

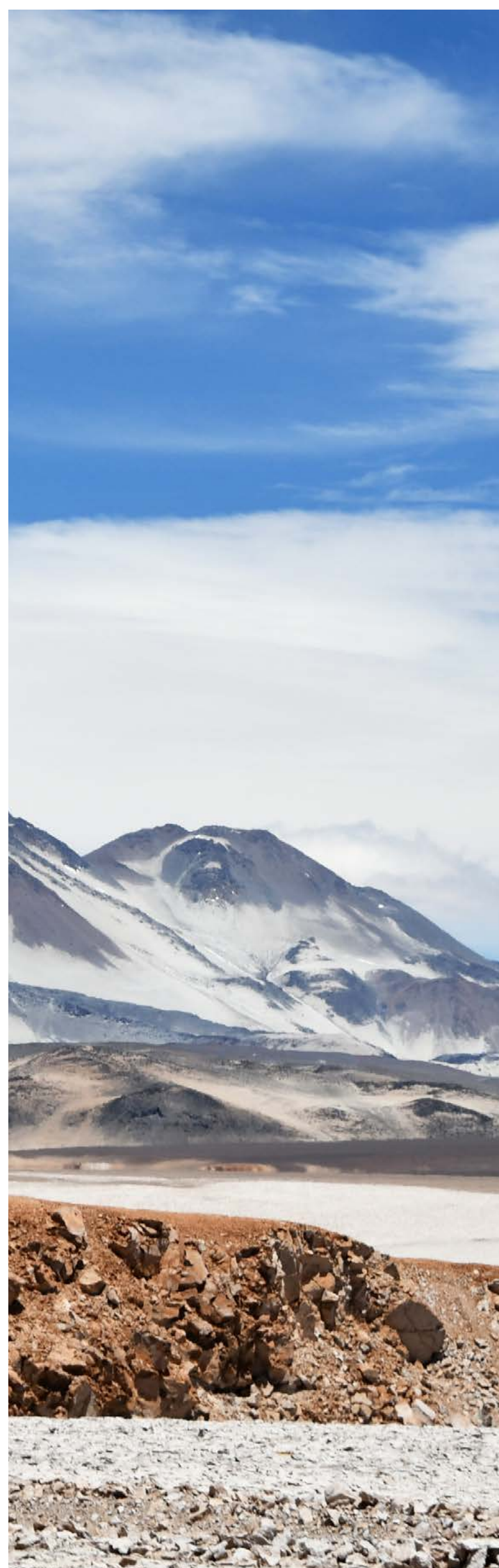


Executive Summary

5th Biennial Update Report under the United Nations Framework Convention on Climate Change



Executive Summary



Cover photo by: Tomás Gomez

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1. National Circumstances

1.1. National Profile

1.1.1. Physical context

Chile is a tri-continental country located at the western and southern most extreme of South America. It includes Easter Island in Oceania and extends to Antarctica in the South. Additionally, the Juan Fernández archipelago, as well as the islands of Salas y Gómez, San Félix and San Ambrosio make up its national territory. It has a total surface area of 2,006,096 km², without considering the maritime territory (territorial sea, Exclusive Economic Zone (ZEE) and continental platform), which is distributed over 755,932 km² corresponding to South America, 1,250,000 km² to Antarctica, and 163 km² to Oceania. Chile's northern border is with Peru. Its eastern border is with both Bolivia and Argentina. To the South, Chile's border is with the South Pole and its western border is the Pacific Ocean.

The landscape of the country, in the South American territory, is mainly determined by these three morphological units: the Andes Mountain range to the east; the Coastal Mountain range to the west; and an intermediate depression located between the two mountain systems.

Chile has a multiplicity of climates that are produced fundamentally by its latitude and altitude. These characteristics give origin to four macro-bioclimate: tropical, mediterranean, temperate and anti-boreal, within which 125 terrestrial ecosystems (vegetation floors) and 96 marine ecosystems are distributed along the Chilean coast.

Due to Chile's bioclimatic and geomorphological conditions, a large part of the national population is established in the intermediate depression of the central zone, which has determined the land use patterns observed in the country in 2020: pastures (40%), other lands (28%), forest lands (24%), croplands (4%), wetlands (3%), settlements (1%).

1.1.2. Environmental status

The *Sixth Report on the Environment Status*, published in 2021 by the Ministry of the Environment, provides an update of about 160 environmental indicators and statistics for the country, highlighting the following points:

- Three major sources of air pollution are recognized: means of transportation, industrial activities, and heating homes with wood combustion. To counteract this, various actions have continued to be implemented to improve air quality, such as: new atmospheric prevention and/or decontamination plans and health alerts; regulations applied to the public and private transportation system; work with communities to improve energy efficiency in homes, among others.
- In relation to biodiversity: **(1)** there is a greater reduction in the surface area of ecosystems in the central zone of Chile, specifically on the coast and in the central area (see Figure 3 of Chapter 1); **(2)** as of 2020, there are 1,340 species classified according to their conservation status (see Figure 4 of Chapter 1); **(3)** as of December 2020, the surface area of protected areas is greater than 164,863 km²,

which means that 21.8% of the national territory has some of the protection designations considered in the National Register of Protected Areas.

- The factors that have increased the drought that Chile has been experiencing for more than a decade are changes in precipitation patterns, reduced snow accumulation and high temperatures. Environmental efforts on water resources include legislative reforms, defining priority uses and improvements in groundwater management, as well as the creation of policies that contribute to the conservation of water bodies, such as the National Wetlands Protection Plan and the Urban Wetlands Law.
- Regarding the oceans, today they receive the waste that is carried by precipitation or bodies of water and, consequently, marine ecosystems and their biodiversity have suffered continuous deterioration due to the pollution and acidification of coastal and marine waters. Thermoelectric power plants are the main source of emissions of oils and greases, heavy metals, hydrocarbons, sulfates, and sulfur.
- In relation to waste generation, it is estimated that during the year 2020 in Chile about 20 million tons of waste were generated. The State is promoting a series of instruments that go hand in hand with the implementation of the Law for Promotion of Recycling (REP), which gives powers to the Ministry of the Environment to regulate the prevention of waste generation and encourages its use as a resource. In 2021,

the Circular Economy Roadmap was published, a long-term planning instrument to move towards a circular economy, in which the current production and consumption model is rethought.

- There is an unfavorable gap for women in access to and ownership of natural resources, which also affects their access to food and livelihoods. The land tenure gap is 32% and the water rights gap is 17%, reflecting the vulnerability of women, especially in rural areas, facing extreme events, such as droughts caused by climate change, natural or anthropogenic disasters.

1.1.3. Social context

According to the 2017 census, the country has a total population of 17,574,003. In the last decades, the country has experienced a significant migratory flow. In 2020, the foreign population residing in Chile reached 1,462,103 people (National Institute of Statistics, INE, 2021), 0.8% more than in 2019. Most of the international migrants living in the country come from Venezuela, Peru, Haiti, Colombia, and Bolivia. Over the years, the population has aged, which can be seen in the changes in the distribution of age groups: there is a decrease in the number of people aged 0-14 years and an increase in the number of people aged 65 years and older.

Chile maintains the first place in the Human Development Index in Latin America in 2020, and 43rd place among 189 countries, which places the country in the "very high" human development category. In contrast, when the index is adjusted

for the country's inequalities, Chile falls 11 places in the world ranking. As for income poverty, in 2017 this situation affected 8.6% of people, a figure significantly lower than that recorded for 2006, when the population in poverty reached 29.1%. In 2020, the income poverty rate increased by 2.2 percentage points compared to 2017.

The health crisis is still ongoing almost two years after the appearance of the first case of COVID-19 in Latin America and the Caribbean in February 2020. The extension of the pandemic is correlated with the persistence of the social crisis, with a deterioration in dimensions central to social development and people's health, such as poverty and extreme poverty, inequality, unemployment, and lack of access to education and care. In this context, it has been identified that COVID-19 negatively affected female labor participation in Chile. This idea is reinforced by observing the rates of recovery in labor participation according to sex, since the consequences of the COVID-19 pandemic seem to be projected differently in men and women. To face the great environmental challenges facing Chile and the world, it is necessary to strengthen women's empowerment, improving institutions and laws in terms of gender equity, and implementing programs that promote, encourage and facilitate the involvement of women in positions of power. Gender and environmental approaches are essential for sustainable, equitable and fair management of natural resources and ecosystems.

Given the current scenario in the social context, we are facing a historic opportunity to restructure the various systems towards universal, quality cove-

rage for the entire population, complemented by the prioritization of redistributive and solidarity-based policies with a rights-based approach; universal, comprehensive and sustainable social protection systems within the framework of care societies; the strengthening of institutions and public-private alliances aimed at sustainable industrial and technological policies; and the consolidation of a social pact centered on rights and equality.

1.1.4. Economic profile

From the perspective of origin, for 2020, slight increases were observed in most activities, with personal services and business services making the greatest contribution to the GDP result. Meanwhile, the main negative incidences evidenced by the COVID-19 pandemic contingency are related to construction, restaurants and hotels, and transportation. More details of GDP from 2013 to 2020 are presented in Table 4 of Chapter 1.

1.2. Institutional arrangements for Climate Change

1.2.1. Framework Law on Climate Change

On June 13, 2022, the Framework Law on Climate Change (LMCC) was published in the Official Chilean Newspaper, which creates a legal framework for the country to face climate change in terms of mitigation and adaptation in a longterm perspective and thus comply with its international commitments assumed before the UNFCCC and the Paris Agreement. This law was enacted on May 30, 2022, by the President of the Republic Gabriel Boric, and 15 ministries: Environment; Interior and Public Safety; Foreign

Affairs; Defense; Finance; Economy; Education; Public Works; Health; Housing and Urban Planning; Agriculture; Mining; Transportation and Communications; Energy; and Science, Technology, Innovation and Knowledge.

The Law establishes as a national goal to make the country carbon neutral by 2050 at the latest and to reduce vulnerability and increase the country's resilience to the adverse effects of climate change.

Law 21,455 seeks to strengthen the institutional framework to address the challenges posed by climate change by establishing principles, institutional framework, management instruments and financing mechanisms, as well as establishing processes for citizen participation during the preparation of climate change management instruments (see Figure 3 in Chapter 3).

1.2.2. Instrument for climate change management

Nationally Determined Contribution

The Nationally Determined Contribution (NDC) is the instrument that contains Chile's commitments to the international community to mitigate greenhouse gas emissions and implement adaptation measures, in accordance with the provisions of the Paris Agreement.

The structure of the NDC, submitted in April 2020 to the UNFCCC, considers a social pillar of just transition and sustainable development and the components of mitigation, adaptation, integration and means of implementation (capacity building, technology transfer and finance). The incorporation

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of the social pillar of just transition and sustainable development objectives translates into formulation criteria for updating and implementing the NDC. The measures contained in the NDC should consider variables such as synergy with the Sustainable Development Goals (SDGs), just transition, water security, nature-based solutions (NBS), gender equity and equality, cost-efficiency, consideration of types of knowledge and participation, aiming to safeguard the rights of the most vulnerable (MMA, 2020).

Long-Term Climate Strategy

It is an instrument that defines the long-term guidelines that the country will follow in a cross-cutting and integrated manner, considering a 30-year horizon. If the objective is to be carbon neutral and climate resilient by 2050 at the latest, the Long-Term Climate Strategy (ECLP) is the roadmap that contains the goals that will allow achieving the main objective, i.e., it defines how to achieve the objectives established in the NDC. The ECLP must be fully updated every ten years and in an abbreviated form every five years to incorporate the new NDC.

The ECLP was submitted to the UNFCCC in November 2021 and contains the definition of a national greenhouse gas emissions budget for 2030 and 2050 and sectoral mitigation targets (emission budgets for each of the sectors). It also presents sectoral adaptation goals and guidelines at the national, sectoral, regional, and communal levels.

Sectoral Mitigation Plans

Law 21,455 establishes that the Sectoral Mitigation Plans will include actions and measures aimed at

reducing or absorbing greenhouse gasses, in line with the emission budgets assigned to each sector in the ECLP. These plans must be prepared by the following ministries: Energy; Transportation and Communications; Mining; Health; Agriculture; Public Works; and Housing and Urban Planning. These plans will be reviewed and updated, where appropriate, at least every five years.

Sectoral Adaptation Plans

It is defined that the Sectoral Adaptation Plans will establish all the actions and measures so that the most vulnerable sectors can adapt to climate change and increase their resilience. Eleven ministries are established to prepare such plans: Biodiversity (Environment), Water Resources (Public Works), Infrastructure (Public Works), Health (Health), Mining (Mining), Energy (Energy), Forestry and Livestock (Agriculture), Fishing and Aquaculture (Economy), Cities (Housing and Urban Planning), Tourism (Economy), Coastal Zone (Defense and Transportation). These plans will be reviewed and updated every five years. It is worth mentioning that there are plans since 2013: Forestry and Livestock (2013), Biodiversity (2014), Health (2015), Fishing and aquaculture (2016), Infrastructure (2017), Energy (2018), Cities (2018) and Tourism (2019).

Regional Action Plans

Their purpose will be to define the objectives and instruments for climate change management at the regional and communal level, which must be adjusted and consistent with the guidelines of the ECLP, the Sectoral Mitigation and Adaptation Plans, the Communal Action Plans, as well as the Strategic Plans for Water Resources of Basins when

they exist. They will be elaborated by the Regional Climate Change Committees and the maximum term for their elaboration is three years from the date of promulgation of the Long-Term Climate Strategy.

Communal Action Plans

They must be consistent with the general guidelines established in the Long-Term Climate Strategy and in the Regional Climate Change Action Plans. They will be prepared by the municipalities and the maximum term for their preparation is three years from the date of enactment of the Framework Law on Climate Change.

Strategic Plans for Water Resources in Basins

The purpose of these instruments is to contribute to water management, identify water gaps in surface and groundwater, establish the water balance and its projections, diagnose the state of information on quantity, quality, infrastructure, and institutions involved in the decision-making process regarding water resources, and propose a set of actions to face the adverse effects of climate change on water resources to safeguard water security. The Ministry of Public Works oversees the preparation of these plans together with the Ministry of the Environment; the Ministry of Agriculture; the Ministry of Science, Technology, Knowledge, and Innovation; the Ministry of Foreign Affairs when it corresponds to transboundary basins; and the respective Regional Climate Change Committees (CORECC). Each basin in the country must have a Strategic Water Resources Plan, which will be public and must be reviewed every five years and updated every ten years.

1.2.3. Environmental and climate change institutional framework

1.2.3.1. Climate Change Division of the Ministry of the Environment

In 2010, the Climate Change Office was created, which reports directly to the Undersecretariat of the Environment and was in operation until June 2022. With the enactment of the Framework Law on Climate Change, the Climate Change Division was created through Resolution MMA No. 664 of June 12, 2022, with four departments: Climate Mitigation and Transparency; Climate Change Adaptation; Climate Finance and Means of Implementation; and Ozone.

1.2.3.2. Sectoral authorities

The sectoral authorities on climate change are those that have competence in sectors that represent the highest greenhouse gas emissions or the greatest vulnerability to climate change in the country. These correspond to the ten ministries with obligations to prepare sectoral mitigation and/or adaptation plans: Agriculture; Economy, Development and Tourism; Energy; Mining; Public Works; Health; Transport and Communications; National Defense; Housing and Urban Planning; and Environment.

To incorporate the gender perspective and vulnerable groups in the preparation of the above-mentioned plans, the sectoral authorities should collaborate with the relevant agencies, especially with the Ministry of Women and Gender Equity and the Ministry of Social Development and Family. The Ministries of Education and Science also have several responsibilities in terms of scientific

information, capacity building, development and transfer of technologies, definition of the functioning and rules for the formation of the Scientific Advisory Committee for Climate Change, and support for the implementation of a National System for Access to Information and Citizen Participation on Climate Change.

1.2.3.3 Collaborating organizations **Council of Ministers for Sustainability and Climate Change (CMSyCC)**

Law 19,300 was amended by the Framework Law on Climate Change, the Council of Ministers for Sustainability (CMS), by the Council of Ministers for Sustainability and Climate Change (CMSyCC), which is chaired by the Minister of the Environment and composed of his or her peers from Agriculture; Finance; Health; Economy, Development and Tourism; Energy; Public Works; Housing and Urban Planning; Transportation and Communications; Mining; Social Development; Education; and Science, Technology, Knowledge and Innovation.

This council will be responsible for issuing a well-founded statement on the Long-Term Climate Strategy, the Nationally Determined Contribution and the Sectoral Mitigation and Adaptation Plans, as well as on the coherence between them, in accordance with the provisions of the law.

Scientific Advisory Committee on Climate Change

It is a committee that advises the Ministry of the Environment on the scientific aspects required, among others, for the elaboration, design, implementation and updating of climate change management instruments.

National Council for Sustainability and Climate Change

Initially, the body was called the National Advisory Council of the Ministry of the Environment (art. 76 Law No. 19,300), and with the Framework Law on Climate Change the name was changed to the National Council for Sustainability and Climate Change (art. 20).

This Council, in accordance with the Framework Law on Climate Change, will serve as a multi-sectoral body to issue opinions on the climate change management instruments established by this law, their degree of progress and the effects generated by their implementation. It will also be able to make proposals to improve climate change management in the multiple sectors that participate in it.

Inter-ministerial Technical Team on Climate Change (ETICC)

The ETICC is an inter-ministerial coordination body created in 2015 and coordinated by the Climate Change Division, whose members are focal points of the ministries responsible for Climate Change, i.e. Ministries of Finance, Foreign Affairs, National Defense, Social Development and Family, Agriculture, Education, Energy, Health, Housing and Urban Planning, Public Works, Transport and Communications, Mining, Economy, National Assets, Women and Gender Equity and Environment (MMA, 2014).

In accordance with the Framework Law on Climate Change, the ETICC's objective is to collaborate with the Ministry of the Environment in the design, preparation, implementation, updating and monitoring of climate change management

instruments. It may also provide technical assistance to other state administration bodies or public services with competence in this area.

Regional Climate Change Committees (CORECC)

In accordance with the provisions of the Framework Law on Climate Change, there will be a CORECC in each region of the country, whose main function will be to coordinate the development of instruments for climate change management at the regional and communal level. In exercising this function, the Regional Climate Change Committees will be especially responsible for facilitating and promoting climate change management at the regional level, providing guidelines for integrating climate change into regional public policies, identifying synergies with national policies and encouraging the search for regional resources for the development of measures and actions for mitigation and adaptation to climate change and the means of implementation defined in the Regional Climate Change Action Plan and the Long-Term Climate Strategy.

With the publication of Law 21,455 the CORECC must adjust their conformation and will be integrated by the Regional Governor, who chairs the committee, the Regional Presidential Delegate, the regional secretaries of the ministries that make up the Council of Ministers for Sustainability and Climate Change, two representatives of the regional civil society, and one or more representatives of the municipalities or associations of municipalities of the region. The Regional Ministerial Secretariat of the Environment will also exercise the technical secretariat of the Regional Committees for Climate Change.

1.2.4. Institutional arrangements for the preparation of the reports under the UNFCCC

Chile, as a signatory to the UNFCCC and as a developing country (non-Annex I) has submitted four national communications, the last one was prepared by the MMA and submitted in 2021. Also, by decision 2/CP.17, the COP decided that non-Annex I Parties, in accordance with their capabilities and the level of support provided for information, should submit their first BUR by December 2014. Chile has submitted four BURs, the first in 2014, then in 2016, 2018 and a fourth in 2020.

The arrangements that Chile has made to comply with these reporting commitments are in line with the institutional framework presented above. The Climate Change Division of the Ministry of the Environment has coordinated the preparation of this report, developing for this purpose a process of information gathering, together with the public institutions with competence in climate change issues.

1.2.5. Process of analysis of the fourth BUR

Chile's fourth BUR was submitted to the UNFCCC on January 18, 2021 and underwent the International Consultation and Analysis (ICA) process during 2021. The ICA report¹ was finalized in January 2022.

¹ Available at: <https://unfccc.int/documents/441574>

2. National Greenhouse Gas Inventory, 1990–2020 series

2.1. Introduction

According to international agreements, developing countries, such as Chile, must submit their National GHG Inventory (INGEI) to the UNFCCC as part of national communications (every four years) and biennial update reports (every two years starting in 2014). To date, the country has complied with the submission of the five corresponding biennial reports, together with its inventory reports.

Chapter 2 of this Biennial Update Report is a summary of the National Greenhouse Gas Inventory Document of Chile, 1990–2020 series², which corresponds to the seventh *National Greenhouse Gas Inventory of Chile* (National GHG Inventory) submitted by Chile to the UNFCCC. The National GHG Inventory covers the entire national territory³ and includes emissions and removals of greenhouse gases (GHG) of anthropogenic origin not controlled by the Montreal Protocol⁴, and emissions of precursor gases in an annualized time series from 1990 to 2020. The results of the GHG and precursor gas estimates are presented at the national level; in kilotons⁵ (kt); and refer to 2020, the latest year of the inventory, unless otherwise specified. Positive numbers represent GHG emissions and precursor gasses while negative numbers represent

GHG removals. As an additional effort to estimate GHG emissions, the national and regional black carbon inventory is presented.

2.1.1. Institutional arrangements and preparation of Chile's National GHG Inventory

In response to the commitments acquired by the country regarding the reporting and presentation of its National GHG Inventory to the United Nations, the Climate Change Division of the Chilean Ministry of the Environment designed, implemented, and has maintained, since 2012, the National System of Greenhouse Gas Inventories of Chile (SNICHILE). This contains the institutional arrangements, the legal and procedural device established for the periodic and constant updating and compilation of Chile's National GHG Inventory, in accordance with national and international commitments related to this matter. The System has, therefore, the objective of guaranteeing the sustainability of the preparation of the National GHG Inventory in the country and maintaining the consistency of the GHG flows reported and the quality of the results.

Considering the important work of SNICHILE, the country has defined its objectives, lines of action and main roles in the Framework Law on Climate Change, specifically in Article 28. According to this article, SNICHILE will be administered by the MMA.

The permanent work of SNICHILE is divided into five lines of action that cover the areas and activities required for the fulfillment of the

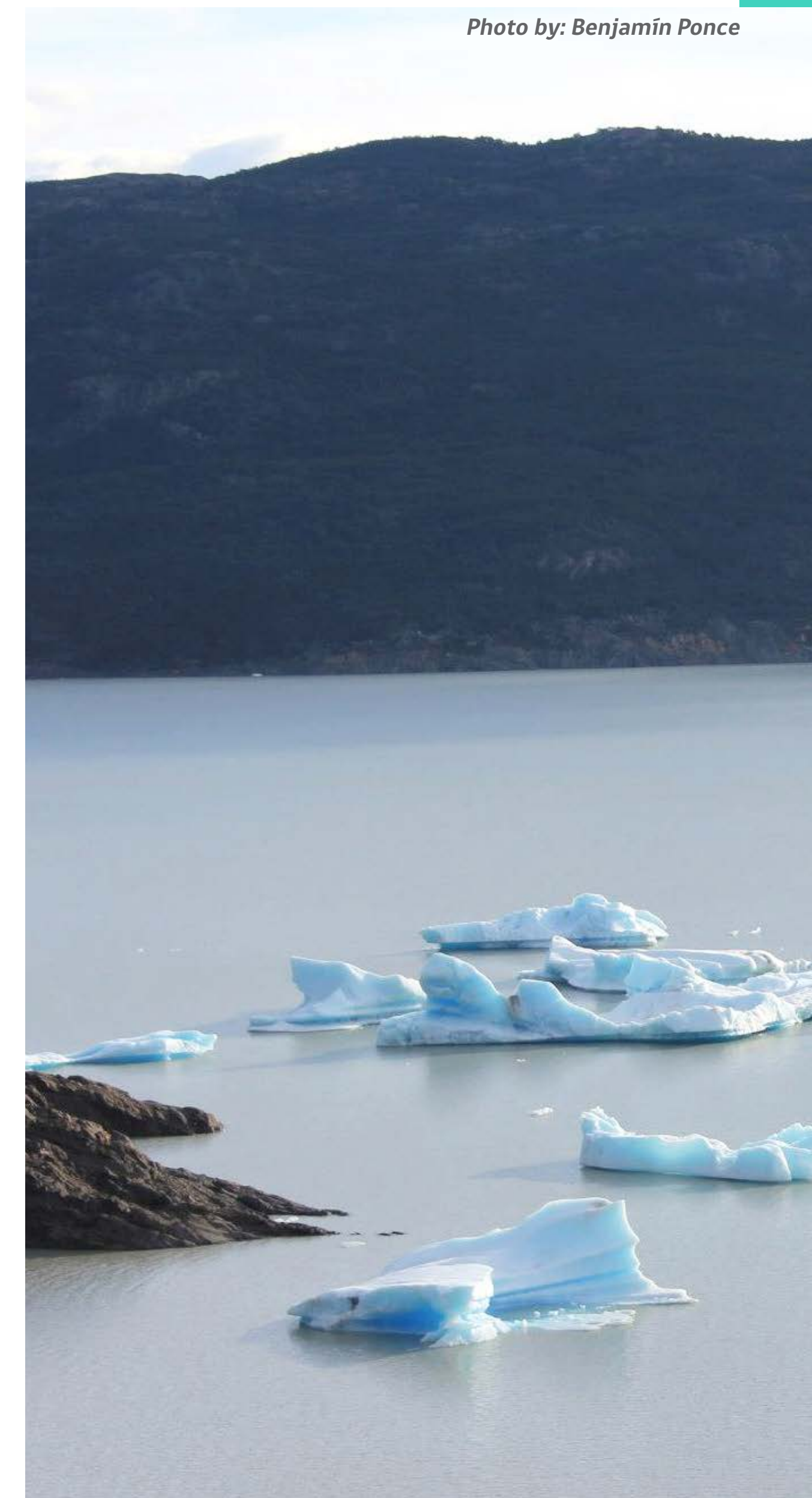
objectives, as well as aligning with the recommendations described in the 2019 Refinement of the 2006 IPCC Guidelines. These lines of action are operation of SNICHILE; updating of National GHG Inventory Chile; quality assurance and control system; capacity building and maintenance; archiving and communication (see details in Chapter 2).

2.1.2. Chile's National GHG Inventory update process

The process of elaboration of the present National GHG Inventory of Chile began in the first semester of 2021 and concluded in mid 2022. Each Sectoral Technical Team (ETC) prepares the GHG inventory for its own sector, which involves the collection of information, the calculation of GHG emissions and removals, and the preparation of the respective *Sector Inventory Document* (DIS) (see Figure 2 in Chapter 2). Then, the ETC reviews and compiles the Sectoral GHG Inventory (ISGEI), and develops the cross-cutting issues, to go on to generate the National Inventory Document (DIN). Then, each Sectoral Technical Team approves the final version of the NIR. Additionally, the ETC prepares the regional GHG inventories based on the information provided by the sectoral teams.

The previous National GHG Inventory presented in the fourth IBA went through the International Consultation and Analysis (ICA) process, which is the basis for guiding the updating process and prioritizing improvements in the short and medium term.

Photo by: Benjamín Ponce



² The National Greenhouse Gas Inventory Document of Chile 1990–2020 series is included as a technical annex to Chile's Fifth Biennial Update Report submitted to the UNFCCC.

³ Only continental, since not all the sources corresponding to the insular and Antarctic territory are estimated.

⁴ The GHG included are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆).

⁵ A kiloton (kt) is equivalent to one gigagram (Gg) or 1,000 tons.

2.1.3. Methodology and main sources of information

GHG and precursor gas estimates for Chile's National GHG Inventory, 1990–2020 series, were made in line with the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*⁶ and own calculation books for estimation based on the same guidelines: including key category analysis, uncertainty assessment, completeness assessment and recalculations. In addition, Chile's National GHG Inventory has been prepared in compliance with the *reporting requirements of the Convention's Guidelines for Biennial Update Reports from Parties not included in Annex I to the Convention*⁷ and the *Guidelines for the Preparation of National Communications from Parties not included in Annex I to the Convention*⁸. In an additional effort, the country reviewed and considered, during the update process, the provisions included in the *Modalities, procedures, and guidelines for the transparency framework for actions and support referred to in Article 13 of the Paris Agreement*⁹ (MPG). Particularly the provisions in paragraphs 17–58 were reviewed, trying to comply with these to establish possible needs in view of the delivery of the *first Biennial Transparency Report*.

2.2. National Greenhouse Gases trend

In 2020, net emissions¹⁰ nationally and by GHG type were as follows: CO₂ emissions accounted for 29,543 kt; CH₄ emissions accounted for 610 kt; and N₂O emissions accounted for 22 kt. In the case of fluorinated gases, HFC emissions accounted for 4,390 kt CO₂ eq; PFC emissions were 0.5 kt CO₂ eq; and SF₆ emissions were 191 kt CO₂ eq. Regarding precursor gases, in 2020 emissions nationwide were as follows: NO_x accounted for 263 kt; CO accounted for 1,051 kt; non-methane volatile organic compounds (NMVOCs) accounted for 352 kt; and, finally, SO₂ accounted for 318 kt (see Table 3 in Chapter 2).

2.2.1. Trends in GHG emissions and removals by sector

In 2020, Chile's GHG¹¹ balance accounted for 55,825 kt CO₂ eq, increasing by 429 % since 1990 and decreasing by 4 % since 2018 (see Table 4 and Figure 3 in Chapter 2). The main drivers of the GHG balance trend are CO₂ emissions generated by fossil fuel burning (accounted for in the Energy sector) and CO₂ removals from forest land (accounted for in the LULUCF sector). The decrease in the 2020 balance compared to recent years is due to effects of health measures related to the COVID-19 pandemic and its effects on the economy and displacement across the country, as evidenced by the drop in emissions from the Energy sector which

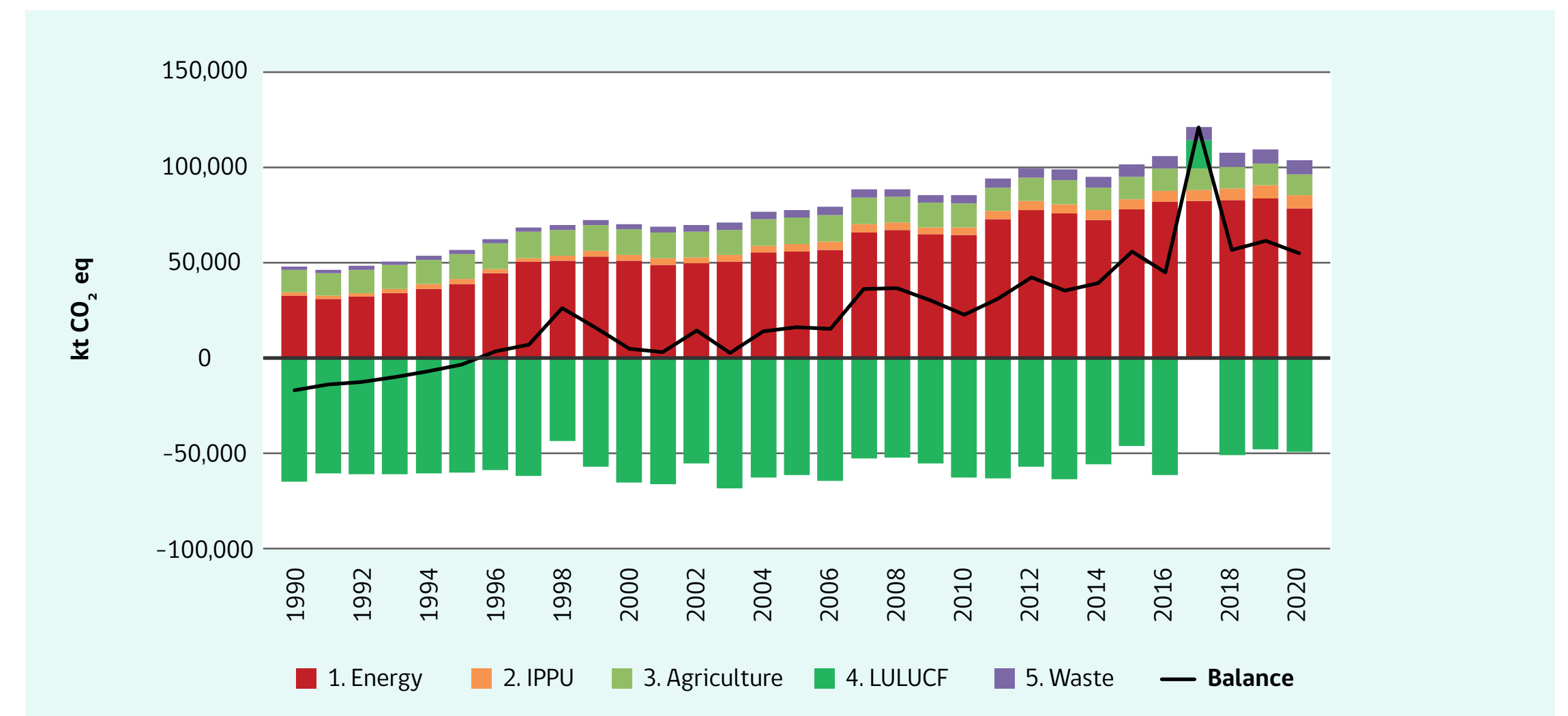
decreases by 5 % since 2018, emissions associated with transportation.

The observed values that escape the GHG balance trend (in 1998, 2002, 2007, 2012, 2015 and especially in 2017) are mainly consequences of GHG emissions generated by forest fires (accounted for in the LULUCF sector) and changes in the share of the main energy consumed in the country (diesel, gasoline, natural gas and coal). The large forest fires of 2017 impacted the central and southern part of the country, affecting about 570,000 ha of forest land, crops, and pastures mainly. Only forest land fires in 2017 accounted for 68,223 kt CO₂ eq, which is equivalent to more than what was emitted

in sum by land transport, electricity generation and industries during the same year.

Regarding the country's total GHG emissions¹² in 2020, they accounted for 105,552 kt CO₂ eq, increasing by 116 % since 1990 and decreasing by 4 % since 2018 (see Table 5 of Chapter 2). Regarding the share of each sector in the 2020 GHG balance in absolute terms¹³ (see Figure 3 of Chapter 2), the Energy sector accounted for 51 %, followed by the LULUCF sector (–32 %), the agriculture sector (7 %), the Waste sector (5 %), and finally the IPPU sector (4 %). This shows that, both in the GHG balance and in total emissions, the Energy sector is the most relevant sector.

Figure 3 of Chapter 2. National GHG Inventory of Chile: GHG balance (kt CO₂ eq) by sector, series 1990–2020



Source: MMA Technical Coordinating Team.

⁶ Retrieved from www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/index.html

⁷ Annex to Decision 17/COP8. Retrieved from <http://unfccc.int/resource/docs/spanish/cop8/cp807a02s.pdf>

⁸ Annex III of Decision 2/COP17. Retrieved from <http://unfccc.int/resource/docs/2011/cop17/spa/09a01s.pdf>

⁹ Decision 18/CMA.1. Retrieved from https://unfccc.int/sites/default/files/resource/CMA2018_3a02S.pdf

¹⁰ In this report, the term "net emissions" refers to the sum of GHG emissions and removals, also referred to as "GHG balance".

¹¹ The term "GHG balance" or "net emissions" refers to the sum of GHG emissions and removals expressed in carbon dioxide equivalent (CO₂ eq). This term includes the LULUCF sector.

¹² In this report, the term "total GHG emissions" refers only to the sum of national GHG emissions expressed in carbon dioxide equivalent (CO₂ eq). This term excludes emission sources and removal sinks from the LULUCF sector.

¹³ In this report, the term "absolute" refers to the magnitude of the value. Its purpose is to compare the magnitudes between GHG emissions and removals. In this sense, the values corresponding to removals will be accompanied by a negative sign to represent their quality as a sink.

Chapter 2 presents detailed information on the five sectors: Energy (including the reporting of information items); Industrial processes and product use; Agriculture; Land use, land-use change and forestry; and Waste.

2.2.2. GHG Intensity Indicators

It is important for the country to manage Chile's National GHG Inventory information to understand the evolution of GHG emissions in a broad context. To this end, intensity indicators have been defined that relate the GHG balance and total GHG emissions to the population (per capita). The population corresponds to statistics from the National Institute

of Statistics (INE) based on 1992, 2002 and 2017 censuses and population projection.

In 2020, the GHG balance indicator *per capita* was 2.9 t CO₂ eq per capita, increasing by 327% since 1990 and decreasing by 7% since 2018. The observed interannual variation, with peaks in 1998 and 2017, is mainly due to the influence of forest fires on the country's GHG balance.

On the other hand, the indicator total GHG emissions *per capita* (excluding the LULUCF sector) was 5.4 t CO₂ eq *per capita*, increasing by 53 % since 1990, and decreasing by 7 % since 2018 (see Figure 7 in

Chapter 2 below); this trend is influenced by emissions from the Energy sector which dominates the country's total GHG emissions.

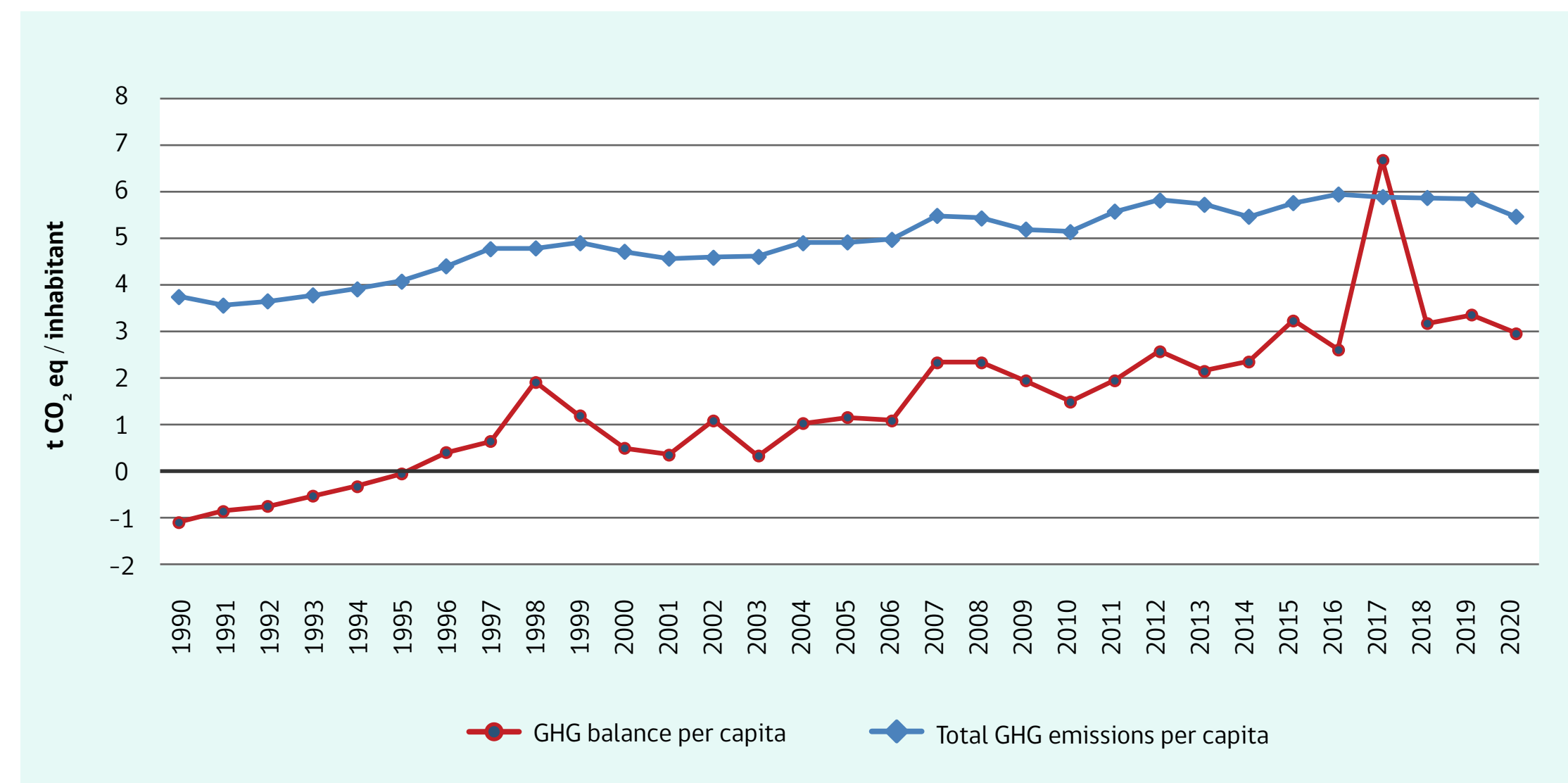
2.2.3. Trend in GHG emissions by sectoral authority

In 2021 the country presented to the public and the international community the Long-Term Climate Strategy (ECLP), which establishes sectoral climate goals and objectives to increase resilience and achieve emissions neutrality by 2050 at the latest. The ECLP assigns the emission sources of the inventory to the different sectoral authorities, which will have the obligation to comply with

sectoral budgets through the implementation of Sectoral Mitigation Plans, in coherence with what is also established in the Framework Law on Climate Change.

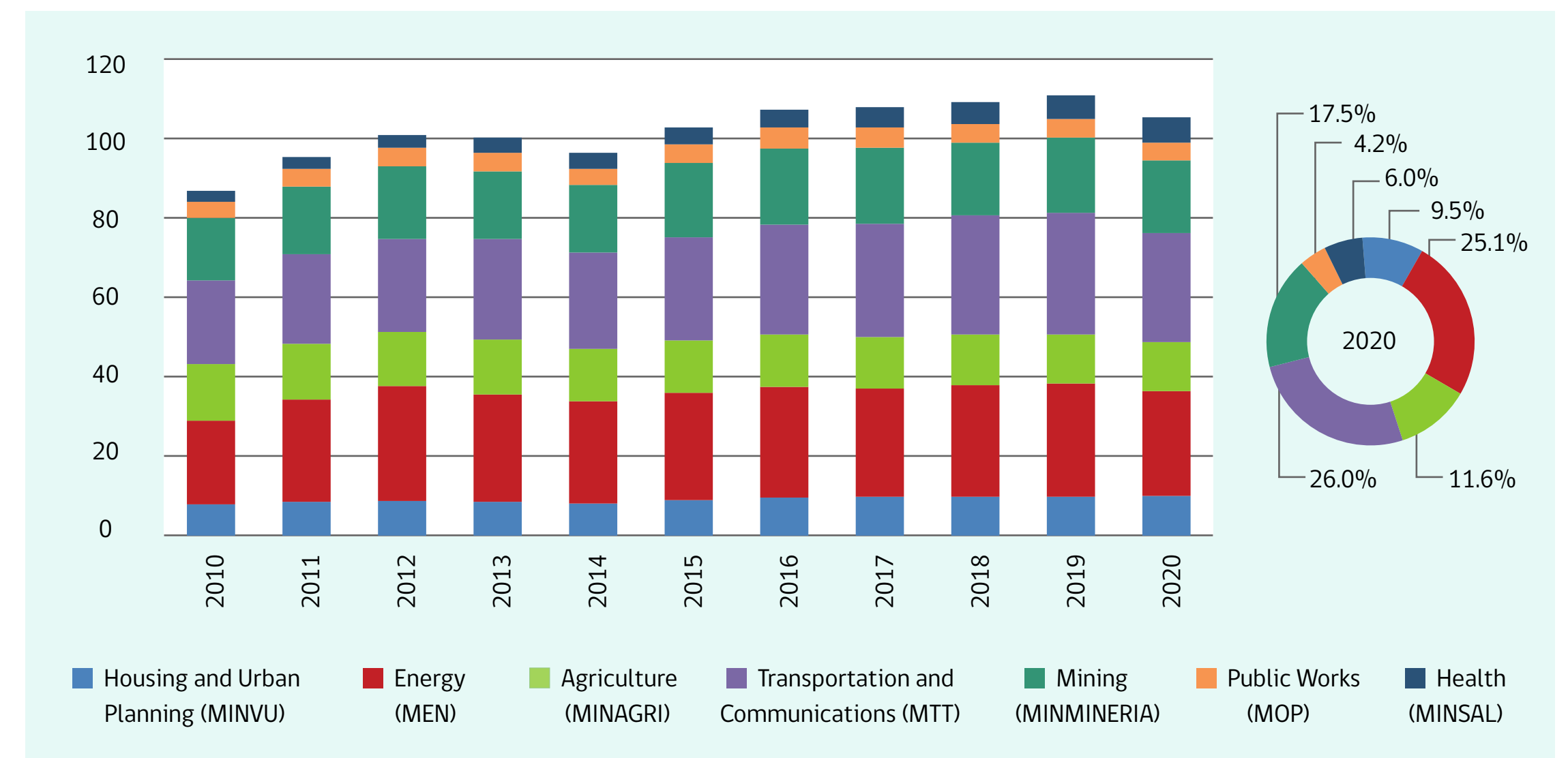
To understand the trend and cause of sectoral emissions, and to propose base information for the development of mitigation policies, the trend of GHG emissions by sectoral authority for the last few years is presented (see Table 7 in Chapter 2; see Figure 8 below). It is important to note that the allocation process does not include the GHG balance of the LULUCF sector.

Figure 7 of Chapter 2. National GHG Inventory of Chile: GHG balance per capita and total GHG emissions per capita (t CO₂ eq per capita), series 1990–2020



Source: MMA Technical Coordinating Team based on National Statistics Institute (INE).

Figure 8 of Chapter 2. National GHG Inventory of Chile: trend of GHG emissions (Mt CO₂ eq) by authority, series 2010–2020



Source: MMA Technical Coordinating Team.

2.3. Black carbon

2.3.1. National context

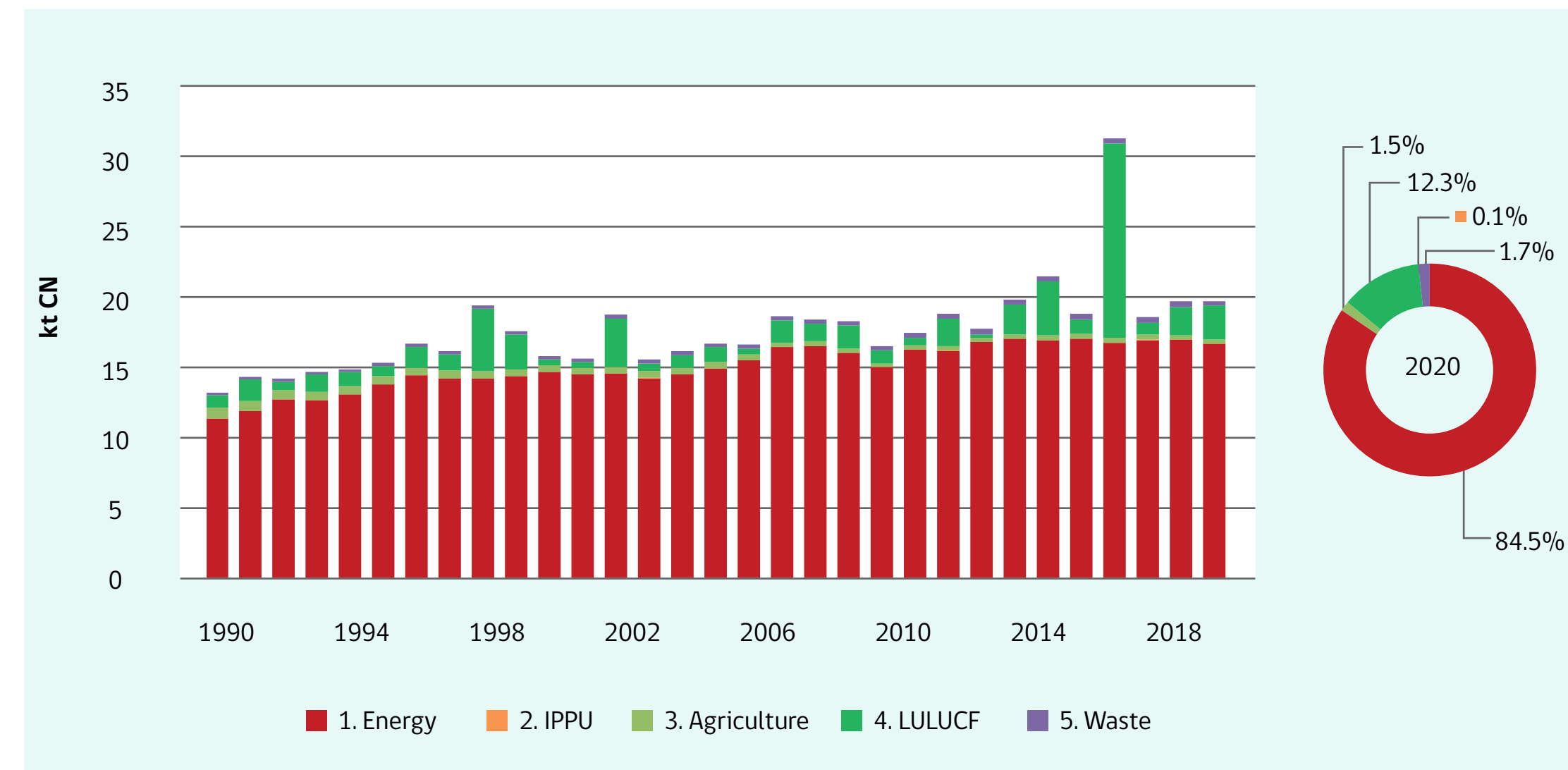
In the 2020 NDC, the country recognizes the importance of short-lived climate forcings (SLCF), in particular the importance of black carbon (BC). Included in the Contribution is a target to reduce BC emissions by at least 25% by 2030 from 2016 levels. The BC trajectories to 2050 were constructed based on GHG carbon neutrality scenarios with an international estimation methodology. This estimation served as a basis for including a long-term vision in the climate management of BC. The inclusion of BC within the ECLP includes national and regional BC information and reporting system; knowledge generation; black carbon measurements within the air quality monitoring network.

2.3.2. Black carbon emissions trend

In 2020, total BC emissions reached 19.8 kt, representing an increase of 49 % since 1990 and an increase of 6 % over 2018 (see Table 10 in Chapter 2 below). The trend of the series is dominated in almost the entire period by emissions from the burning of fossil fuels and biofuels, which are accounted for under the Energy sector (see Figure 27 in Chapter 2 below). However, in some years (1998, 1999, 2002, 2014, 2015 and 2017), emissions from forest fires, emissions accounted for in the LULUCF sector, changed the trend of the series becoming an important part of BC emissions at the national level. The latter is clearly reflected in 2017, where the country's total emissions reached 31.4 kt of BC and emissions from forest fires reached a similar level to emissions from the Energy sector.

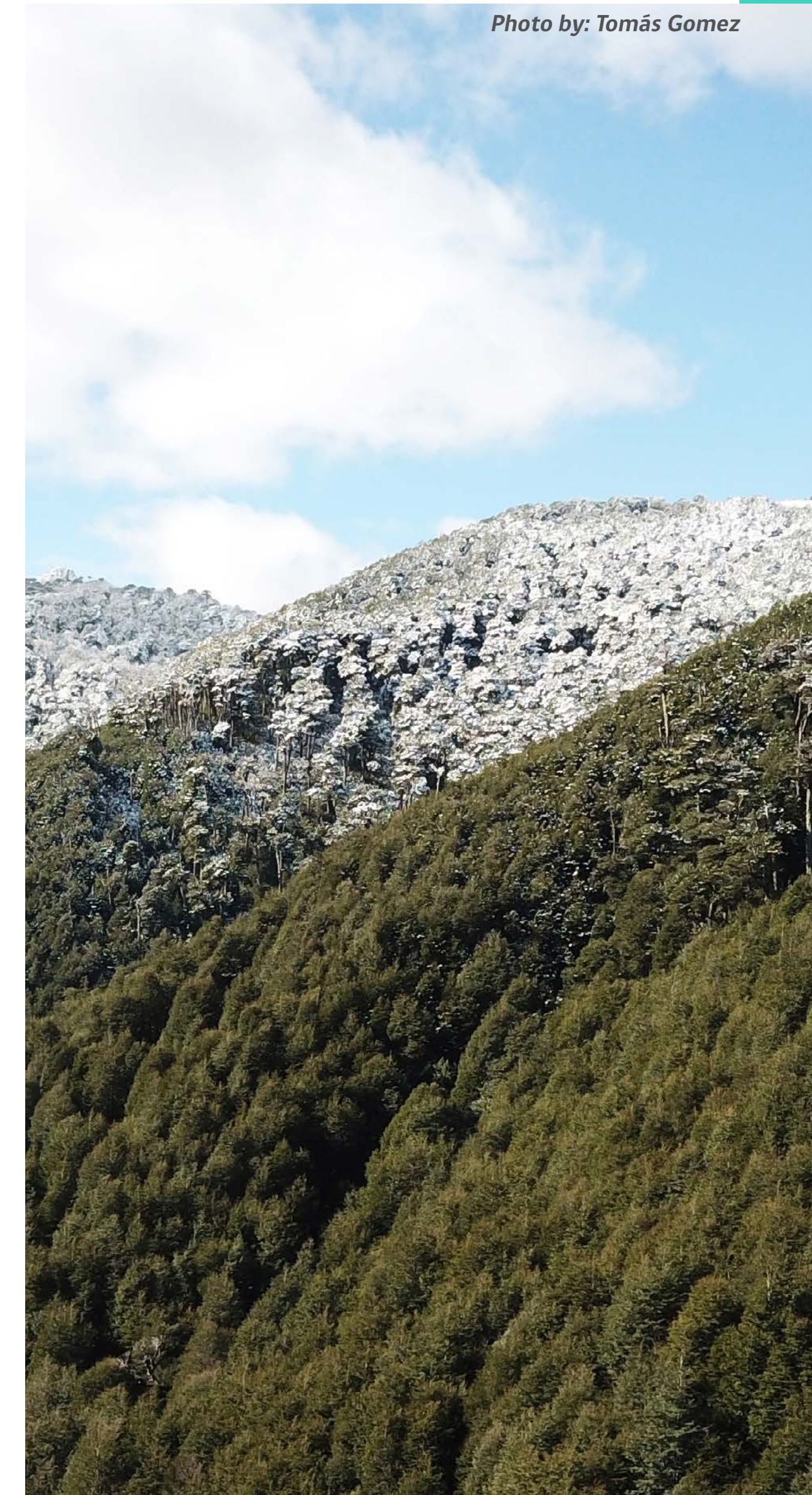
It is important to note that BC emissions follow a different trend than GHG emissions. On the one hand, emissions from the energy industries are not relevant in terms of BC, while for GHG emissions they represent, in some years, more than 35 % of the emissions of the energy sector. This is mainly because BC emissions from power generation processes are very low due to controlled combustion and abatement systems in power plants. On the other hand, accounting for emissions from biomass burning is important for BC emissions, being one of the largest emitters.

Figure 27 in Chapter 2. Trend of BC emissions (kt) at the national level



Source: MMA Technical Coordinating Team.

Photo by: Tomás Gomez



3. Mitigation Policies and Actions

3.1. Introduction

The latest IPCC report indicates that emissions have continued to increase over the last decade (2010–2019), as has CO₂ concentration since 1850. It also notes that, despite various calls for increased ambition, the NDCs announced before COP26 would make it likely that warming would exceed 1.5°C during this century, perhaps staying within 2.0°C depending on the speed of implementation of mitigation actions after 2030. In this regard, the report also highlights that there are scenarios in which it is possible to limit the temperature increase, requiring a strengthening and acceleration of policies to increase mitigation.

The importance of mitigation in the context of climate change lies not only in the net reduction of GHG emissions to the atmosphere, but also in the benefits that mitigation actions bring, often directly contributing to improvements in production processes, reduction of air pollution, better planning, energy savings, among others. It should be noted that these benefits are key to the design of new policies that allow countries to increase their level of ambition with a view to meeting the temperature limit targets of at least 2.0 °C agreed under the Paris Agreement.

Faced with such challenges and in line with its vision on climate change, Chile has taken two important steps to increase, strengthen and sustain climate action: the development of its first Long-Term Climate Strategy (ECLP) in 2021 and the enactment of the Framework Law on Climate

Change (LMCC) during 2022. The ECLP establishes resilience building and emission neutrality as major goals by 2050, which translates into short, medium, and long-term sectoral level objectives, also in line with the NDC update presented in 2020. All this is in turn supported by the LMCC which, in addition to recognizing these goals, defines the governance and instruments at national, regional, and communal levels to achieve them.

3.2. International context

This report considers and includes information in line with the Enhanced Transparency Framework and the guidelines for its implementation detailed in the **Modalities, procedures, and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement** (MPG), including additional information regarding the monitoring of Chile's NDC update mitigation commitments; and Chile's GHG projections and scenarios. Additional content will be presented in the National Greenhouse Gas Inventory Document, 1990–2020 series (as a Technical Annex to this report).

During COP26, the parties agreed on the Glasgow Climate Pact, which sets out a work program to increase ambition and implementation of mitigation measures. It also calls on parties to review and strengthen their 2030 targets before the end of 2022, to align them with the temperature goal of the Paris Agreement. Additionally, at COP26, Chile signed the *Global Methane Pledge*, which seeks to reduce global anthropogenic methane emissions in all sectors by at least 30% below 2020 levels by 2030. Chile is therefore working, in conjunction with the *Global Methane Hub* initiative, to review and strengthen its CH₄

mitigation commitments. With this, the country recognizes the effect of methane as a local pollutant and GHG and is expected to deepen the actions related to the reduction of this gas.

3.3. Chile facing mitigation

3.3.1. Framework Law on Climate Change (LMCC)

The LMCC creates and strengthens the legal framework so that the country can face climate change in terms of mitigation and adaptation with a long-term view and thus comply with its international commitments assumed in the Paris Agreement. The most relevant instruments for mitigation issues are described in Chapter 3.

It is relevant to point out that the LMCC grants responsibilities to the sectoral ministries in relation to the follow-up of the measures established in the Sectoral Mitigation Plans and to report annually on their implementation considering the MRV criteria of compliance with the goals established in the ECLP. On the other hand, it is the responsibility of the MMA to request information regarding MRV indicators of compliance with the measures in the plans and to request, record and manage information on the reduction, absorption, and storage of GHG emissions generated by mitigation actions.

3.3.2. Long-Term Climate Strategy and Sectoral Emissions Budgets

The ECLP allocates sectoral emission budgets and mitigation efforts for the period 2020–2030 to the seven most relevant ministries in terms of mitigation, which must comply with these budgets, and which together must not exceed the national committed budget (see Table 2 of Chapter 3). These are: Ministry of Energy, Ministry

of Transport and Communications, Ministry of Mining, Ministry of Agriculture, Ministry of Housing and Urban Planning, Ministry of Public Works, and Ministry of Health.

The allocation of budgets considers the principles of cost-effectiveness associated with the prioritization of effective mitigation actions that also represent the lowest economic, environmental and social costs; and the principle of equity, which translates into the State seeking a fair allocation of burdens, costs and benefits, safeguarding the ability of future generations to meet their own needs, with a focus on gender and special emphasis on sectors, territories, communities and ecosystems vulnerable to climate change.

3.3.3. Sectoral mitigation plans

To comply with their sectoral budgets, sectoral authorities must prepare sectoral mitigation plans (PSM), which will establish the set of actions and measures to reduce and absorb GHG, so as not to exceed the budget allocated in the ECLP.

For the preparation of the PSM and their subsequent implementation, the sectoral authorities and the MMA will have to maintain permanent coordination, since many mitigation actions could be linked between the different ministries for their correct implementation. It is expected that these plans will interact with the regional climate change action plans (PARCC) and with the communal action plans (PACCC).

To facilitate this process, the MMA is working on the preparation of a guide to support the preparation of the PSM, the development of general guidelines for the MRV of mitigation policies and actions, and the preparation of procedural regulations that will

establish the procedure for the preparation, review and updating of the Sectoral Mitigation Plans.




3.4. Reinforcement of Chile's Nationally Determined Contribution

3.4.1. Current NDC

Chile's NDC 2020 presents, in addition to the mitigation and adaptation components, two types of specific commitments: **1)** integrated




commitments component, which are those commitments that have an impact on both adaptation and mitigation, and **2)** social pillar of just transition and sustainable development. Additionally, the NDC relates each commitment to the Sustainable Development Goals (SDG) on which it impacts. Mitigation targets M1 and M2 are noted below:

Table 3 of Chapter 3. Contribution to GHG mitigation

CONTRIBUTION	SDG
M1) Chile commits to a GHG ¹⁴ emission budget not exceeding 1,100 Mt CO ₂ eq between 2020 and 2030, with a GHG emissions maximum (peak) by 2025, and a GHG emissions level of 95 Mt CO ₂ eq by 2030.	  

Source: NDC Update 2020. MMA, 2020.

Table 4 of Chapter 3. Contribution in the matter of black carbon

CONTRIBUTION	SDG
M2) Reduce total black carbon emissions by at least 25% by 2030, with respect to 2016 levels. This commitment will be implemented primarily through national policies focused on air quality. In addition, it will be monitored through permanent and periodic work to improve information available in the black carbon inventory.	  

Source: NDC Update 2020. MMA, 2020.

3.4.2. Reinforcement proposal

At COP26, the Glasgow Pact (Decision 1/CMA.3 paragraphs 22, 29 and 37) requests Parties to review and strengthen the 2030 targets in their NDCs as necessary to align them with the Paris Agreement temperature goal by the end of 2022. For this reason, the country decided to revise its NDC and strengthen it along the following lines: Socio-ecological just transition¹⁵; Climate Change Framework Law and anticipation of results in carbon neutrality and resilience; Long-Term Climate Strategy, sectoral transformations, and implementation; New commitment to methane emissions (CH₄).

3.5. Monitoring of the mitigation component of the NDC

To follow up on the commitments made, the country has preliminary information on GHG mitigation progress, considering the targets indicated in Chile's current NDC for the GHG mitigation component (absolute GHG emissions targets) and LULUCF integration component (forestry targets). To account for the country's progress in meeting the mitigation contribution and the relevant integration components (4 and 5) for Article 4, and in relation to its targets, the following indicators are defined:

- Percentage of budget achieved: cumulative GHG emissions between 2020 and the last year presented by the National GHG Inventory of Chile, excluding the LULUCF sector, divided by the committed budget.

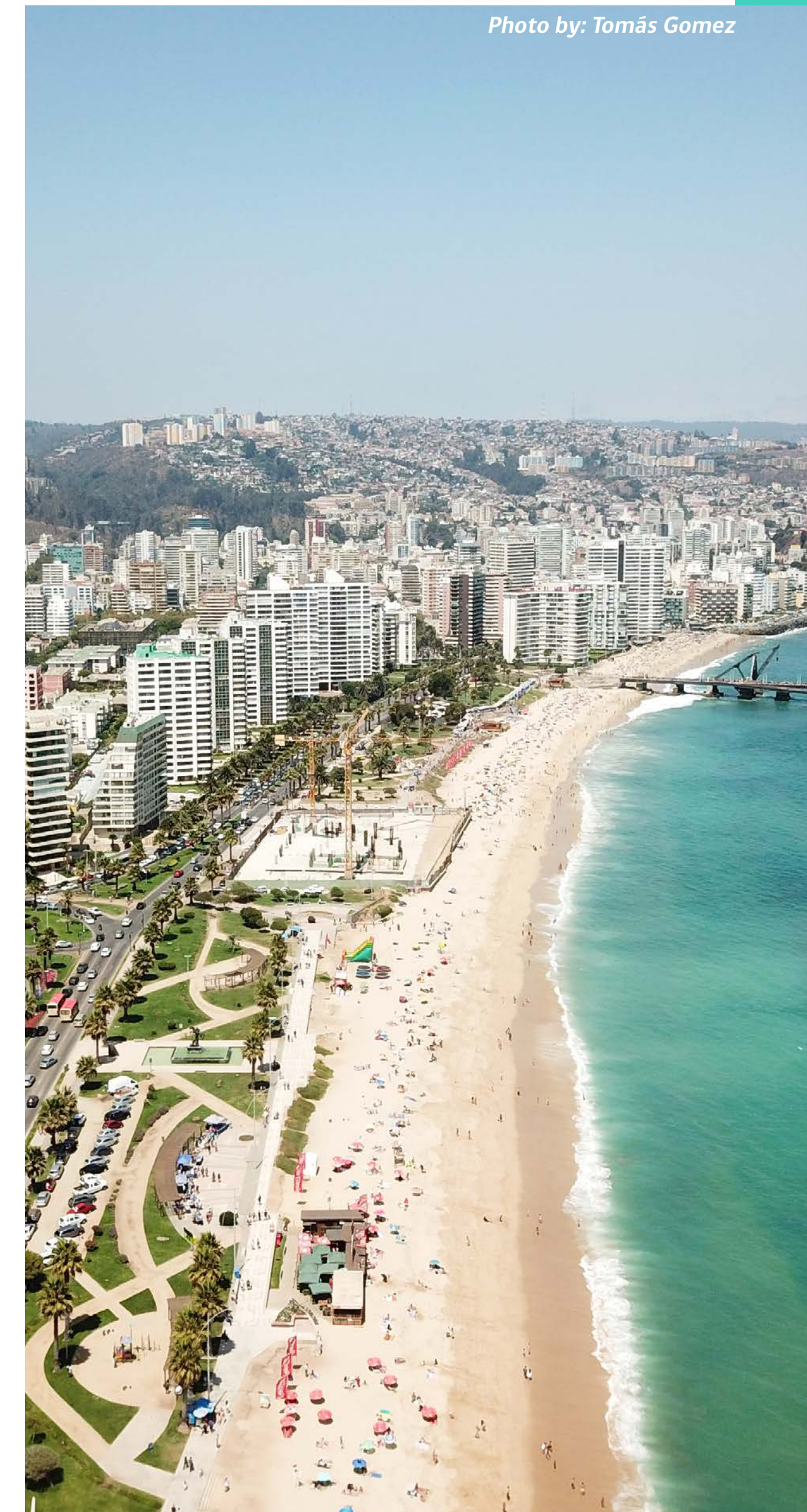


Photo by: Tomás Gomez

¹⁴ The emissions budget shall be understood as the sum of annual emissions for a given period of years, excluding the LULUCF sector.

¹⁵ Socio-ecological just transition is the process that, through social dialogue and collective empowerment, seeks the transformation of society into a resilient and equitable one that can cope with the social, ecological and climate crisis.

- Peak year of emissions between 2020 and the latest year presented by the National GHG Inventory of Chile, excluding the LULUCF sector.
- Percentage difference of the last reported year with respect to the 2030 emissions target: GHG emissions of the last year presented by the National GHG Inventory of Chile, excluding the LULUCF sector, minus the emissions committed to 2030, divided by the emissions committed to 2030.
- Percentage of managed area of native forest: managed area of native forest between 2020 and the last year reported by the National Forest Corporation (CONAF), divided by the managed area of native forest committed to 2030 (200,000 ha).
- Percentage of absorption achieved by the managed area of native forest: net absorption achieved by the managed area of native forest for the last year reported by CONAF, divided by expected absorption of the managed area of native forest committed to 2030.
- Percentage of reforested area: area reforested between 2020 and the last year reported by CONAF, divided by the committed reforested area 2030 (200,000 ha).
- Percentage of absorption achieved by the reforested area: net absorption achieved by the reforested area for the last year reported by CONAF, divided by the expected absorption of the committed reforested area by 2030.

The progress of the defined monitoring indicators is presented in Table 5 of Chapter 3.

3.6. Mitigation measures, actions, and policies

Chapter 3 reports on mitigation measures with an impact on the country's GHG emissions, reporting their progress and/or effectiveness. The progress is based on whether the measure has advanced or not, and the effectiveness is based on the number of emissions reductions or increases in removals achieved. In this report, the relevance of reporting the reduction of emissions of the measures, i.e., effectiveness, is raised.

During the information gathering process, the ministries and public institutions have been informed that for the preparation of the first Biennial Transparency Report (BTR) in 2024, effectiveness information will be requested, since it is recognized the need and relevance of progressively quantifying these *ex-post* emission reductions, to be able to quantify the sectoral mitigation efforts committed in the ECLP.

In this opportunity, two groups of public institutions that report their mitigation policies and actions have been defined: **1)** sectoral mitigation ministries that must comply with defined emissions budgets and mitigation efforts, according to the LMCC and the ECLP (Ministry of Energy, Ministry of Transport and Communications, Ministry of Mining, Ministry of Health, Ministry of Agriculture, Ministry of Public Works, Ministry of Housing and Urban Planning); **2)** public institutions that, although they do not have compliance obligations in terms of emission budgets or mitigation efforts, the work they carry out is relevant for the achievement of mitigation

goals at the country level, which is why they have been invited to report their progress in the implementation of measures (Office of Legislative Implementation and Circular Economy and the Ozone Department of the Climate Change Division, both of the Ministry of the Environment; Production Development Corporation; Ministry of Social Development and Family; Ministry of National Assets; Undersecretariat of Regional and Administrative Development of the Ministry of the Interior and Public Security; Chilean Navy). Details are presented in Chapter 3 and in their respective Annexes.

3.6.1. Mitigation measures of the main sectoral ministries

The set of mitigation measures implemented by the public sector has an impact on GHG emissions, where a large part of the mitigation efforts is expected to come from the ministries or sectoral authorities, which would represent the largest GHG emissions in the country and which correspond to the ministries of Energy, Transportation and Communications, Mining, Health, Agriculture, Public Works and Housing and Urban Planning.

• Ministry of Energy

The Ministry of Energy has the largest participation in the design and implementation of mitigation measures to achieve carbon neutrality in the country. The integration and articulation of these measures is carried out through the establishment of long-term public policy instruments led by the Ministry of Energy, such as the National Energy Policy and the regulatory mechanisms of Long-Term Energy Planning (PELP).

In parallel to the updating of the National Energy Policy to 2050 and the construction of the Energy Agenda 2022–2026, the Ministry of Energy has carried out other processes that complement the Policy and pursue the same sustainability objectives, such as planning for carbon neutrality; the Just and Sustainable Transition Strategy in the energy sector, which seeks to make the energy transition compatible with the social, labor and environmental spheres associated with it and which will initially address the challenge of retiring coal-fired plants, but will later serve as a basis for other necessary transformations in the sector; the Renewable Energy Strategy in the Heating and Cooling sector; the National Green Hydrogen Strategy; the National Energy Efficiency Plan; the National Electro-mobility Strategy; the Strategy of Economic Instruments for the Energy Transition, among others.

• Ministry of Transportation and Communications

Based on the sectoral vision of sustainable mobility, expressed in the National Strategy for Sustainable Mobility, different actions have been activated to improve the institutional organization in environmental aspects, highlighting the reconfiguration of the Environment and Climate Change Committee. The purpose of the strategy is to incorporate environmental objectives in the various areas of action of the Ministry of Transportation and Communications in order to advance in the goals established in the Long-Term Climate Strategy and in the National Strategy for Sustainable Mobility and to support the future construction of the National Program for Sustainable Urban Mobility and the Sectoral Plan for Mitigation of the Transportation Sector.

In addition, inter-institutional coordination has been strengthened in various aspects such as: promoting the preparation of Metropolitan Urban Transportation Master Plans in future metropolitan areas, strengthening Public Transportation Planning instruments (PMITP), advancing in coordination with the Ministry of Housing and Urban Planning in the generation of urban integration mechanisms (social integration polygons), incorporating the notion of sustainable mobility in Strategic Environmental Assessment, as well as promoting integrated urban planning and the generation of balanced density patterns. Efforts have also been made to include sustainable mobility criteria in land use planning and rural development.

- **Ministry of Mining**

To reduce this consumption and reduce GHG emissions in the mining sector, certain initiatives such as the incorporation of renewable energies have been encouraged. Chilean mining is making significant progress in the use of Non-Conventional Renewable Energies (NCRE). Already in 2021, 44% of mining electricity consumption is from clean sources and in 2025 it is expected that 62% of the industry 's electricity demand will come from this type of energy.

The National Mining Policy 2050 (PNM 2050) is a reference point for the industry and the State. This policy sets goals for the industry and the State, in the short (2025), medium (2030) and long term (2050) to meet the objective of developing a sustainable mining industry that provides the minerals that the world will require to face the climate crisis, promotes employment, investment and progress in the regions. The PNM 2050 is based

on the pillars of economic, social, and environmental sustainability; however, this policy must be adapted to new scenarios and challenges. To this end, we are working on its revision, especially with the inclusion of weakly considered actors and due coherence with the Government Program.

State-owned companies have also made progress in mitigating their GHG emissions. The National Copper Corporation (CODELCO) launched its Sustainability Policy and the National Mining Company (ENAMI), on the other hand, is making progress in training its professionals in energy management and is also in the process of reviewing electricity supply contracts to supply its operations with renewable sources. The Mining Council is a trade association that brings together the largest mining companies that produce in Chile, and as part of this council, the associated large mining companies have set corporate-level goals for reducing emissions.

- **Ministry of Health**

In 2020, the total emissions allocated to this ministry reached 6.3 Mt CO₂ eq, increasing by 13.6% compared to 2018 and representing 6.0% of national emissions excluding the LULUCF sector. The increase in emissions is mainly due to emissions generated by waste disposal, in line with the increase in the country's population. With respect to emissions by 2020, 92% are the result of the disposal of municipal and industrial solid waste. Thus, among the mitigation measures identified by the sector, it should be noted that in waste management matters, the Ministry of Health is responsible for establishing and monitoring the sanitary conditions to be met by waste disposal

facilities, including greenhouse gas emissions associated with this activity, as well as improving the practices used in the management of waste from health care facilities, as is the case of the rationalization of interregional transportation of waste for treatment, which will result in the reduction of CO₂ emissions.

- **Ministry of Agriculture**

Although mitigation measures in the sector have historically focused on the forestry component, since the publication of the ECLP and the LMCC, the agricultural component has acquired greater relevance as the object of mitigation instruments and actions. Regarding specific instruments, in 2021 the Ministry of Agriculture presented the Agri-food Sustainability Strategy, a sectoral policy whose vision is to position the national agri-food sector as a supplier of food produced in a sustainable manner for Chile and the world, committed to people, communities, the environment and the development of local economies. Additionally, the PLACA initiative (Platform for Climate Action for Agriculture in Latin America and the Caribbean) launched in 2019 and supported by the Ministry of Agriculture is being implemented. This platform is a regional mechanism for collaboration between Latin American and Caribbean countries on agriculture and climate change, aimed at productive agricultural development, adapted to the effects of climate change, resilient and low in GHG emissions.

With respect to the relevant instruments and policies related to the forestry component, one of the instruments developed to meet the goal contained in the NDC is the National REDD+ Strategy



(Reducing Emissions from Deforestation and Forest Degradation - REDD), which in the case of Chile is called the National Strategy for Climate Change and Vegetation Resources (ENCCRV), which is led by CONAF as the focal point.

- **Ministry of Public Works**

In 2020, the total emissions allocated to this ministry reached 4.5 Mt CO₂ eq, decreasing by 4.0% compared to 2018 and representing 4.2% of national emissions excluding the LULUCF sector. The main cause for the decrease in emissions allocated to the Ministry of Public Works is the decrease in emissions produced by sludge generation in most of the country. However, cement production and electricity demand offset the decrease with their respective increases. Regarding the participation of the categories in 2020, 37%

corresponds to domestic and industrial water treatment, 25% corresponds to emissions generated by electricity demand for public use and water treatment, and 20% corresponds to emissions from cement production.

• **Ministry of Housing and Urban Planning**

In the area of climate change, this ministry works in a comprehensive and coordinated manner with other entities in the territories, at various scales such as housing, neighborhoods, and cities. The National Urban Development Policy (PNDU) states that it is key to move towards sustainable urban development, which considers both the sustainable construction of the city and the efficient management of energy and the management of natural resources and waste, which will lead to a reduction in the generation of GHG emissions. Within the framework of the Circular Economy, the Ministry of Housing and Urban Planning is developing a series of actions to collaborate in GHG mitigation. Additionally, at the national level, the National Urban Parks Policy was developed to protect and strengthen the vital role that urban parks play in the sustainability and resilience of our cities, in the wellbeing and quality of life of their inhabitants, and in the future development of the country.

In the construction sector, two instances are mentioned at the national level, the first is the updating of the National Sustainable Construction Strategy (ENCS) and the second is the completion of the development of the National Strategy for Carbon Footprint in Construction. In the area of neighborhoods, the aim is to reduce greenhouse gas emissions associated with urban planning, by

means of two plans that are incorporated into each master plan that the program intervenes in selected neighborhoods starting in 2020 with 100 neighborhoods that begin the process and should complete the intervention five years later (year 2025). At the housing level, the Thermal Conditioning Subsidies, and the Subsidy for new thermal standards in areas with an Atmospheric Decontamination Plan (PDA) will continue. Other measures planned are the Energy Rating System and the Sustainable Housing Certification.

3.6.2. Regional mitigation efforts

The Regional Climate Change Action Plans (PARCC) are the first climate management instruments focused on the subnational level, which are defined in the LMCC. In addition, the law establishes minimum contents that must be incorporated in the PARCC.

In terms of elaboration, four PARCC have been presented: Atacama, O'Higgins, Los Ríos, and Los Lagos. Table 21 in Chapter 3 shows the main efforts made at the regional level in climate change related to mitigation.

3.6.3. Local mitigation efforts

In Chile, climate action will be formally and permanently integrated into the management of regional and local governments through the development and updating of current strategic development and territorial planning instruments and the climate change management and planning instruments proposed in the LMCC. Integrated coordination and cooperation among the country's regions and municipalities will be key to achieving these goals while maintaining coherence with

national policies; specific strategies and actions may differ among different territories, depending on their contexts and realities.

The formation of the CORECC, the development of the first four PARCC, and the notable efforts of some municipalities to develop Communal Action Plans on Climate Change (PACCC), are evidence of the beginning of a multilevel coordination process between the main objectives established in national public policies and in management instruments at the regional and communal levels.

Regarding the communal efforts on climate change, Chapter 6 of the ECLP, for Climate Change Management at Regional and Local Level, integrates goals linked to the new Recognition System for Local Governments of the HuellaChile Program, at the level of reporting and declaration of GHG inventories, and mitigation actions at the communal level. This is in addition to the elaboration of PACCC included in the LMCC, which must be prepared by the municipalities within three years (by 2025). Details on commitments and actions reported at the local level are presented in Table 22 of Chapter 3.

Within the national initiatives with local impact, the 5BUR reports on the following: Municipal Environmental Certification System (SCAM); HuellaChile Program; Energy Community; Other initiatives (Chilean Network of Municipalities facing Climate Change, Association of Municipalities for Environmental Sustainability).

The international initiatives and collaborative networks are presented in Table 25 of Chapter 3,

which comprise Pacts and Alliances with differentiated approaches.

3.6.4. Private mitigation efforts

The public-private actions reported in this document have been managed by the Sustainability and Climate Change Agency (ASCC) and the HuellaChile Program.

The ASCC is a CORFO committee whose mission is to promote the inclusion of the climate change dimension and sustainable development in the private sector and in the territories. This, through voluntary agreements, coordination with other public institutions, promotion initiatives and the implementation of programs and projects that contribute to the construction of a sustainable, resilient, and low-carbon economy. One of the agency's main instruments consists of Clean Production Agreements (APL), which are agreements entered into between a business sector and State administration bodies whose objective is to apply clean production through specific goals and actions and thus contribute to the sustainable development of companies. From 2012 to 2020, 115 APL have been signed with a reduction of 1,114,894 t CO₂ eq.

The HuellaChile Program was created by the MMA with the objective of promoting the quantification, reporting and management of GHG emissions at the organizational level in the public and private sectors. As of July 2022, 1,706 organizations from different economic sectors in Chile's public and private sectors have participated (see Figure 15 in Chapter 3). During the operation phase, the HuellaChile Program has delivered a total of 952

seals of recognition, consisting of: 863 seals of quantification, 63 reduction seals, 10 neutralization seals and 16 seals for excellence in GHG management (see Figure 16 of Chapter 3). By July 2022, more than 100 face-to-face and virtual workshops on the calculation and management of GHG emissions have been held, with more than 3,000 participants in different cities of the country.

3.6.5. Nationally Appropriate Mitigation Actions

In Chile there are six sectoral NAMA registered in the UNFCCC NAMA Registry, with different levels of maturity and available information, of which three are currently being implemented, two have not made any progress and one has been completed.

To date, these projects have been incorporated into the interest of the public institutions in charge of them to continue advancing in their implementation; however, in some cases the projects have not been able to be implemented due to lack of resources. In other cases, where NAMAs have been partially or fully implemented, some of their activities are currently part of other public policies of the institutions in charge.

Given the limited progress in the implementation of NAMA projects, Chile will report its progress separately for the last time in this Fifth Biennial Update Report and in the following reports will be reported as part of the sectoral progress.

3.6.6. Application of carbon pricing to address environmental externalities

Since 2017, Chile has incorporated carbon pricing

instruments as part of its range of tools to address the climate crisis. Their introduction in the public policy arena has followed an implementation path in line with the development of public and private capacities. Chapter 3 provides details of the following initiatives linked to the application of carbon pricing: Clean Development Mechanism of the Kyoto Protocol; Partnership for Market Readiness; Partnership for Market Implementation; Green Taxes; Tax Modernization; GHG Emission Standard with Offsetting Instrument; Social Carbon Pricing.

3.7. Greenhouse gas emission projection scenarios

Chapter 3 presents the projection of sectoral emissions that were considered in Chile's NDC. These projections include the latest version of scenarios developed in the Ministry of Energy's 2022 Long-Term Energy Planning (PELP) process. Two of the three scenarios consider compliance with emissions neutrality no later than 2050, as defined by the LMCC, while one of them reaches emissions neutrality after 2050. A summary of the considerations for each scenario is presented in Table 28 of Chapter 3. For more details, we suggest reviewing the Long-Term Energy Planning (PELP) ¹⁶ update document.

This first presentation of projections seeks to anticipate the responsibilities of the Enhanced Transparency Framework that the country will have from the delivery of its first Biennial Transparency Report in 2024 and is framed within the framework of the implementation of Chile's National

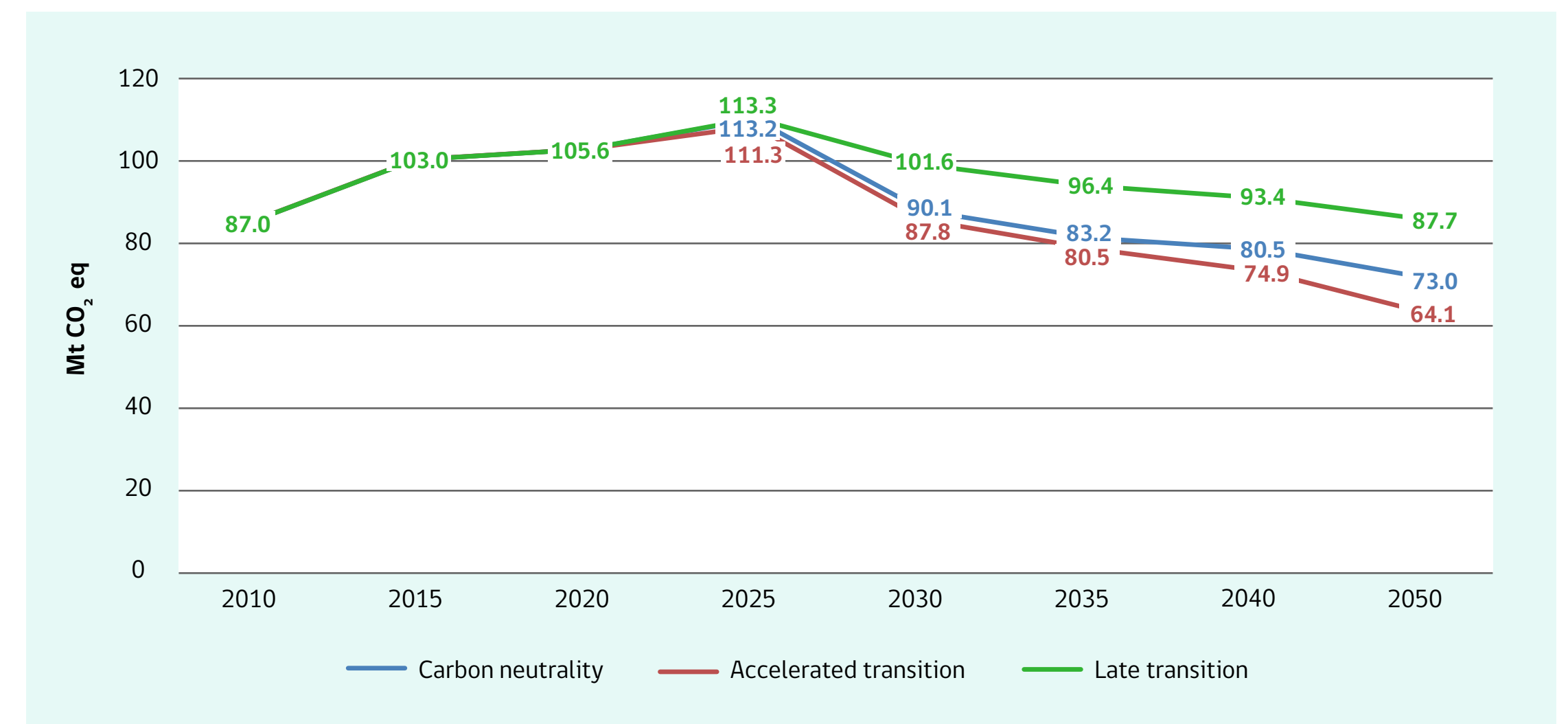
Projections System (SNP), an instrument defined in the LMCC. Although the SNP is still under development, it presents important advances that allow it to operate at present, with this publication, in a trial period. The future SNP will aim to facilitate and speed up the evaluation of prospective scenarios and GHG mitigation measures, installing the necessary capacities in the MMA and establishing a system of coordination and information transfer between the relevant agencies. For a more in-depth review of the SNP methodology, it is suggested to access the system's web page.¹⁷

Chapter 3 details the projected emissions for the 2050 carbon neutrality scenario (central or

carbon neutral scenario) and for two alternative scenarios (late transition scenario and accelerated transition scenario), resulting from the participatory process of the Ministry of Energy's Long-Term Energy Planning. These scenarios differ, based on their account, in the projection of macroeconomic variables, prices, technological changes and in the depth or scope with which GHG mitigation measures are proposed.

Below is a comparison of the GHG emissions trajectory in Mt CO₂ eq of the three scenarios - carbon neutral, accelerated transition and late transition - which corresponds to Figure 32 in Chapter 3.

Figure 32 in Chapter 3. Comparison of the three emission projection scenarios, 2010-2050 series



Source: National Projections System.

¹⁶ Available at https://energia.gob.cl/sites/default/files/documentos/pelp2023-2027_informe_preliminar.pdf

¹⁷ <https://cambioclimatico.mma.gob.cl/sistema-nacional-de-prospectiva-snpchile/introduccion-al-sistema/>

3.8. Monitoring, reporting and verification of mitigation measures

The country has excelled in the preparation of reports to comply with international requirements. However, the country faces the challenge of expanding and defining its MRV systems to improve the way in which reports are prepared, so that they can be done in a systematic manner, like the preparation of the National GHG Inventory. In this sense, Chapter 3 proposes a concept of a national MRV system for mitigation, analyzing the MRV systems or initiatives developed in the country that are currently in place, proposing an organized structure or scheme for them, proposing a definition and objectives for a future national MRV system for mitigation, and identifying those systems or initiatives related to the follow-up of the country's mitigation goals.

At the national level there are different MRV systems in operation, each of which has a structure and methodology that responds to its specific objectives. Thus, there are some systems aimed at MRV of GHG emissions and removals while others aim at MRV of GHG emission reductions from mitigation measures, some apply MRV at the level of specific projects and others at the level of policies and actions, some have an ex ante approach and others are ex post, among other aspects. Details are presented in Tables 42, 43 and 44 and Annex 4 of Chapter 3.

The Mitigation and Transparency department of the Climate Change Division (DCC) has overseen

the management of Chile's international mitigation MRV processes that account for the monitoring of national mitigation targets. This monitoring is done through various systems managed by both the MMA and other public institutions that are key collaborators in these processes (e.g., Ministry of Energy). Considering the existing MRV systems or initiatives and the mitigation targets presented in the NDC 2020, it is identified that the mitigation MRV systems or initiatives that may have a role in terms of tracking the two types of national targets (M1 and M2 mitigation targets and mitigation policies and actions), including both ex ante and ex post temporalities, are the National Projections System (SNP); the National Greenhouse Gas Inventory System in Chile (SNICHILE); Monitoring, Reporting and Verification (MRV) of Mitigation Policies and Actions¹⁸ (linked to the Sectoral Mitigation Plans).

4. Needs and International Support Received

4.1. Introduction

Chapter 4 provides relevant information on climate change needs in Chile, including the identification of existing barriers and gaps, and the international support received between 2020 and 2022 in this area, which are classified into areas (scopes) and dimensions. Consistent with what was reported in the Fourth BUR (MMA, 2020), the six scopes determined on that occasion are maintained:

Reporting (R), Mitigation (M), National Greenhouse Gas (GHG) Inventory, Adaptation (A), International Negotiation (N) and Transversal (T), and the three dimensions: Policy, Program and Project Financing (PPP), Technology Transfer (TT) and Capacity Building and Technical Assistance (CCA). The results of current needs, gaps and barriers for these areas are presented in Tables 1 to Table 13.

4.2. Needs, gaps, and barriers for climate action

Although the development of institutions and the generation of capacities related to climate change in Chile has shown substantive progress in recent years, through the creation and strengthening of the Inter-ministerial Technical Team on Climate Change (ETICC), it is still possible to identify needs, gaps, and barriers.

The ETICC has been a key player in the process of creating different national, regional, and sectoral public policies. The result of its work has been reflected in the updating of Chile's NDC, the preparation of Chile's Long-Term Climate Strategy (ECLP), and in the recently enacted Framework Law on Climate Change. It has also contributed to the preparation of the Fourth National Communication and the present Biennial Update Report.

The need for institutional capacities for the implementation of the commitments is highlighted, as well as the empowerment of stakeholders through knowledge and the design of enabling instruments, increasing the capacity to collect and

analyze data, develop indicators, and prepare reports, as well as improving the Monitoring, Reporting and Verification (MRV) systems that allow the follow-up of policies and their correct execution. It also requires the creation and strengthening of capacities for the formulation of projects that help to obtain financing or cofinancing for these actions, and the development of local capacities to meet the challenges of design, articulation, and implementation of climate management instruments (PSM, PSA, PARCC, PACCC) established in the LMCC, strengthening the management of Regional Governments and Municipalities.

The methodology applied for the collection and analysis of information on needs, gaps and barriers to climate action includes meetings with ETICC focal points, sending a form to each counterpart, contact with trade unions and private sector associations, and consolidation of the information collected (see details in Figure 1 of Chapter 4).

Regarding the analysis of public sector needs that were consulted in the 2020–2022 period, the diagnosis indicates that, of the total needs reported, in the 6 areas identified, 80% are distributed almost equally among the areas that correspond to the categories of Mitigation, Adaptation and Transversal, 9.6% correspond to the National GHG Inventory area and 0.4% are grouped in the areas of Reporting and International Negotiation. The dimensions consulted: 1) Capacity Building and Technical Assistance (CCA); 2) Financing of Policies, Programs and Projects (PPP); and 3) Technology

¹⁸ The document "Definition of guidelines for the national system of Monitoring, Reporting and Verification (MRV) of mitigation policies and actions promoted by the public sector" presents a first approach to the methodology for ex-post follow-up of mitigation policies and actions, considering roles and responsibilities.

Transfer (TT) are associated with their corresponding Means of Implementation Strategies recognized in the Framework Law on Climate Change and in the Long-Term Climate Strategy 2050, which represents a key opportunity for the action plans associated with these strategies to prioritize and address them.

In Chile, the private sector has had an important participation both in investment and in the implementation of innovative climate change mitigation measures. Although in terms of adaptation to climate change, its participation is incipient, currently the private sector is closer to climate change and has taken the initiative in certain matters, in some cases committing to the SDG or being part of the alignment of common objectives by the sector that are reflected in the document of the Chilean Institute for the Rational Business Administration (ICARE), delivered at the National Business Meeting (ENADE). Table 14 of the chapter shows the identified needs of this sector.

4.3. Support for climate action

The support received by Chile during the period 2020 to 2022 amounts to USD 36,518,716, which is distributed mainly in Financing Policies, Programs and Projects, representing 63% of the total; also, in Capacity Building and Technical Assistance with 34% and in Technology Transfer plus the support received for the preparation of national reports and communications, which represent 3% of the total.

Regarding the support received in the 2020-2022 period, Chapter 4 provides information on the following areas: support for the preparation and publication of national communications; international support received for climate change related activities; support received for Financing Policies, Programs and Projects (FPPP); support received for Capacity Building and Technical Assistance; support received for Technology Transfer.

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