensure that MRV systems are compatible with each other and comply with requirements for international transfers of mitigation outcomes when they are to be used for this purpose.

Situation in Chile

Chile has a variety of MRV systems applicable to different types of initiatives, some of them still at the early design stage. There follows a summary of some of the most important features of these systems, based on the information provided in Chile's fourth BUR.

- **MRV for the carbon tax:**
  - It applies to all entities subject to the green tax.
  - The Superintendency for the Environment (SMA) is responsible for developing and implementing this MRV system.
  - There is a system to register entities and their emission sources in the Single Window System for the Registry of Emissions and Transfer of Pollutants (VU-RETC).
  - It has instructions for quantifying emissions prepared by the SMA, setting out the various methodological options, which are divided into three main types: spot monitoring (sampling), continuous monitoring (continuous emission monitoring systems – CEMSs) and estimation (based on emission factors and activity data).
  - It has instructions for reporting emissions prepared by the SMA, which stipulate the administrative requirements for reporting the emissions data and background information needed to calculate the tax due. They also establish rules for sending individual reports to the National Energy Commission and the National Electricity Coordinator.
  - All entities subject to the tax are required to report to VU-RETC on a quarterly basis.
  - The verification process is stipulated in the instructions on verifying emissions implemented by the SMA, which establishes a set of activities and procedures aimed at checking that all the monitoring systems comply with the proposed quantification method submitted by the regulated entity and approved by resolution of the SMA. The verification process also involves establishing that the measurement and sampling methodologies are applied in compliance with the guidelines on reference methods and that the data reported are consistent with the operational data provided by entities.

  - Amendments made to Act 20,780 by Act 21,210 provide for mechanisms allowing for carbon offsets through payment of the green tax on emissions from 2023 onwards.
- **MRV for mitigation measures in the energy sector:**
  - The system monitors energy sector mitigation activities that contribute to achieving NDC commitments.
  - It will be linked to the national MRV system for mitigation measures to be developed by the Ministry of the Environment.
  - The Ministry of Energy has designed an online platform to register energy sector mitigation activities, with a view to creating a registry of mitigation measures.
  - With the approval of the tax reform (Act 21,210), work will continue, jointly with the Ministry of the Environment, to finalise this registry, with a view to creating a national, multisectoral registry for transparent and robust monitoring, which can be linked to the carbon tax offset scheme and international initiatives carried out under Article 6 of the Paris Agreement.
- **MRV for renewable energy projects:**
  - The system was developed as part of the assistance provided for the Nationally Appropriate Mitigation Action (NAMA) Expanding self-supply renewable energy systems, with the support of GIZ and in collaboration with the Ministry of Energy and the Ministry of the Environment.
  - Methodologies have been developed to estimate emission reductions from self-supply thermal and electric energy projects (solar thermal, photovoltaic, wind, hydroelectric, geothermal heat pumps, biogas and biomass, including cogeneration) and grid-connected renewable energy projects (solar photovoltaic, concentrated solar, wind and hydroelectric).
  - It is based on a bottom-up approach under which GHG emission reductions estimated independently by each project are recorded in the accounting system.
  - Calculation methodologies have been developed according to international standards, such as the World Resources Institute (WRI) Project Accounting Protocol for estimating GHG reductions, and the equations in Chapter 2 (stationary combustion) of the 2006 IPCC Guidelines.
  - Methodologies have been tailored to Chile's particular circumstances using information from the Ministry of Energy's Renewable Energy Explorers.[24]
- **MRV for *Comuna Energética*:**
  - The programme *Comuna Energética* seeks to contribute to improving energy management and to the involvement of municipal authorities and local players in developing and implementing replicable innovative sustainable energy initiatives in Chile's municipalities (*comunas*).
  - The MRV system for quantifying GHG emission reductions from the implementation of sustainable energy projects was created with a view to strengthening energy and climate-related action at the local level.
  - In general, the MRV system is concerned with defining aspects relating to institutional arrangements, coordination and human resources, addressing issues associated with double counting and the ownership of emission reductions and developing an MRV calculation tool.
- **Savings certificate for energy projects (CAPE):**
  - Certification is managed by the Energy Efficiency Agency.
  - It is based on the International Performance Measurement and Verification Protocol (IPMVP).
  - It seeks to facilitate reporting on energy and GHG mitigation outcomes from the implementation of energy projects aimed at reducing energy consumption.

[24] https://exploradores.minenergia.cl/

  - It is designed for companies, institutions and other bodies and organisations with energy projects on site so that they can demonstrate the actual reduction in consumption as a result of their implementation and the outcomes in terms of energy and emissions.
  - Certificates are also reported to the MRV administrator for energy sector mitigation measures.
  - Savings certificates are recognised by HuellaChile, the carbon management programme run by the Ministry of the Environment, as a valid basis for the award of its seal of recognition for GHG reduction.
- **MRV under the Pacific Alliance:**
  - Within the Pacific Alliance, made up of Chile, Colombia, Mexico and Peru, the Technical Subgroup on MRV (SGT-MRV) was formed with a view to strengthening and advancing the harmonisation and convergence of climate MRV systems for the reduction of GHG emissions and other pollutants. To this end, a series of specific outputs have been prepared, including baseline reports on MRV systems for mitigation measures and for climate finance.

An important step in the process of enhancing MRV systems, as highlighted in Chile's fourth BUR, is to develop an integrated platform for recording information on climate change as part of the project Capacity-Building Initiative for Transparency (CBIT) Chile. This will enable all the institutions directly or indirectly involved in promoting action to reduce emissions to easily identify such measures, quantify them and report on them to the Ministry of the Environment in a systematic manner.

The platform will be made up of different modules and structured in line with the systems currently managed by the Ministry of the Environment's Climate Change Office. One of these is SNICHILE, which contains the institutional, legal and procedural measures required for the biennial update of Chile's National GHG Inventory, which seeks to ensure sustainable inventory preparation, consistency in GHG reporting and the quality of results. Another of these systems is HuellaChile, which aims to promote effective GHG calculation, reporting and management in entities in the public and private sector.

In addition to these efforts, the country continues to work on developing MRV systems, with support from international organisations. For example, the preparation of guidelines for the national MRV system for mitigation policies and measures promoted by the public sector, which was commissioned by the United Nations Development Programme (UNDP), was under tender at the time of writing.

Gaps and recommendations

Chile has a wide variety of MRV systems, mainly associated with the energy sector, which is a very promising sign that there is capacity in this field. It is recommended that efforts to develop MRV systems be extended to other sectors, prioritising those featuring most prominently in the National GHG Inventory and sharing and capitalising on the expertise and experience gained in the energy sector.

Ensuring the coordination, consistency, and alignment of the different MRV systems is a major challenge that needs to be addressed so that the results of these systems can be used to facilitate the effective tracking of progress towards NDC achievement and the implementation of a strategy to avoid overselling mitigation outcomes. The integrated platform for recording information on climate change currently being developed under the CBIT Chile project is an initiative that promises to contribute significantly to meeting this challenge.

It is recommended that the DNA be entrusted with the task of developing protocols setting out requirements for developing MRV systems that are compatible and aligned with the platform so that new MRV systems can be linked to it from the start without any need for modifications.

7. Proposed action plan to avoid or control the risk of overselling mitigation outcomes in Chile

Recommendations on the way forward for Chile to meet mitigation commitments and reduce the risk of overselling mitigation outcomes can be drawn from the gap analysis in Chapter 6.

Based on these recommendations, Table 7 shows the steps proposed to address the issues analysed in the previous chapter.

Table 7: Steps to be taken to avoid or control the risk of overselling mitigation outcomes

Issue	Action	Contribution to avoiding overselling
READINESS FOR ARTICLE 6 COOPERATION		
National GHG Inventory	Continue efforts to increase the quality of the National GHG Inventory.	Contributes to maintaining sufficiently robust GHG accounting for Article 6 cooperation.
NDC target setting and accounting	Increase ambition for the preparation of the next NDC, taking into account progress made to date and long-term country and Paris Agreement goals.	Contributes to maintaining sufficiently robust GHG accounting for Article 6 cooperation.
LTCS	Determine the role of international carbon markets and Article 6 of the Paris Agreement and incorporate it into binding long-term instruments, establishing the criteria (sectors, technologies, crediting periods, etc.) and governance for participation in carbon markets and taking into account any new determinations that emerge in the course of the negotiations. The LTCS can play a key role in identifying the country's long-term mitigation priorities and the sectors and technologies requiring more support, for example, through Article 6 cooperation.	Helps establish the country's long-term mitigation priorities and could determine the role of carbon markets under Article 6.
Institutional framework for carbon markets and recording mitigation outcomes	Establish an institutional framework with a DNA. This authority will be responsible for coordinating the country's efforts in mitigation accounting, MRV and emission projections at the national level and for granting authorisation for emission reduction projects to transfer mitigation outcomes internationally, taking into account the proposed strategies, progress and gaps in meeting mitigation commitments.	Oversees and authorises Article 6 activities and transfers.

Issue	Action	Contribution to avoiding overselling
DETERMINING THE MEASURES REQUIRED FOR NDC ACHIEVEMENT		
Determining the NDC package	Determine requirements for sectors to establish the measures needed to meet the budget allocated to them,[25] first with a view to at least meeting their budget during the NDC period. As a second step, prepare a detailed annual implementation schedule and set annual targets by measure. The level of detail will vary, depending on the capacities of each sector.	The NDC package provides input for the development of the strategy to avoid overselling mitigation outcomes. It establishes the measures that will enable the country to achieve its NDC and a detailed implementation plan.
	Develop the NDC package with the measures that each sector will implement and quantify the annual *ex-ante* mitigation potential of each measure.	
Strategy implementation	Advance the implementation of strategies to avoid or control the risk of overselling mitigation outcomes, based on the NDC package, establishing specific criteria by sector or technology.	Contributes to controlling the risk of overselling.
Monitoring	Quantify the annual *ex-post* mitigation potential of each measure for robust and regular tracking of progress and gaps in meeting the country's commitments ('dynamic MACC') to ensure effective management and provide data to the DNA to inform decision-making on strategies to avoid or control the risk of overselling mitigation outcomes.	The measures implemented are monitored to assess progress and take corrective action, if necessary.
ACCOUNTING AND TRACKING PROGRESS TOWARDS NDC ACHIEVEMENT		
Annually updated emission estimates	Create a system for the development of a 'dynamic inventory' with a simpler approach to that required for reporting to the UNFCCC in order to have results more rapidly, with a view to establishing an online inventory system.	Allows the measures implemented to be monitored and their performance assessed. Provides updated information on progress towards NDC achievement.
Setting annual targets, budgets and/or trajectories	Set annual national and sectoral targets, budgets and/or trajectories to facilitate the annual tracking of progress towards NDC	Allows the measures implemented to be monitored and their performance

[25] The sectoral classification used is the same as the one established in the Draft Framework Law on Climate Change, which is based on the areas of responsibility of each ministry.

Issue	Action	Contribution to avoiding overselling
	achievement and avoid the overselling of mitigation outcomes. Draft guidelines on the use of the approach for applying corresponding adjustments based on annual trajectories.	assessed. Allows the NDC target to be broken down into annual and sectoral targets for more effective tracking of progress towards NDC achievement.
MRV	Develop protocols for MRV systems that are compatible and aligned with the central platform currently being developed (integrated platform for recording information on climate change under the CBIT Chile project).	Allows the measures implemented to be monitored and their performance assessed. Ensures robust accounting of mitigation outcomes.

Source: Compiled by the authors.

Based on the steps shown in the table above, an action plan is proposed, with a timescale that takes into account the feasibility of implementation based on the readiness required to carry out each step. The action plan comprises three phases: the first is a preliminary determination phase to lay the foundations for the infrastructure required for Article 6 cooperation; the second involves the implementation of Article 6 cooperation activities and the strategies to avoid overselling mitigation outcomes; and the third is an analysis and evaluation phase to assess the mitigation outcomes from the measures implemented and explore options for updating the NDC.

The figure below shows the steps proposed for each of the three phases.

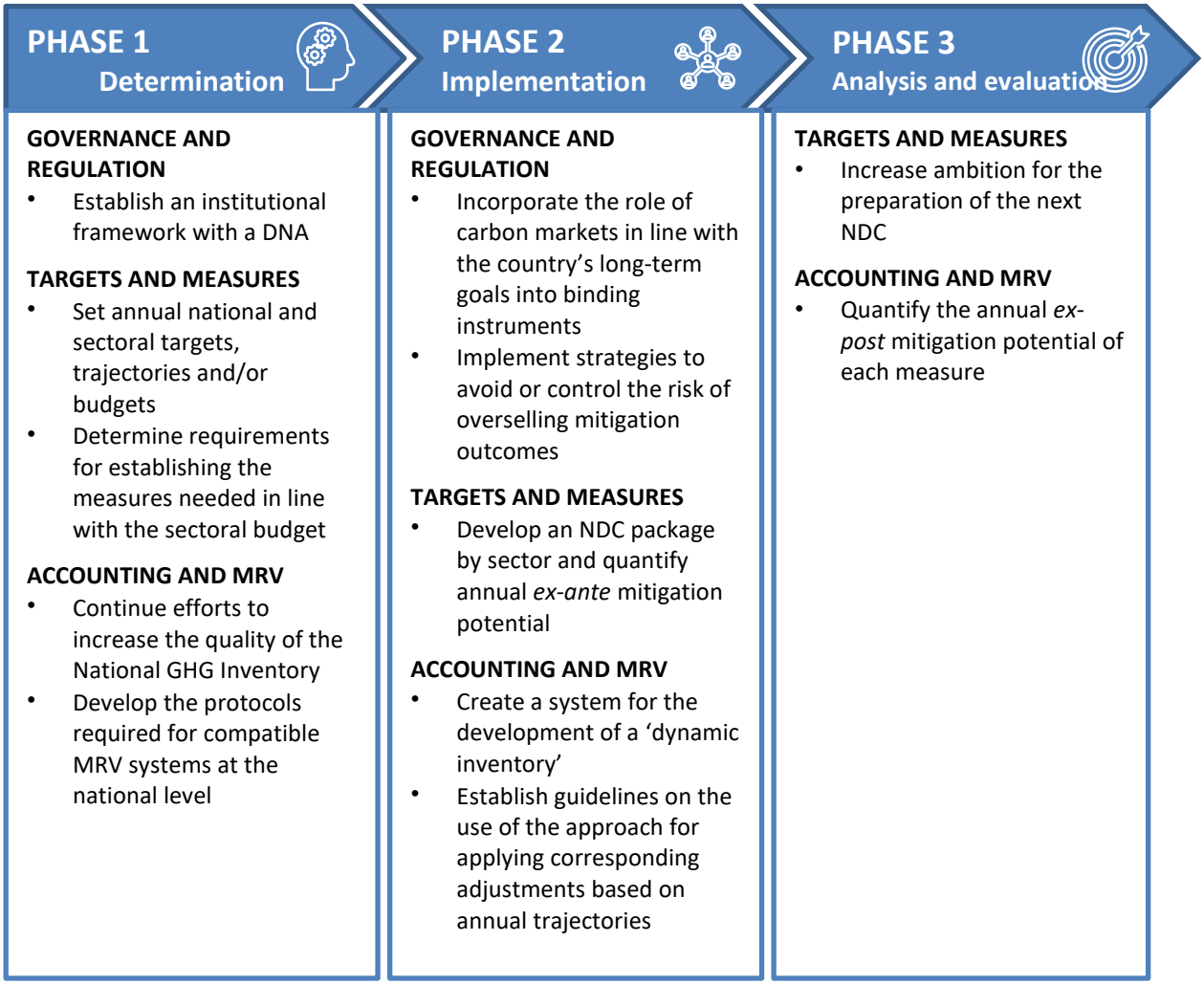


Figure 3: Action plan to avoid or control the risk of overselling mitigation outcomes

Source: Compiled by the authors

The suggested timescale for completing the three phases is as follows: one to two years for Phase 1; two years for Phase 2; and one year for Phase 3. However, the time it will take to implement the plan will also depend on the capacities available.

8. Conclusions and recommendations

This study analyses a number of different strategies to avoid or control the risk of overselling mitigation outcomes, taking into account the context in Chile. Based on this analysis, a flexible strategy is proposed, consisting of the main strategy that excludes or includes mitigation measures, complemented by strategies that share mitigation outcomes and/or provide a reserve fund, which will help overcome the potential limitations and disadvantages of the main strategy. While the primary aim of an exclusion/inclusion strategy is to make sure the country keeps the mitigation outcomes with which it intends to achieve its NDC and sells only the emission reductions above NDC targets, it can be made more flexible by combining it with complementary strategies that allow mitigation outcomes to be sold even when the measure is included in the NDC, as a way of accelerating its implementation in the host country.

The implementation of pilot projects is considered helpful in putting strategies into practice so that capacities can be developed, and lessons learned. It is also useful to consider strategies differentiated by sector,[26] which can subsequently be scaled up, depending on the information available.

Determining how to progress in meeting Chile's NDC goals will be reported, and which accounting approach will be used, particularly with regard to the type of corresponding adjustments to be applied, will be a crucial step in the process of establishing the details of the strategies to be implemented to avoid overselling.

It can be concluded from the analysis that Chile has made significant progress in improving its readiness for Article 6 cooperation. Efforts should now focus on establishing an institutional framework to govern the use of international carbon markets and on formally establishing the criteria under which Chile will participate in these markets.

Regarding the measures required for NDC achievement, it is proposed that an NDC package be developed containing the measures that each sector will implement. The annual *ex-ante* mitigation potential of each measure needs to be quantified, and periodic *ex-post* calculations will have to be made to track and manage the performance of the measures.

With regard to accounting and tracking progress towards NDC achievement, it is proposed that a system be set up to develop a 'dynamic inventory' and obtain simple data in a timely manner to inform decision-making and set annual national and sectoral targets, trajectories and/or budgets to facilitate the monitoring of progress towards meeting NDC goals on a yearly basis and avoid overselling mitigation outcomes.

Lastly, it is concluded that the country has made significant progress and has important initiatives under way that will contribute to its NDC achievement. It is recommended that Chile now proceed with the implementation of specific practical measures to strengthen the country's capacity to avoid or control the risk of overselling mitigation outcomes, as set out in the proposed action plan.

[26] Sectors are classified according to the areas of responsibility of the ministries concerned with mitigating GHG emissions, as established in the Draft Framework Law on Climate Change: Energy, Transport and Telecommunications, Mining, Health, Agriculture, Public Works, and Housing and Urban Planning.

9. Bibliography

[1] German Environment Agency, *Considerations for Article 6 engagement: The host country perspective*, 2020.

[2] World Bank, *State and Trends of Carbon Pricing 2020*, 2020.

[3] Asian Development Bank, *Decoding Article 6 of the Paris Agreement*, Version II, 2020.

[4] Government of Chile, *Chile's Nationally Determined Contribution: Update 2020*, 2020.

[5] Climate Focus/Perspectives, *Article 6 Corresponding Adjustments: Key accounting challenges for Article 6 transfers of mitigation outcomes*, 2019.

[6] Climate Finance Innovators, *Moving Towards Next Generation Carbon Markets*, 2019.

[7] Carbon Limits, *Practical strategies to avoid overselling*, 2020.

[8] Chilean Ministry of the Environment, *Cuarto Informe Bienal de Actualización de Chile sobre Cambio Climático*, 2020.

[9] Scientific Committee COP25 Chile, *Chilean NDC mitigation proposal: Methodological approach and supporting ambition*, 2019.

[10] Chilean Ministry of the Environment, *Propuesta Estrategia Climática de Largo Plazo*, 2021.

[11] Government of Chile, *Proyecto de Ley de Cambio Climático*, 2020.