INTEGRATION OF CLIMATE CHANGE IN CHILEAN PUBLIC INVESTMENT

Content

CHILE

Executive Summary integration of climate change in Chilean public investment

Chile has had a Social Cost of Carbon (SCC) since 2013, and is currently developing a stepped SCC estimation (increasing over time), the ECSE Software was also developed in 2018 to promote energy efficiency in public buildings, and there are sectoral methodologies (transport, hot water supply, and comprehensive household waste management) for the Social Evaluation of Projects that include the identification, quantification and valuation of Greenhouse Gas (GHG) impacts.

Global context of the country.

Chile is governed by *Organic Decree Law (1263) on Financial Administration of the State*[1] which, among other things, estates in Article 19bis: "Pre-investment studies and investment programs or projects should include, as an internal document of the Administration, a report from the national or regional planning agency, as the case may be, which must be substantiated on a technical-economic evaluation that analyzes its profitability. The Ministry of Finance shall be responsible for issuing instructions and resolving the matter". In 2019 the *Ministry of Social Development and Family* is created *by Law 20530*[2] , which mandates the ministry, among other functions, to evaluate the investment initiatives that request financing from the State.

The entities that make up the *National Public Administration* (NPA) have, among their powers: to identify, formulate and evaluate investment projects that are specific to their area, to keep the inventory of projects in the area updated, to carry out physical-financial control of the projects, to carry out ex-post evaluations and to exchange information with the Division of Social Evaluation Investment sand the Budget Directorate[3] .

In 2021, Chile issued the Long-Term Climate Strategy of Chile 2050[4] and as a result, in June 2022, the Framework Law on Climate Change-(Law 21455) [5] was published, which has as main objective "...to address the challenges presented by climate change, transition to low-emission development in greenhouse gases emissions and other climate forcers, until reaching and maintaining the greenhouse gas emissions neutrality by the year 2050..." and in its Article 2°.- Principles. Paragraph "b) Cost-effectiveness: climate change management will prioritize those measures that, being effective for mitigation and adaptation, represent the lowest economic, environmental and social costs, considering the indirect costs of inaction for adaptation" and in its article 53. "It is also responsibility of this Ministry to evaluate the investment initiatives that request financing from the State, to determine their social profitability, and to ensure the effectiveness and efficiency of the use of public funds and the reduction of the adverse effects of climate change, so that they respond to the strategies and policies of growth and economic and social development that are determined for the country."

[1] Organic Decree Law (1263) On the Financial Administration of the State
[2] Ministry of Social Development and Family (Law 20530)
[3] Chile's National Investment System | Regional Observatory of Planning for Development
[4] Chile's Long Term Climate Strategy 2050
[5] Framework Law on Climate Change (Law 21455).

The National Investment System (NIS) regulates and governs the public investment process in Chile through a set of guidelines, instructions, and methodologies.

The Ex-Ante Evaluation Subsystem provides public institutions with a set of guidelines, instructions, and procedures to develop a portfolio of socially profitable investment initiatives (SP) that can be allocated resources for execution[6] .

This is reflected in:

- Public investment Norms, Instructions and Procedures (NIP) (approved by the Ministry of Social Development and Family and the Ministry of Finance).
- Sectoral Information Requirements (SIR) that every investment projects must meet when applying for financing through the NIS.
- General and sector-specific social formulation and evaluation methodologies.
- Current Social Prices.

As a result of the update of the Nationally Determined Contribution reduction targets, the SCP was updated based on the emissions abatement costs. A first phase of consulting with ECLAC is underway to achieve a phased SCP for the achievement of long-term goals, with an estimated conclusion in 2023.

Description of the experience.

The incorporation of climate change into public investment is based on four (4) pillars:

- Mitigation of greenhouse gases (GHG) that can absorb infrared radiation, trapping heat in the atmosphere. This is due to human activity causing global warming.
- Adaptation CC and DRR, reducing vulnerability, strengthening resilience, and increasing the country's adaptive capacity, especially by increasing water security and considering nature-based solutions.
- Mitigation of Black Carbon (BC) Best known and mentioned are PM2.5 and PM10 which are regulated in the primary standard and in the decontamination plans.
- Integration, Circular economy, land use and forestry, ecosystems (restoration, protection)

Sectoral methodologies incorporating climate change in public investment.

The Chilean National Investment System incorporates the quantification of externalities associated with GHGs through of social evaluation methodologies for projects in different sectors, including:

- Methodology for the formulation and social evaluation of projects for the management or handling of household solid waste (MISW)[7] , which is regulated through the Sectoral Information Requirement for investment project applications (SIR).

[6] https://cambioclimatico.mma.gob.cl/wp-content/uploads/2021/08/210729_Presentacio%CC%81n-SNI-y-CC_ETICC.pdf
[7] https://sni.gob.cl/storage/docs/220818_Metodologia_GIRS_vf.pdf

- Methodological instructions for the incorporation of pollutant emissions in the social evaluation of urban road transport projects.[8]
- Methodology for the formulation and social evaluation of projects for the provision of hot water for sanitary use (WSU) in public facilities[9] ,
- Methodology for the formulation and social evaluation of projects for the provision of Hot water for sanitary use in households.[10] ,
- Manual and Software for Social Costs and Efficiency in Buildings (SCE), which is regulated through the Sectoral Information Requirement for investment projects applications (RIS) in public building projects, improvement, or capacity expansion.
- Methodology for the evaluation of investment portfolios for the "Recuperación de Barrios" program (I want my neighborhood Back)[11] .

Additionally, the general methodology for project preparation and evaluation includes the explicit valuation of GHG impacts in the project's socio-economic evaluation.

However, at present, the SNIP does not regulate the formulation of projects with CCA plans. Nevertheless, the system is in the process of developing methodologies for including CCA plan through investment portfolios.

History of the Social Price of Carbon (SPC) in Chile's National Investment System (NIS)

- In 2011, the Ministry of Social Development estimated the CSP of 4.05 USD per ton of CO2 for the Clean Development Mechanism (CDM).
- In 2015, a study on the Evaluation of the Social Profitability of the Incorporation of Energy Efficiency in Public Buildings was completed, which led to the development of a tool and Software the ECSE for estimating the SPC.
- In 2016, SPC is updated, raising it to 8.45 USD per ton of CO2.
- In 2017, with the support of the British Embassy in Chile, a study was conducted to estimate the SPC using the UK model to derive a shadow carbon price based on Chile's emissions reduction goals under the Paris Agreement. The study produced an CSP range of 20 to 43 USD/tCO2, with a mean of value of 32.5 USD/tCO2.
- From 2018 to 2021, Chile's experience was shared, and a methodological strategy for estimating the SPC was documented. [12] Studies were conducted on the simulation of SPC in energy, infrastructure and urban mobility, and a compendium of legal barriers to SPC in public investment was compiled.
- The applications made in the study concluded that having a social price of carbon enables the estimation of changes in CO2 emissions in public building, roads, airports, rural water supply, freight, and passenger rail projects, among others.[13]
- According to the 5th Biennial Update Report to the United Nations Framework Convention on Climate Change[14] , the updating of the Social Price of Carbon (SPC) is part of the update of the Nationally Determined Contribution (NDC), which could help to

[8] https://sni.gob.cl/storage/docs/220309_instructivo_metodologico_emisiones.pdf
[9] http://sni.gob.cl/storage/docs/Metodologia_ACS_Establec_publico_2022.pdf
[10] http://sni.gob.cl/storage/docs/Metodologia_ACS_Hogares_2022.pdf
[11] https://sni.gob.cl/storage/docs/Metodologia_PQMB_20221221.pdf
[12] https://www.cepal.org/es/publicaciones/46957-metodologia-la-estimacion-precio-social-carbono-chile-paises-america-latina
[13] Ministry of Social Development and Family (MDSF, Chile)
[14] https://unfccc.int/sites/default/files/resource/Informe_5IBA_2022_Final.pdf

transform Chile into a low carbon economy. In light of this new challenge, DESI-MIDESO proposed to update the SPC based on the NDC updated in 2020. To achieve this, DESI-MIDESO is working with the Ministry of Energy, Ministry of Environment, Ministry of Finance and the Economic Commission for Latin America and the Caribbean (ECLAC), to reach a consensus on the estimation, and encourage its use in the social evaluation of public investment projects.

- In 2021 MIDESO requested support from the Euroclima+ Program, through ECLAC, to conduct a complementary study to update the Social Price of Carbon (SPC), considering some of the highlighted discussions, (1) such as transforming market prices of Long Term Energy Planning (LTEP) initiatives into social prices, (2) determining the appropriateness of using an intergenerational social discount rate to estimation the SPC, considering the long term effects of climate change, and (3) SPC evaluation horizon. The new estimation of the SPC for implementation in the social evaluation of public infrastructure projects entering the National Investment System is projected for the first half of 2023.[15]

Age of implementation.

In terms of methodology, since 2011 the social price of carbon has been published and since 2018 it has been used in estimating externalities in public building projects, supported by the ECSE Software for measuring of energy efficiency measures.

Advances in Climate Change Mitigation in Public Investment in Chile

- In 2015, the study on the Social Profitability Evaluation of Energy Efficiency Incorporation in Public Buildings was completed. A tool was developed for its estimation.
- In 2017, the Methodology for formulating and evaluating interurban transport projects was developed. It incorporates benefits from reducing the impact on global warming (CO2).
- In 2018, the RIS for the application of energy efficiency analysis in public buildings in Chile were formalized.
- In 2019, the Methodology for the preparation and social evaluation of domestic hot water and public building projects and the Zero Emissions National Stadium Project will be developed.
- In 2022, the Integrated Methodology for Domestic and Assimilable Waste and the Investment Portfolio Methodology of the "Quiero mi Barrio" Program were published.

The greatest impact of the Social Price of Carbon (SPC) in the field of climate change mitigation is its complementary use with the ECSE (Efficiency and Social Costs in Buildings) tool for the social evaluation of energy efficiency measures (passive and active), for projects in the profile stage.[16]

[15] Idem
[16] Extracted from interview with Ms. Orietta Valdes of the Ministry of Social Development and Family, Chile. Orietta Valdes of the Ministry of Social Development and Family, Chile.

From the implementation mentioned above, the following experiences stand out:

The construction of the Regional Secretariats of the Ministry of Public Works, the Rucamanke Educational Complex, the Atacama Desert Airport, the Teniente Merino School in Cochrane, Gabriela Mistral School in Aysén, and the buildings for the judiciary are among the most prominent.[17]

In detail, the implementation of this tool, for example, in a police barracks construction project, evaluated two alternative solutions, one of which incorporated energy efficiency measures such as air conditioning equipment, LED lighting, among others, which reduced the Present Value of Costs (PVC) by 17%.[18]

Application examples.

A successful example of socioeconomic evaluation in the environment and natural resources sector was reviewed, specifically an urban solid waste management project that includes the valuation of externalities due to Greenhouse Gas emissions, which was developed in 2022.

The methodology for integrating climate change considerations into public investment projects is carried out in three steps:

- Step 1 considered the identification of the potential Greenhouse Gas (GHG) emissions sources from the problem tree analysis.
- Step 2 In the evaluation of alternatives, the entire service provision cycle is analyzed to quantify detailed greenhouse gas emissions for both current and proposed alternatives. The annualized tCO2 e emissions are projected over the evaluation horizon.
- Step 3 The quantification step, estimates the differential emissions of greenhouse gases in the current situation compared to the situation with the proposed project, resulting in the avoided greenhouse gas emissions. The avoided emissions can be monetized using the SPC, which translates into a social benefit of reduced greenhouse gas emissions.
- Finally, the savings from avoided greenhouse gas emissions are incorporated into the benefit streams of the evaluated alternatives by multiplying the net amount of tCO2e not emitted by the Chilean SPC (25,506 Chilean Pesos as of December 2022).

Systematic applicability.

It is worth noting that while there is currently no obligation to apply the methodologies that consider the estimation of GHG impacts in the evaluation of public investment projects, it is work in progress and its development is planned for 2023; the vision is to incorporate it into all sectors.

[17] Idem
[18] Idem

Main results/findings/recommendations.

An important step will be the development of technical procedures and tools for the identification and quantification of GHG emissions at the investment project level in a generalized manner.

In light of this, the country must advance in updating the regulatory framework for the widespread inclusion of the valuation of externalities (GHG impacts) within the socioeconomic evaluation of public investment projects. This will ensure systematic applicability and enable sound investment decisions that consider the environmental impacts of the project.