



# Chile

## Independent regional climate change assessment

### Key opportunities for climate ambition and implementation



» The capacity to adapt to climate change must be strengthened by promoting research and innovation, investing in quality public services accessible to the entire population, and promoting accessible information on the impacts of the climate crisis.

» Greenhouse gas emissions must be reduced by reducing dependence on fossil fuels and promoting a just transition to renewable and efficient energies, electrification of transportation and sustainable waste management.

» To reduce climate finance gaps, progressive and green fiscal frameworks provide an opportunity to mobilize resources to invest in climate mitigation and adaptation actions.

The effects of the climate crisis, the rise in temperature, the decrease in precipitation and an increase in the frequency of extreme weather events, jeopardize people's fundamental rights, including the right to life, health, water, food and housing. It is essential to advance a just transition to renewable energies and invest in climate adaptation that improve the living conditions of the population and combat the root causes of climate change.



### Climate Justice

### Climate policy instruments

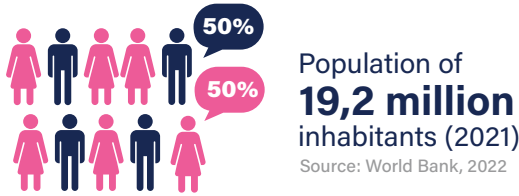
In compliance with the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, countries parties have developed regulatory instruments, institutional and budgetary arrangements to address the effects of climate change at the national level. The following is a list of some of the instruments that frame climate action in Chile.

<b>NDC</b>	1st NDC (2015) Updated NDC (2020) Annex strengthening commitment (2022).
<b>Target 2030 y 2050</b>	2030 non-conditional target, not to exceed 95 MtCO <sub>2</sub> e 2050 target, to achieve net zero emissions
<b>BUR</b>	5 Biennial Update Report, (2014, 2017, 2017, 2018, 2021, 2022)
<b>LTS</b>	Long Term Climate Strategy (LTCS) 2021.
<b>CN</b>	4 national communications (1999, 2011, 2016, 2021)
<b>PNA</b>	National Climate Change Adaptation Plan, 2014 - Updated (PANCC 2017-2022)
<b>Laws relevant to climate change</b>	<ul style="list-style-type: none"> <li>- Framework Law on Climate Change 2022. NO. 21,455.</li> <li>- Law 19,300 on General Bases of the Environment</li> <li>- Law 20,780 (tax reform implementing a green tax)</li> <li>- Law No. 20571 on Environmental Taxation (Carbon Tax)</li> <li>- Law No. 19,657 on Geothermal Energy and its Regulation by Decree 114.</li> <li>- Law No. 20,257 on Non-Conventional Renewable Energies</li> </ul>

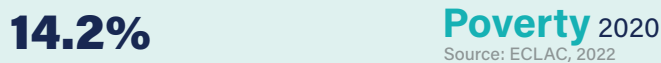
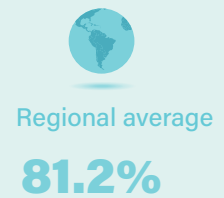


# Chile

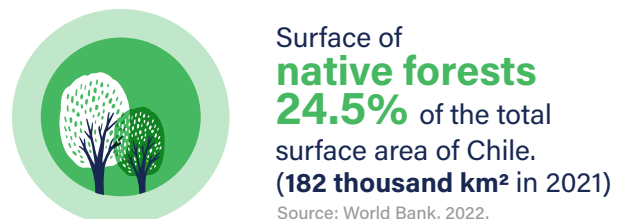
## Context



### SOCIOECONOMIC



### HABITAT AND ENVIRONMENT





# Chile

## Adaptation and vulnerability

With the signing of the Paris Agreement, the parties committed to increase capacity to adapt to the adverse effects of climate change and build climate resilience, as well as to promote low-GHG development.



### CONTEXT

The impacts of climate change greatly affect vulnerable populations who face a lack of resources, limited access to public services and restricted possibilities to make decisions to mitigate the adverse effects of disruptions in the climate system.



### KEY OPPORTUNITIES

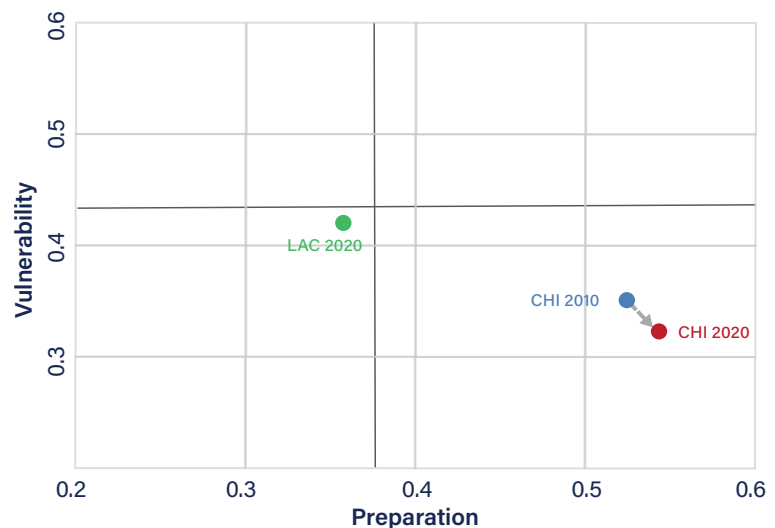
It is essential to ensure access to accurate and timely information on the risks faced by different groups, particularly those in structural conditions of marginalization, to ensure that they develop resilience mechanisms in the face of climate emergencies.

### 3.1 Vulnerability and preparedness

According to the methodology developed by the University of Notre Dame (ND-GAIN Country Index<sup>1</sup>) to establish the degree of vulnerability of countries in relation to their degree of preparedness, Chile shows low levels of vulnerability and high levels of preparedness, however, it has not presented major advances in its level of preparedness from 2010 to the present.

The green dot indicates the average vulnerability and preparedness for the 15 LAC countries analyzed in this report and represents that they are highly vulnerable and lack adequate preparedness to meet adaptation needs.

Figure 1. Comparative resilience 2010-2020.



Source: Prepared by the authors based on ND-GAIN, 2023.

<sup>1</sup> The ND-GAIN country index summarizes a country's vulnerability to climate change and other global challenges combined with its preparedness to improve resilience. It aims to help governments, businesses and communities better prioritize investments for a more efficient response to the immediate global challenges ahead. According to this methodology, vulnerability measures a country's exposure, sensitivity and adaptive capacity to the negative effects of climate change, considering six life-supporting sectors: food, water, health, ecosystem services, human habitat and infrastructure. On the other hand, preparedness measures a country's capacity to leverage investments and convert them into adaptation actions, considering three components: economic preparedness, governance preparedness and social preparedness.

The vertical axis shows the vulnerability value, and the horizontal axis shows the country's preparedness value. The graph is divided into four quadrangles delimited by the value of the medians of vulnerability and preparedness consider-

red the values for vulnerability and preparedness for the set of countries analyzed by ND GAIN. The index ranges from 0 (low preparedness/vulnerability) to 1 (high preparedness/vulnerability).

**Figure 2. Examples of changes observed in Chile.**



The average temperature shows an increase of more than 1°C for the period 2009-2019.

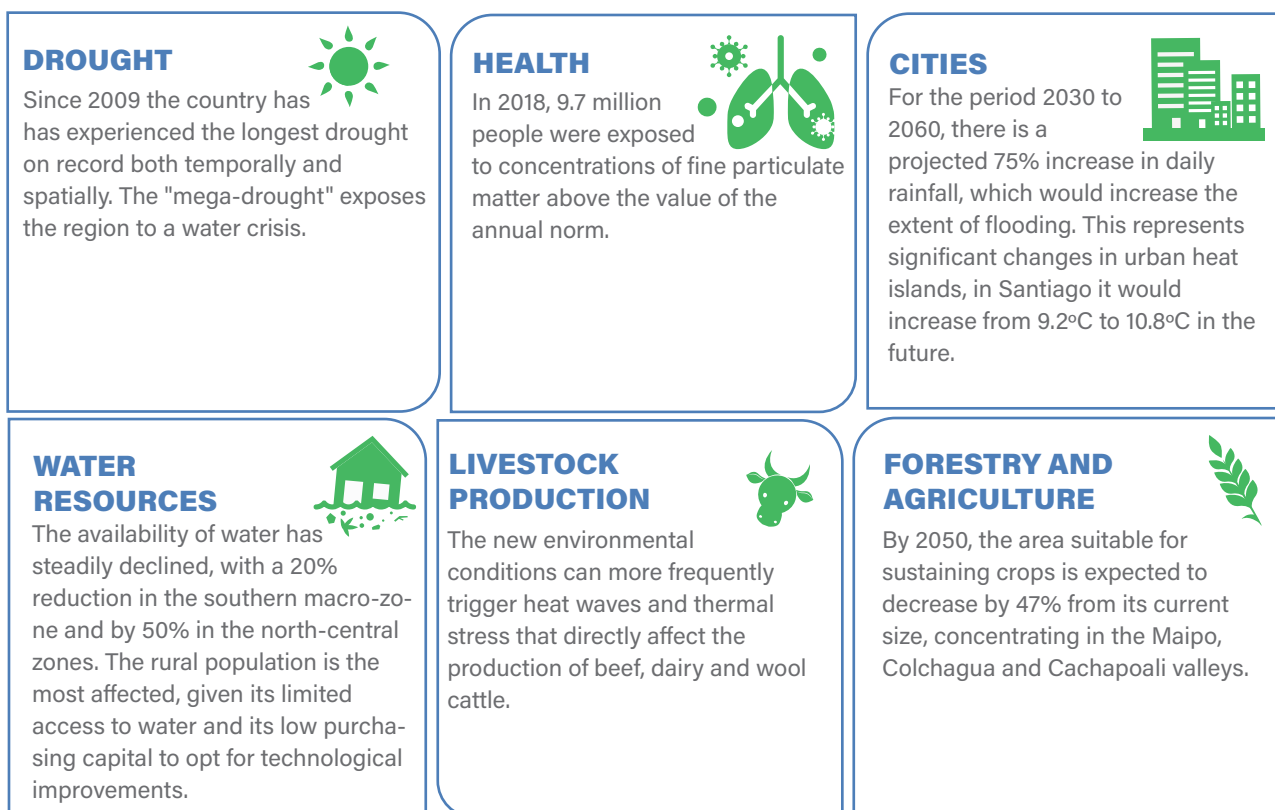


Annual precipitation shows a decreasing trend of 7% per year (2009-2019), with variation depending on the location; the central zone of the country shows the highest drying trend, with 14% per decade.

Sources: 4CN, 2021; NDC, 2021.

As a country highly vulnerable to climate change, it is estimated that in Chile, environmental, social and economic losses by these phenomena could become significant, reaching 1.1% of GDP per year by 2100 (ECLAC, 2012) (PANCC, 2017).


**Figure 3. Projected impacts.**






Sources: NDC,2020; OMM, 2021; 4CN, 2021; Porter et al., 2014.

### 3.2 3.2 Adaptation policies and measures

**Table 1.** Sectors with adaptation measures according to Chile's Nationally Determined Contribution (NDC) Updated 2020.

Sectors	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
 <p>Institutional/ Sectoral plans</p>	<p>A1) By 2021, the objective, scope, goals and elements that will make up the adaptation component in Chile's Long term Climate Strategy (ECLP, Spanish acronym) will be defined, ensuring a participatory process that involves various stakeholders from different territorial scales.</p>	<p>Measure fully implemented. Between May 2020 and April 2021, an early participation process was carried out. The formal citizen consultation process began in 2021. The ECLP was approved in October 2021 and presented at COP26. The instrument establishes guidelines and objectives at the sectoral and territorial levels, with reporting, verification and evaluation indicators.</p>
	<p>A2) Climate action will be strengthened at the national level through the adaptation plan for 11 prioritized sectors, incorporating the lessons learned from the implementation of the initial plans. These will be inputs for the Adaptation Communication, to be submitted no later than 2022 to the UNFCCC.</p>	<p>Measure in early implementation. To date there are 6 sectoral adaptation plans (forestry, agriculture, biodiversity, aquaculture, health, infrastructure and cities), but none have been updated since the entry into force of the Framework Law on Climate Change or the ECLP. There is a preliminary draft for the energy sector, and plans for water resources, coastal zones, mining and transportation are in the process of being prepared. Chile's First Adaptation Communication was sent in December 2022.</p>
	<p>A3) By 2025, capacities and climate change institutions will have been strengthened at the regional level, along with the implementation of adaptation, mitigation, and necessary means of implementation, through regional climate change action plans (PARCC, Spanish acronym) in 10 regions of the country. By 2030, all 16 regions of the country will be equipped with this instrument.</p>	<p>Measure in early implementation. To date, four draft PARCCs (Atacama, O'Higgins, Los Ríos and Los Lagos Regions) have been prepared and submitted for public consultation. The PARCCs were prepared with financial support from the Green Climate Fund. Plans are being prepared for Antofagasta and Magallanes (with EUROCLIMA+ funds), Coquimbo and Aysén (with funds from the Ministry of the Environment) and La Araucanía (with funds from the Competitiveness Innovation Funds).</p>
	<p>A6) Strengthening the inclusion of non-governmental actors during the period of implementation of the NDC and in the planning and implementation of adaptation instruments. In particular, the following climate actions will be developed:</p>	<p>There is no public information on the progress of this measure. The Adaptation Communication states that the PNACC update will work with the private sector to define a roadmap and methods of cooperation. On the other hand, there is a proposal for a Capacity Building and Climate Empowerment Strategy (ACE), which has been submitted for public consultation but has not yet entered into force.</p>

	<p><b>Water resource/ Water and sanitation</b></p>	<p><b>A7) The country's information and management mechanisms for addressing climate change impacts on water will be enhanced to increase their resilience.</b></p>	<p>There is no public information on the progress of this measure. The Framework Law on Climate Change establishes the mandate to develop Strategic Plans for Water Resources in Watersheds, but there are no reports on their development or progress.</p>
		<p><b>A2.a) By 2021, a climate risk map platform for continental Chile will have been developed at the national level.</b></p>	<p>Measure in early implementation. The Climate Risk Atlas (ARCLIM) has been developed. However, the map focuses on sectoral levels rather than the territorial-communal level, and an estimate of the costs of inaction is included in the ECLP.</p>
		<p><b>A2.b) As of 2021, a cost estimate will be made for the inaction associated with climate change, and by 2025, an estimate of costs for historical losses and damages will be made along the same lines.</b></p>	<p>Regarding the 2025 objectives, there is no public information on progress. The Adaptation Communication states that the National Adaptation Plan Update will include an assessment of the vulnerability of indigenous peoples.</p>
		<p><b>A2.c) By 2025, climate change risk assessments will have been conducted for vulnerable groups in the country, with a special focus on indigenous peoples, poverty, and gender.</b></p>	
	<p><b>Risk management</b></p>	<p><b>A4) Existing studies and analysis of vulnerability and risks of the country will be deepened and updated considering the approach of gender, to address the threats.</b></p>	<p>Measurement in medium implementation. The Climate Risk Atlas (ARCLim) makes risks visible but does not yet consider a disaggregation of impacts considering a gender approach.</p>
		<p><b>A8) Strengthen the capacity to adapt to climate-related risks and the capacity to manage the adverse effects caused by socio-natural disasters in the country.</b></p>	<p>Measure in early implementation. A proposed guide for human mobility in the context of climate change and disasters was prepared. Data is currently being collected on areas with high water stress and precarious settlements. Progress has been made in developing the Annex of the National Emergency Plan to address "High temperatures and extreme high temperatures" and in implementing the National Policy for Disaster Risk Reduction 2019-2030. However, no progress has been reported regarding the Regional Disaster Risk Reduction Plans.</p>
	<p><b>Evaluation and monitoring</b></p>	<p><b>A5) By 2026, the current evaluation and monitoring system will have been strengthened through progress indicators and impact for all adaptation instruments, which will allow to evaluate the progress and fulfillment of the established goals.</b></p>	<p>Measure in early implementation. The Adaptation Communication notes that through a study conducted under Chile's Capacity Building Initiative for Transparency (CCG, 2022) 11 ARCLim impact chains were complemented incorporating adaptive capacity indicators. Similarly, 21 intersectoral vulnerability indicators were developed. Additionally, progress has been made in developing gender-sensitive indicators under the Gender and Climate Change Project (DEUMAN, 2022). Finally, the update of the PNACC will include the development of a digital monitoring and reporting system.</p>



# Chile

## Mitigation

With the signing of the Paris Agreement, the parties committed to keep the global average temperature increase well below 2°C pre-industrial levels and to continue efforts to limit it to 1.5°C.



### CONTEXT

Although greenhouse gas (GHG) emissions in Chile have increased fivefold in the past 30 years, Chile is responsible for only 0.2% of global emissions.



### KEY OPPORTUNITIES

Increasing the share of renewable energies in Chile's energy matrix is essential not only to decarbonize the economy, but also to ensure the long-term viability of the energy system and prevent the country's energy demand from contributing to climate change.

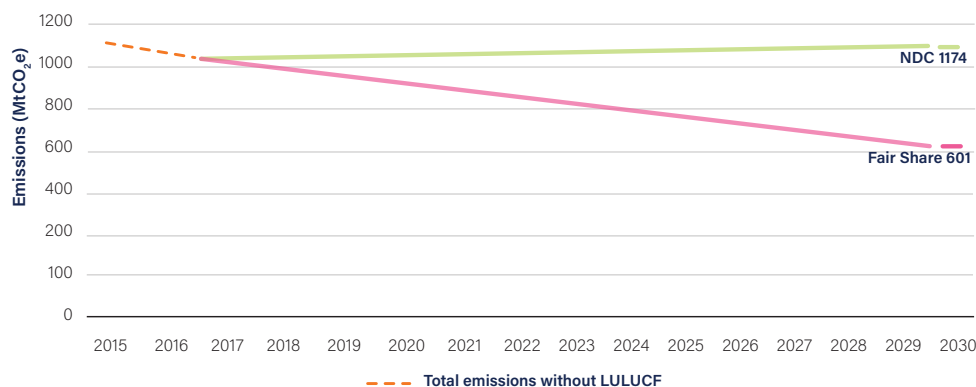
### 4.1 Country contribution to emissions

Chile's latest total annual emissions were 109.46 MtCO<sub>2e</sub> in 2018, and 57.88 MtCO<sub>2e</sub> if emissions from land uses (LULUCF) are not considered (MMA, 2022).

In the latest update of its NDC, Chile commits not to exceed 95 MtCO<sub>2e</sub> annually by 2030, this means a 13% reduction in total emissions compared to 2018.

Whereas, considering the fair contribution for Chile (Fair Share)<sup>2</sup>, according to the Stockholm Environment Institute Calculator (SEI, 2023), the country should reduce its emissions 48 MtCO<sub>2e</sub> by 2030 (without considering LULUCF). This implies a 14% reduction compared to emissions in 2018.

Figure 4. Chile's NDC target and fair share without LULUCF.

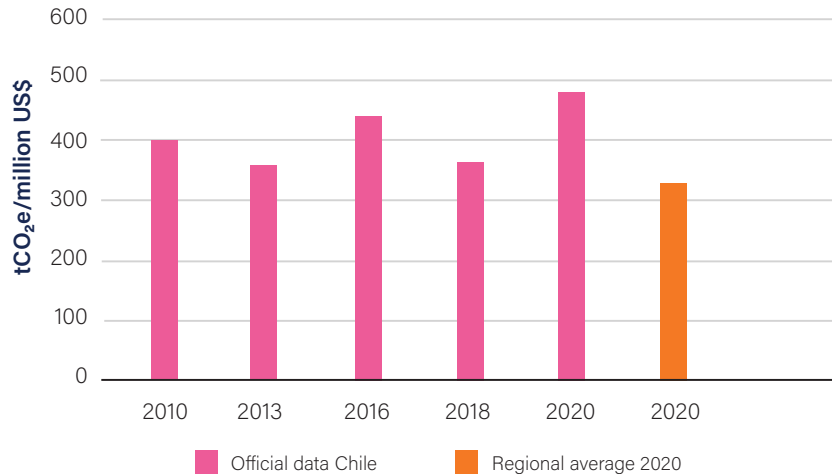


Source: Prepared by the authors based on MMA, 2021; NDC, 2021; SEI, 2023.

Emissions intensity data for Chile's economy quantifies the energy used per million dollars (USD) and is closely related to the level of decarbonization, efficiency achievements, climate

conditions, or geography. Looking at official data for Chile, the emissions intensity of the economy increased by 22% between 2010 and 2020 (MMA, 2022).

**Figure 5. Carbon intensity of the economy (tCO<sub>2</sub>e / millionUSD\$).**



Source: Prepared by the authors based on MMA, 2022.

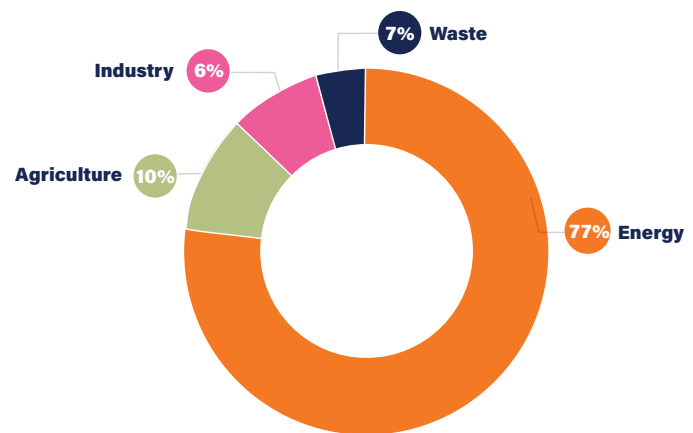
## 4.2 Emissions by sector

77% of the country's emissions come from the energy sector, while 10% from agriculture, 6% from industry and the remaining 7% from waste (MMA, 2022) (Figure 6).

### Energía

Chile's fossil fuel reserves (oil and coal) do not represent a significant percentage of the total reserves of Latin America and the Caribbean in terms of energy (OLADE, 2022; BP, 2022; Our World In Data, 2022).

**Figura 6. Total emissions by sector 2020**

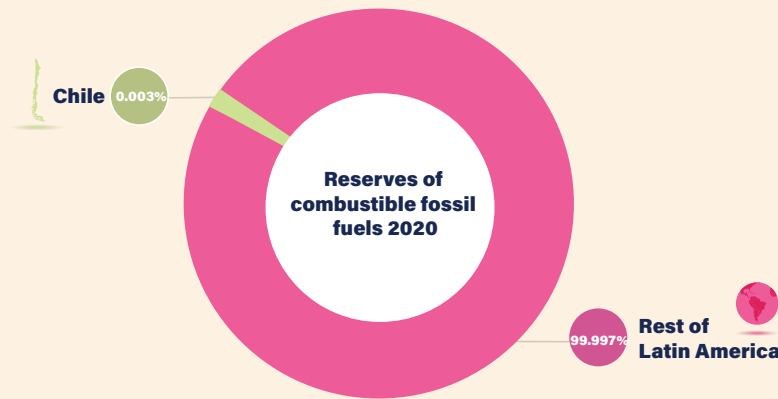


Source: Own elaboration based on MMA, 2022.

2 The Fair Share represents the fraction of emissions that each country should emit at most (in this case by 2030) in order not to exceed the 1.5°C average global temperature increase. There are various methodologies for calculating the fair share, the following is used here developed by the SEI, because it provides information for all Latin American and Caribbean countries. Considerations used for the calculation (SEI): Historical responsibility: since 1850, Mitigation pathway: 1.5°C standard (excl USCUS), Capacity: \$0 development threshold, 50% Responsibility - 50% Capacity.

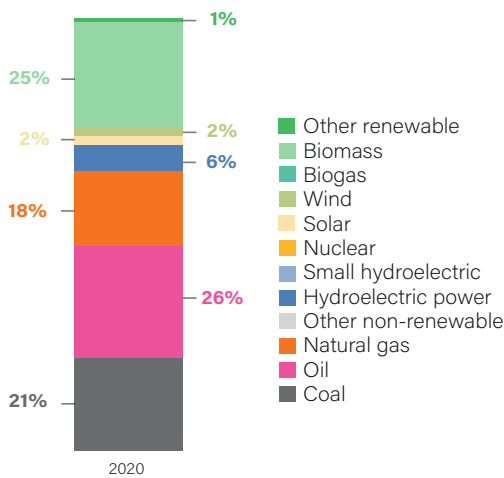


Figure 7. Chile's fossil fuel reserves and its share of total reserves in LAC<sup>3</sup>



Source: Prepared by the authors based on OLADE, 2022; British Petroleum, 2022; Our World in Data, 2022.

Figure 8. 2020 primary energy matrix

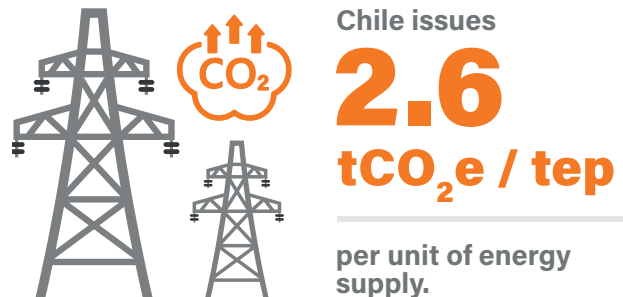


The primary energy matrix presents a majority share of fossil fuels (67% in 2021) like the percentage of the region (66% in 2021) (OLADE 2022; IEA 2022). Despite this, there has been a steady increase in renewable energies in the last decade.

Source: Prepared by the authors based on BEN, 2020. This matrix shows primary energy resources; if the country imports secondary fuels, these will be reflected in the sector's emissions, but not in this primary energy matrix.

Figure 9. Carbon intensity of Chile.

Carbon intensity indicates how much CO<sub>2</sub> is emitted per unit of energy supply. Chile 2.6 tCO<sub>2</sub>e / tep in 2021.

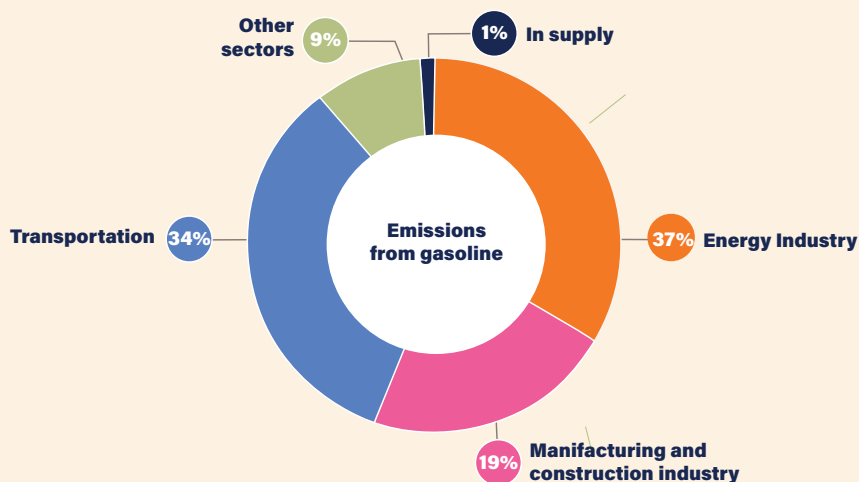


Source: OLADE, 2022; EDGAR, 2022.

<sup>3</sup> For the conversion to energy units of fossil fuel reserves, the lower calorific values given by OLADE as a reference in its publication Manual De Estadísticas Energéticas, OLADE 2011 were used.

Emissions from the energy sector have shown a slight increase between 2010 and 2019, and then decrease in 2020 coinciding with the COVID19 pandemic, presenting a constant situation until 2021. The energy industry is the subsector that contributes most to emissions in this sector with a 41% share in 2021, followed by the transportation subsector with 33%.

Figure 10. Energy sector emissions by subsector 2018.



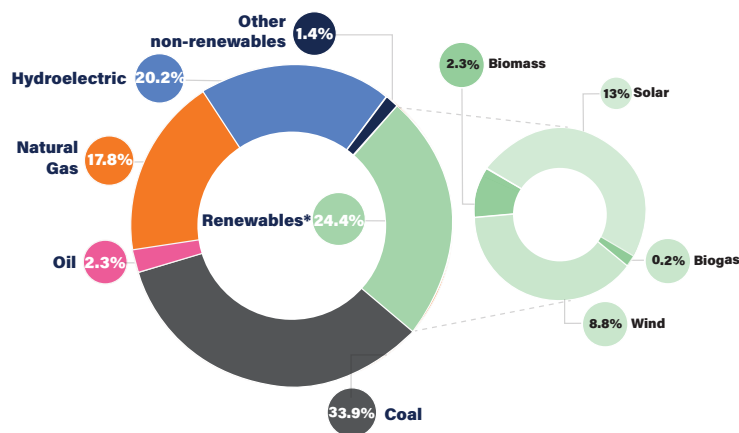
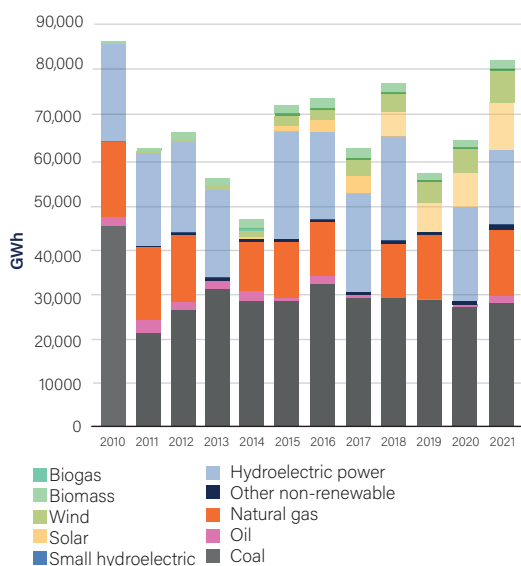
Source: Own elaboration based on MMA, 2022.

## Power generation

The share of renewable energies in the electricity matrix has been increasing over the last decade from 4% in 2010 to 24% in 2020.

Within the 24% of electricity generation from renewable sources achieved in 2020, 13% was from solar energy, 8% from wind energy, another 2.3% from biomass and a smaller share from biogas.

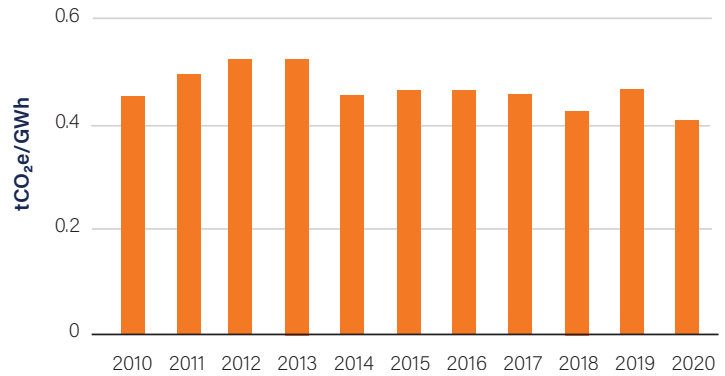
Figure 11. Electricity generation matrix 2010-2021 and percentages of participation of each technology in 2021.



Source: Prepared by the authors based on official data from Chile, CNE,

The emissions intensity of electricity generation has decreased by 11% in the period 2010-2020 due to the gradual incorporation of renewable energies into the matrix (EDGAR, 2022; IRENA, 2022).

**Figure 12. Carbon intensity of electric power generation (ktCO<sub>2</sub>e/GWh).**

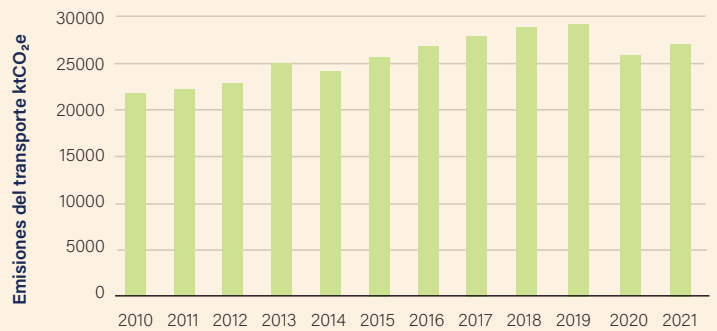


Source: own elaboration based on EDGAR, 2022; IRENA, 2022.

## Transportation

Emissions from the transportation sector have increased by 24% in the last decade, showing a decrease coinciding with the COVID19 pandemic.

**Figure 13. Transportation Emissions 2010-2021.**

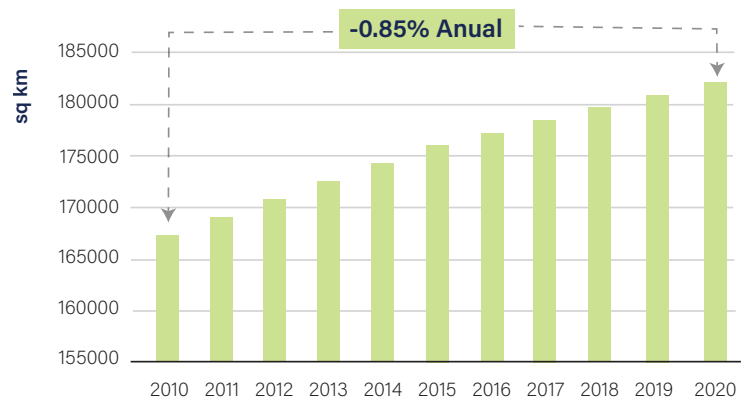


Source: Prepared by the authors based on EDGAR, 2022.

## Agriculture, Forestry and Other Land Use (AFOLU)

Forested land in Chile has experienced a continuous increase in the last decade (2010-2020) at an average annual rate of 0.85%, which is equivalent to approximately 148 thousand hectares per year, in contrast to the regional level where the area of native forests has decreased at a rate of 0.3% per year during the same period (World Bank, 2022).

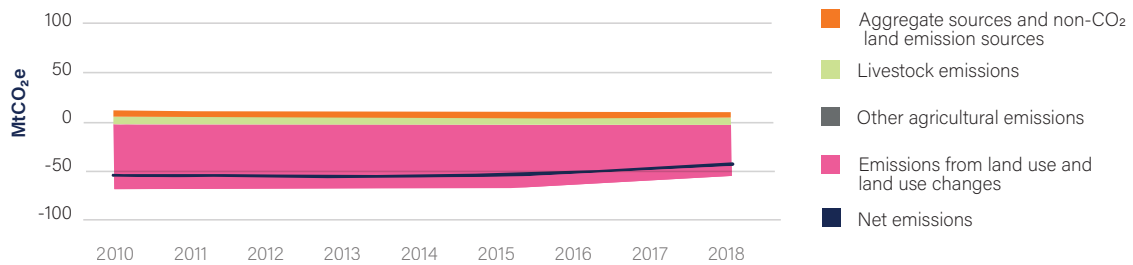
**Figure 14. Area of native forests in Chile and average annual loss rates.**



Source: Own elaboration based on World Bank, 2022.

This sustained reclamation of forest land has generated an increase in carbon sequestration resulting in negative total emissions from the Agriculture, Forestry and other land use sectors.



Figure 15. AFOLU emissions by subsector.



Source: Own elaboration based on EDGAR, 2022; FAO, 2022.

### 4.3 Mitigation policies and measures

Table 2. Mitigation measures for the energy and transportation sector established in the NDC 2020.

Sector	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
 <b>Energy (Retirement of power plants)</b>	<b>Renewable energies to replace thermal power plants (Retirement of 5,500 MW by 2040)</b>	Measure in advanced implementation. In 2019, as part of their commitments to COP25, the Government of Chile and the 4 companies that own the 28 coal-fired thermoelectric plants presented a voluntary commitment to decarbonization and a schedule the retirement of 8 coal-fired plants per year, the "Plan de Descarbonización de la Matriz Energética al 2040" (Decarbonization Plan for the Energy Matrix by 2040). The Climate Change Framework Law (2022) established the State's obligation to achieve carbon neutrality by 2050. The Decarbonization Plan began with the closure of the Tocopilla U12 and U13 and Tarapacá units in 2019, continued in 2020 with the closure of the Bocamina I and Ventanas I plants, and in 2022 the Tocopilla U14 and U15 plants, and the Bocamina II plant. In June 2023, 20 coal-fired thermoelectric units are still operating in the country, with a capacity of 4,327 MW, 30% of the country's electricity generation. The Ventanas II plant in Puchuncaví is due to close since the end of 2022.
 <b>Energy (Sustainable buildings)</b>	<b>Promotion of energy renovation of housing (57% of housing heating systems with electricity by 2050)</b>	Measure in intermediate implementation. The State has introduced an Energy Efficiency Law and a National Energy Efficiency Plan, which includes efficient residential energy use. This plan incorporates energy efficiency labels into the energy qualifications or prequalification process, a requirement for the final acceptance of residential projects. Additionally, an energy efficiency roundtable for buildings has been established. The Ministry of Energy published the National Heat and Cooling Strategy, aiming for 80% of energy use by 2050 to be allocated to sustainable heating and cooling. Specifically, the strategy proposes that 75% of residents meet their heating and cooling needs sustainably and that greenhouse gas emissions from heat and electricity generation be reduced by 65%. Finally, the Casa Solar Program facilitates the purchase of photovoltaic systems at reduced costs, with variable state co-financing for homes up to 3,000 UF. Despite the range of projects underway, there is limited information available on the percentage increase in the number of homes heated with electricity.
	<b>Solar thermal systems - residential and public (52% of used in homes and 10% in hospitals).</b>	Measure in intermediate implementation. To date, the existence of the Solar House Program and the Public Solar Roofs Program are recognized as initiatives that seek to comply with this measure. The Public Solar Roofs Program has approximately 133 projects benefited, with documentation to prove the estimated annual savings and GHG reduction. No information is available that has an updated report available on progress against this target.



**Distributed generation (1,800 GWh in residential and 5,657 GWh in commercial by 2050)**

Measure in early implementation. There is a list of generation facilities that have been registered with the Superintendency of Energy, part of the Superintendency of Electricity and Combustibles (SEC), shows more than 18,000 projects from 2015 to 2023. The Energy Policy 2050, in its 2022 update, sets cross-cutting goals for distributed generation by 2050 but does not specify detailed compliance indicators. Nevertheless, the preliminary Long-Term Energy Planning report indicates favorable results since 2020, with even more promising projections for 2030 and 2050. The publication of a National Distributed Generation Strategy, expected in 2023, will define explicit integration goals at the national level, including residential, industrial, and commercial segments. However, distributed generation goals are not prominently featured in more specific energy transition policies, such as those for Lithium and Green Hydrogen. Instead, there is a focus on developing large energy generation hubs in the Antofagasta and Magallanes regions.

**Thermal retrofitting in vulnerable dwellings (20,000 dwellings per year)**

Measure in early implementation. The Ministry of the Environment has identified subsidies for home refurbishment, which residents must apply for through a sponsoring entity accredited by the Ministry of Housing, and after meeting a prior savings requirement. While this policy does not require a social protection card, it gives preference to families with a social registry of households who fall within the lowest 60% of the country's socioeconomic classification. Additionally, guides and tutorials to raise awareness about the importance of thermal conditioning for housing units are available. However, there is no information on the progress towards meeting the goal.

**Minimum Energy Efficiency Standards (MEPS)**

Measure with early implementation. The Energy Efficiency Law and Plan 2022-2026 establishes a measure to upgrade and expand Minimum Energy Performance Standards (MEPS) for devices, set to be implemented starting in 2023. Currently, there is no additional information available on the progress of this measure.

**Public and commercial electric heating**

There is no information available on the implementation of the measure.

**Geothermal energy (35 GWh at the national level, maintained until 2050)**

There is no information available on the implementation of the measure.

**District heating (0.2% in consumption matrix)**

Measure in early implementation. The Ministry of Energy and the Ministry of Environment have recognized the existence of studies and evaluations of district energy projects, primarily conducted in 2019. Additionally, a District Energy Project Development Manual was published in 2018. No further information is available regarding compliance with this measure.







**100% electric cabs (until 2050)**

Measure in intermediate implementation. The Ministry of Energy's My Electric Taxi program aims to promote electromobility in light transportation by replacing internal combustion vehicles with 100% electric technology. In its first phase, the program successfully replaced 50 vehicles in Santiago. In its second phase, it offers benefits for 80 basic, executive, or taxicabs. The program will be extended to the regions of Valparaíso, Biobío, La Araucanía, Los Ríos, and Aysén. Users must apply to participate in the program. However, there is no information on the percentage of cabs converted, the number of cabs that have been converted, or the current number of cabs in circulation.



**Public Transportation - Metropolitan Region (100% of buses by 2040)**

Measure in intermediate implementation. The Ministry of Transport and Telecommunications developed a management model that successfully introduced the first 200 electric buses into operation in the capital. By 2020, the supply had increased to over 650 units, representing 10% of the fleet of the RED Metropolitan system.

 <b>Transportation</b>	<b>Public transportation – Regional (100% of buses by 2040)</b>	Measure in early implementation. The benefits of electric bus programs have been concentrated exclusively in the Metropolitan Region. However, in 2023, the first electric buses arrived in the Antofagasta Region, consisting of a fleet of 40 fully electric buses. It is projected that additional regions, such as Valparaíso and Talca, will receive electric bus fleets in the coming years, although administrative delays have been identified.
	<b>Private vehicles 60% by 2050.</b>	Measure pending implementation. While there is visibility of cases and best practices, there are no specific policies in place to ensure compliance with this measure, nor is there clear information available for the evaluation of compliance or progress indicators
	<b>Commercial vehicles 60% by 2050.</b>	Measure pending implementation. While there is visibility of cases and best practices, there are no specific policies in place to ensure compliance with this measure, nor is there clear information available for the evaluation of compliance or progress indicators
	<b>Modal shift in transportation (Decrease in private motorized transportation by switching to buses and bicycles)</b>	Measure pending implementation. While there is visibility of cases and best practices, there are no specific policies in place to ensure compliance with this measure, nor is there clear information available for the evaluation of compliance or progress indicators
 <b>Energy (Hydrogen)</b>	<b>Freight transportation (71% of freight transportation by 2050)</b>	Measure in early implementation. At the end of 2020, the State published the National Green Hydrogen Strategy to position Chile in the hydrogen market and set a goal to produce the cheapest hydrogen globally by 2030. Various agreements, memorandums, and conventions have been signed to secure international financing for hydrogen projects. However, local communities and environmental organizations have raised concerns about the environmental risks associated with the scale, magnitude, and time frame of these goals. The current government has not made significant changes to the strategy developed by the previous administration and is now working on the Green Hydrogen Action Plan. This plan aims to establish more specific conditions for the development of the Green Hydrogen roadmap, though there is no current roadmap for demand. A major criticism of the current green hydrogen projects is their focus on export development and economic benefit rather than addressing domestic challenges related to energy poverty, decarbonization, and carbon neutrality.
	<b>Motor usage in industry and mining (12% in motor applications in industry and mining by 2050)</b>	
	<b>Thermal uses via gas pipelines (7% in homes and 2% in industry by 2050)</b>	
 <b>Energy (Industry)</b>	<b>Solar thermal systems - Industry and mining (10% of thermal used in industry and 16% in copper mining)</b>	Measure with pending implementation. While there is visibility of cases and best practices, there are no specific policies in place to ensure compliance with this measure, nor is there clear information available for the evaluation of compliance or progress indicators.
	<b>Biogas generation (New sanitary landfills with power plants)</b>	Measure with early implementation. Although no specific policies aimed at meeting the target have been identified, the development of tools to facilitate biogas projects is recognized. This includes the 2022 publication of the Guide for the Development of Biogas Projects and the inclusion of biomass and biogas power generation plants in the Environmental Impact Assessment System (SEIA). There are also specific projects promoting biogas in the agricultural sector. However, there is no information available to evaluate compliance or progress indicators. Additionally, there is an overlap with other commitments related to waste management.
	<b>Thermal electrification (additional 25% for industrial and mining thermal uses)</b>	Measure with pending implementation. While there is visibility of cases and best practices, there are no specific policies in place to ensure compliance with this measure, nor is there clear information available for the evaluation of compliance or progress indicators.

 <b>Energy (Industry)</b>	<b>Energy Management System (Annual Saving in steps (0,6% a 2,5%))</b>	Measure in early implementation. The Energy Efficiency Law mandates that all large companies with an annual end-use energy consumption exceeding 50 tera-calories will be designated as Energy Management Capable Consumers. These companies must implement one or more "Energy Management Systems" that cover at least 80% of their total energy consumption. Once implemented, they are required to annually report to the Ministry of Energy and the Superintendency of Electricity and Fuels on identified opportunities, energy efficiency actions undertaken, and future plans. The Superintendency is responsible for oversight and potential sanctions. Despite this progress, there is no available information on compliance or progress indicators for the specific goal.
	<b>Minimum energy efficiency standards (MEPS) Engines up to 100HP (full replacement by 2030)</b>	Measure in early implementation. The Energy Efficiency Law and the Energy Efficiency Plan aim to incentivize the commercialization of more efficient vehicles through the application of minimum standards. This measure will be implemented starting in 2024 for light vehicles and will later extend to medium and heavy vehicles. However, there is currently no clarity on the specific mechanisms and instruments for providing these incentives.

**Table 3.** Sectors with mitigation measures for the Agriculture, Forestry and Other Land Use sector.

Sector	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
 <b>Waste</b>	<b>Capture or use of biogas from landfills (100% of the urban domestic waste deposited in landfills with landfill systems emissions from burning or biogas usage by 2035)</b>	Although no specific policies have been identified to meet the goal, the development of tools to facilitate biogas projects is recognized. This includes the 2022 publication of the Guide for the Description of Biomass and Biogas Power Generation Plants in the Environmental Impact Assessment System. Additionally, there are specific projects promoting biogas in the agricultural sector. However, there is no information available for evaluating compliance or progress indicators. Furthermore, there is an overlap with other waste-related commitments.
	<b>Usage of sewage treatment plant sludge, such as forest bio stabilizer</b>	The measure proposed new treatment plants in Gran Concepción and Gran Valparaíso, with methane management and sludge use by 2035. There is no information available on the implementation of this measure.
 <b>Agriculture</b>	<b>Pig slurry biodigesters (Population of pork waste to biodigesters, horizon to be defined)</b>	Measure pending implementation. Although there is visibility of cases and good practices, there are no specific policies for the fulfillment of this measure. The information available for the evaluation of compliance or progress indicators is not clear.

**Source:** own elaboration based on the methodological document "Chilean NDC Mitigation Proposal: Methodological approach and supporting ambition" (2019), and the Table of NDC measures allocations of the Long Term Climate Strategy.



# Chile

## Financing

Under the Paris Agreement, the Parties committed to financial flows consistent with a scenario towards low GHG emissions and resilient climate development.



### CONTEXT

Chile requires an unprecedented mobilization of resources to invest in climate mitigation and adaptation measures that address the needs of the populations most vulnerable to the impacts of the climate crisis in the country.



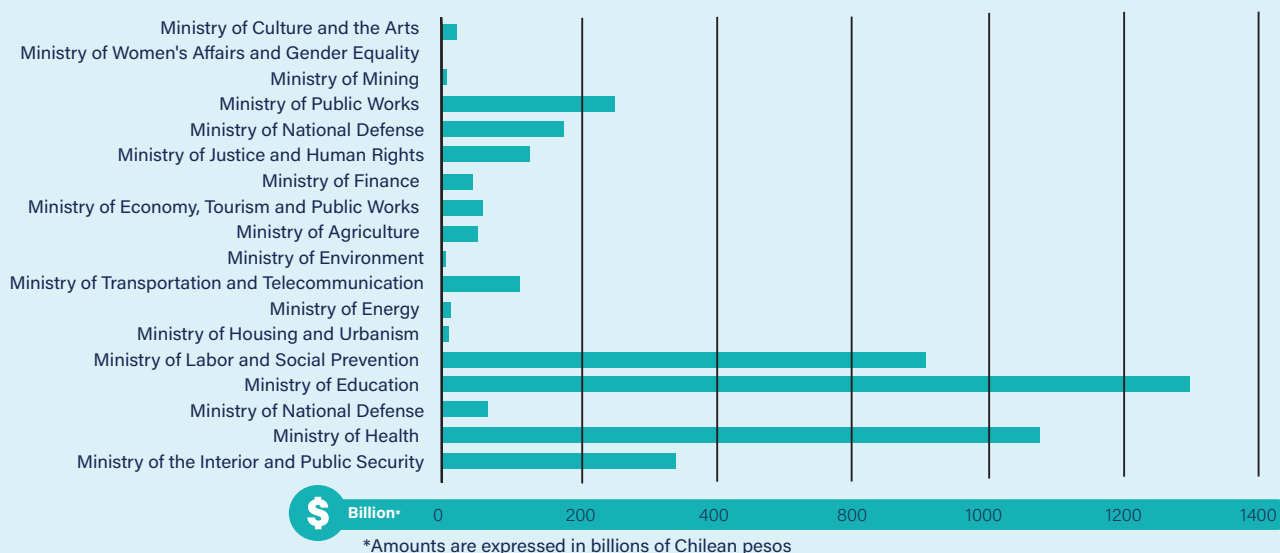
### KEY OPPORTUNITIES

Implementing progressive and green fiscal policies is essential to close climate finance gaps and discourage polluting activities. Fiscal cooperation at the regional and international level needs to be strengthened to trigger sustainable development.

## 5.1 The role of the public sector

The distribution of the federal budget makes it possible to identify government priorities in the development planning of Latin American and Caribbean countries.

Figure 16. Budget allocation for strategic sectors in Chile 2019.

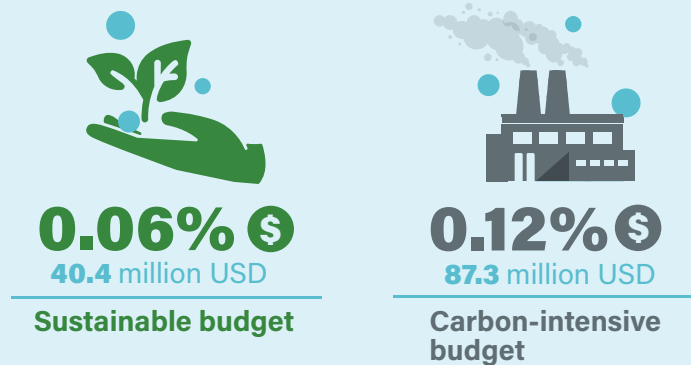


Source: Prepared by the authors with information from GFLAC, 2021.



In 2019, the hydrocarbon budget accounted for 0.12% of the total central government budget, twice as much as the country's sustainable budget, which is made up of labeled spending for climate change, energy efficiency, renewable energy and natural disasters (GFLAC, 2021).

**Figure 17. Comparison of sustainable budget versus carbon-intensive budget.**

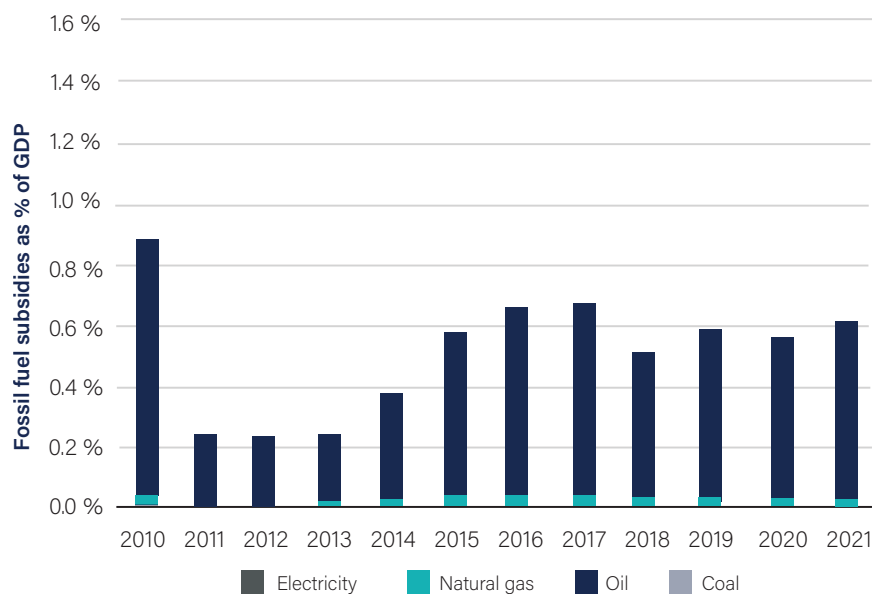


Source: Prepared by the authors with information from GFLAC, 2021.

The country has maintained fossil fuel subsidies for the last decade, over 0.6% of GDP in 2021 (FossilFuelSubsidyTracker.org, 2022), which is

was worth more than US\$1.9 billion according to Chile's GDP reported by the World Bank (World Bank, 2021).

**Figure 18. Fossil fuel subsidies as a percentage of GDP.**



Source: Own elaboration based on FossilFuelSubsidyTracker.org, 2022.

Chile has had a carbon tax since 2017 (Our World in Data, 2022), the tax amounts to 29.4% of the country's greenhouse emissions with a price of US\$5/tCO<sub>2</sub> e. Revenues reached \$160 million USD in 2022 (World Bank, 2022).

## 5.2 International cooperation

Chile receives international cooperation for mitigation and adaptation projects from different international organizations. These resources include non-reimbursable support and loans.

**Table 4.** List of projects and amounts approved for Chile from different international cooperation agencies.

Agency / Institution	Scope of the project	Amount approved for the period 2016-2022 (Million US\$)			Approved projects period 2016-2022			
		Non refundable	Loan	Co-financing	Mitigation	Adaptation	Others	Preparation
Green Climate Fund (GCF)	Chile only	5.96	63.61	--	2	--	1	10
	Multiple countries	9.85	43.43	54.84	3	--	1	1
Global Environment Facility (GEF)	Chile only	13.75	--	117.23	--	--	9	--
	Multiple countries	4.91	--	48.71	--	--	4	--
UN Climate Technology Centre and Network (CTCN)	Chile only	0.87	--	--	1	2	2	--
	Multiple countries	0.30	--	--	--	--	2	--
Inter-American Development Bank (IDB)	Chile only	--	1,277.91	--	14	5	10	--
	Multiple countries	--	--	--	--	--	--	--

Source: Prepared by the authors based on CTCN, 2022; IDB, 2022; GEF, 2022.GCF, 2022.



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# Chile



## Country profile February 2024

This profile contributes to iGST's independent Regional Climate Change Assessment for Latin America and the Caribbean. Find the Regional Assessment and other country profiles at [iniciativaclimatica.org](http://iniciativaclimatica.org)

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