Cabo Verde's First Biennial Update Report

2023

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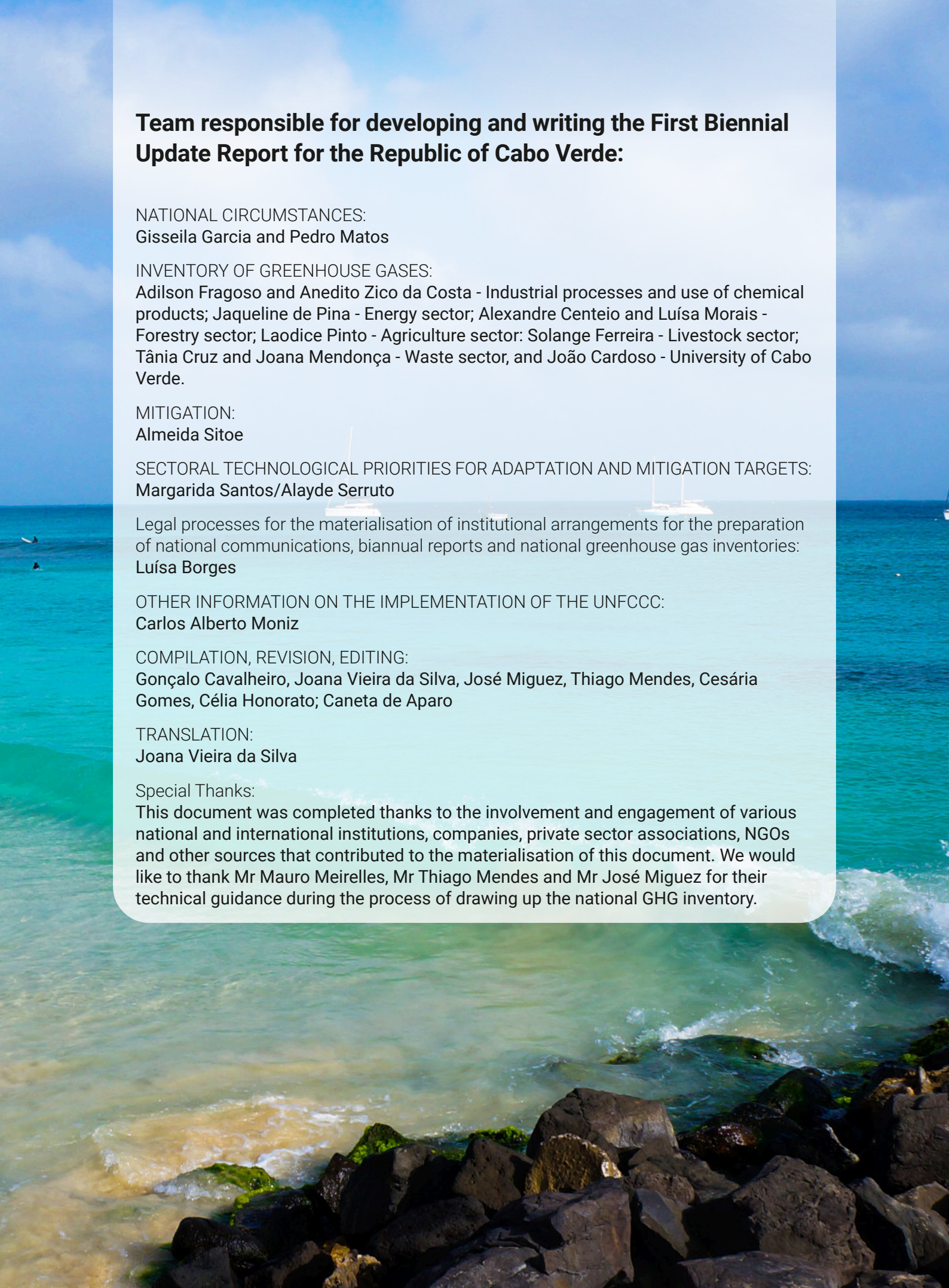

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Contents

List of Tables

List of Figures

Acronyms and abbreviations

ANAS	National Water and Sanitation Agency
AR5	IPCC Fifth Assessment Report
BUR	Biennial Update Report
CBO5	Biochemical Oxygen Demand
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
DGASP	General Directorate of Agriculture, Forestry and Livestock
DNA	National Environment Directorate
DNICE	National Directorate for Industry, Trade and Energy
ETAR	Domestic Wastewater Treatment Plants
FAO	Food and Agriculture Organisation of the United Nations
GEE	Greenhouse Gases
Gg	Giga grams (1000 tonnes)
Gg CO_{2eq}	Giga grams of carbon dioxide equivalent
HFCs	Hydrofluorocarbons
LULUCF	Land Use, Land Use Change and Forestry
INE	National Institute of Statistics
INGEE	National Greenhouse Gas Inventory
INMG	National Institute of Meteorology and Geophysics
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
MAA	Ministry of Agriculture and Environment
MRV	Monitoring, Reporting and Verification
N_2O	Nitrous oxide
NA	Not Applicable
NAMA	Nationally Appropriate Mitigation Action
NE	Not Estimated
NO	Not occurring
PAG	GWP - Global Warming Potential
PENGER	National Strategic Plan for Waste Prevention and Management
QA	Quality Assurance
QC	Quality Control
SAR	IPCC Second Assessment Report
t	tonne
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollar

Foreword

I am very honoured to take on the responsibility of signing the foreword of the first Biennial Update Report (BUR) of Cabo Verde, as a Party to the United Nations Framework Convention on Climate Change (UNFCCC). It is a very important tool, as it reports the state of the art regarding various aspects of climate governance and action.

We are pleased to note that this document fulfils the requirements of the UNFCCC Secretariat, making it easier to monitor progress in implementation of our Nationally Determined Contribution (NDC). It also provides interested citizens, the technical and scientific community and public decision-makers with valuable data and information for carrying out their activities. In fact, it summarises the country's climate, environmental, social and economic profile and public policies, presents the greenhouse gases (GHG) inventory and describes emissions' reduction measures, as well as the needs and support received in the areas of finance, technology and capacity building.

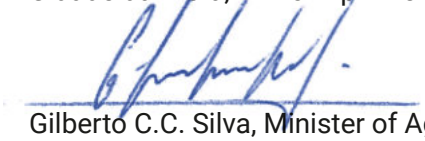
Looking at the data presented, this BUR highlights the insignificance of Cabo Verde's GHG emissions in the context of global warming. Meanwhile, given that it follows the agreed methodological guidelines, it does not analyse the country's exposure to the severe consequences of climate change, nor the corresponding adaptation policies and measures, which are of vital importance in implementing our sustainable development agenda.

Despite this "gap", and even though the preparation of the BUR by the Small Island Developing States (SIDS) is optional, I am convinced that the experience gained in this exercise will facilitate the preparation of the Biennial Transparency Report (BTR). This is relevant insofar as the preparation of the BUR will be discontinued by the Parties of the Paris Agreement to make way for the mandatory presentation of the BTR by those Parties (as is the case of Cabo Verde) from December 2024 onwards.

I am also pleased to note that the national team responsible for drawing up this BUR has been up to the task entrusted to them, through good institutional coordination and better use of the assistance made available. Cooperation with our partners, especially the GEF, the UNDP and the Lusophone Cluster under the Partnership on Transparency in the Paris Agreement was essential to the success of this exercise.

The Government, through the Ministry of Agriculture and the Environment, would like to take the opportunity to thank the partners and experts involved in the preparation of this BUR, that translates the enhanced capacity in the preparation of inventories and the presentation of reports, which undoubtedly means another qualitative leap in the consolidation of governance and transparency of Climate Action in Cabo Verde

Cidade da Praia, 24th of April 2024



Gilberto C.C. Silva, Minister of Agriculture and the Environment

Executive summary

1. National circumstances

Country name	Cabo Verde
Year	2023
Most recent national report to the UNFCCC and year of submission	3rd National Communication, submitted in October 2018.
Description of the objective of the Nationally Determined Contribution (NDC) (economy-wide and/or sectoral mitigation targets)	Reduction, by 2030, of 18% of emissions compared to the baseline scenario and up to 24% with international support.
Description of the long-term mitigation objectives and the respective timeline, if applicable	A carbon-neutral economy by 2050.
Sectors (or sub-sectors) covered by the NDC, if applicable	The NDC covers all sectors of the economy of Cabo Verde..

Summary table

Cabo Verde is a small archipelagic country, located in the middle of the Atlantic Ocean, with a mild, tropical climate, strongly influenced by the cold current from the Canary Islands in terms of temperature. Drinking water is a scarce resource and this scarcity is often exacerbated by the drought phenomenon that the country has faced throughout its history.

The resident population in Cabo Verde is 491,233, with an average life expectancy of 73.0 years for men and 80.5 years for women.

Poverty in the country is mainly associated with food insecurity, working conditions, and purchasing power. Considered as an example in Africa, Cabo Verde showed a reduction in extreme poverty from 26.5% in 2015 to 11.1% in 2022, mainly due to the implementation of public social protection policies.

Cabo Verde is a country with few natural resources, with approximately 10% of the land considered suitable for cultivation. Tourism is the main sector driving the country's economy, contributing 25% of GDP and accounting for approximately 40% of all activity.

The energy sector in Cabo Verde is characterised by the consumption of fossil fuels (oil derivatives), biomass (firewood) and the use of renewable energies, namely wind power. The country has one of the highest electricity access rates in Africa: 92% in 2019 but has one of the highest electricity tariffs in the world: 0.32 USD/kWh. Approximately 81.6% of the electricity produced in Cabo Verde in 2019 came from thermal sources.

Cabo Verde currently guides its strategy for strengthening resilience and mitigating and adapting to climate change through various political and strategic instruments: the Government Programme of the IX Legislature 2021-2026; the Strategic Plan for Sustainable Development; the Nationally Determined Contribution updated in 2020; and sectoral policy instruments.

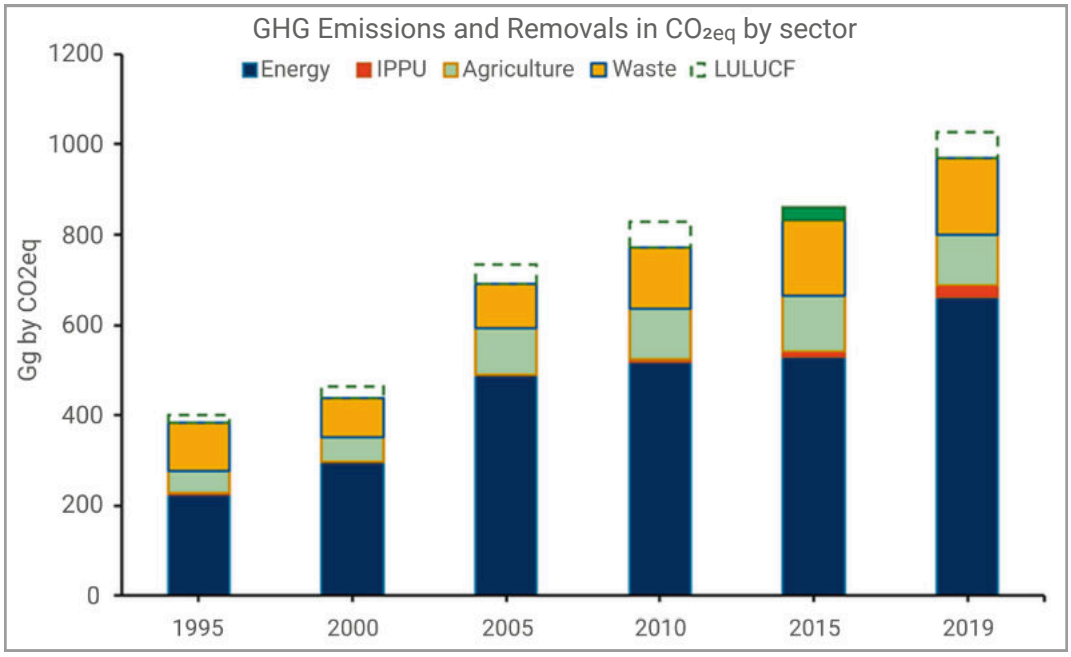
The Ministry of Agriculture and Environment (MAA) is the government department whose mission is to design, coordinate, control, execute and evaluate the specific policies defined by the government for sectors such as agriculture, forestry, livestock, agro-industry, food and nutritional security, environment and natural risks, climate, and water and sanitation. In particular, the MAA is responsible for promoting and developing climate change mitigation and adaptation policies.

Cabo Verde has not yet officialised the creation of a national MRV/Transparency system. However, there are several procedures that allow for the preparation of National Communications and the Biennial Update Report. The national greenhouse gas inventory is drawn up in accordance with the IPCC guidelines by the team established in the Council of Ministers Resolution 37/2022 of 07 April.

2. National Greenhouse Gas Inventory

Time series (years covered by the inventory)	1995-2019

GHG emissions and removals, in CO2eq. by sector, in 1995, 2000, 2005, 2010, 2015 and 2019



In 2019, total national emissions, without LULUCF, are estimated at around 969.53 Gg CO_{2eq}, representing an increase of 16.71 % compared to 2015, and 153.21% compared to 1995.

Total national emissions from LULUCF are estimated at around 910.54 Gg CO_2, representing an increase of 5.74 % compared to 2015 and 126.80% compared to 1995.

3. Mitigation actions

Measure	Targets and objectives
Energy Efficiency in Buildings and Equipment Programme	The main objective is to promote the reduction of electricity consumption through energy efficiency.
Efficient street lighting	Improving energy efficiency, reinforcing, and extending public lighting in the cities of Praia and Santa Maria.
Sustainable Energy Access for Water Management: Energy-Water Nexus	The main objective of the action is to catalyse the transition to sustainable practices in water production by promoting the commercial use of renewable energy (RE) and energy efficiency (EE) technologies in desalination and water pumping systems and the development of Energy Service Companies (ESE).
Sustainable mobility	Support the purchase of 600 electric vehicles and 100 charging stations.
Increased use of renewable energies in electricity production	Promote the inclusion of solar photovoltaic plants in the national electricity system, including distributed generation.
REFLOR - Strengthening the capacity for adaptation and resilience in Cabo Verde's forestry sector	Contribute around 10% to the national commitment to afforestation and CO2 removal.

Cabo Verde's efforts have been underway since 2009, with the creation of the Interministerial Committee for Climate Change (Resolution 16/2009), approved with the aim of improving climate change monitoring in the country. This Committee acts as the Designated National Authority to coordinate government actions with those arising from the UNFCCC, its Subsidiary Bodies, the Kyoto Protocol, and the IPCC.

The mitigation chapter presents a series of measures, primarily focused on the energy sector, where most of the country's GHG emissions are concentrated. Other initiatives are already underway, such as the development of Cabo Verde's Long-Term Low Emissions Development Strategy (LT-LEDS CV 2050), the creation of the legal framework for the Climate Law, the definition of climate markers for the State budget and the design of the national transparency system.

4. Finance, technology and capacity-building needs and support received

International financial resources received in the reporting period (2016-2022) [USD]	49.9 million USD
Main international technology transfers, capacity building and technical support received in the reporting period (2016-2022)	• Training of trainers in Bioenergy • Promoting electric mobility in Cabo Verde • Promoting solar thermal energy for water heating • REFLOR CV - new technologies for reforestation
Main international support required (qualitative description with quantitative estimate of the corresponding financial requirements, where applicable)	• Cabo Verde's support needs are financial as well as technical and technological. • The country continues to need support for the definition, but particularly the implementation and monitoring of mitigation and adaptation actions. • Building and strengthening systems that formalise and consolidate the role of each entity in climate policy is fundamental.

Cabo Verde received financial support totalling USD 49,882,507 (forty-nine million, eight hundred and eighty-two thousand, five hundred and seven US dollars) between 2016 and 2022. Of this, **80%** was earmarked for **mitigation projects** and **20% for adaptation projects**, with USD 39,955,687 (thirty-nine million, nine hundred and fifty-five thousand, six hundred and eighty-seven US dollars) channelled to **mitigation** and USD 9,926,820 (nine million, nine hundred and twenty-six thousand, eight hundred and twenty US dollars) to **adaptation**.

The sectors that have received the most climate finance are energy, transport, agriculture, and water resources. These sectors have received between USD 3,284,145 (three million, two hundred and eighty-four thousand, one hundred and forty-five US dollars) and USD 30,096,937 (thirty million, ninety-six thousand, nine hundred and thirty-seven US dollars).

1. National circumstances

The summary description of Cabo Verde's national reality presented in this biennial update report should be complemented with the more detailed description included in the National Communication. The national circumstances of the Energy sector are presented in greater detail, due to the importance of this sector for reducing emissions in Cabo Verde, duly described in the mitigation chapter.

1.1 Geographical and climate profile

1.1.1 Territory description

Cabo Verde is a small archipelagic country located in the middle of the Atlantic Ocean (Figure 1), off the coasts of Senegal and Mauritania, at around 455 km from the west coast of Africa, between latitudes 14º 23' and 17º 12' North and longitudes 22º 40' and 25º 22' West (Cuitandokter, 2022). It is made up of ten islands (nine of which are inhabited: Santo Antão, São Vicente, São Nicolau, Sal, Boa Vista, Maio, Santiago, Fogo and Brava; and one that is not inhabited: Santa Luzia), and eight islets (Branco, Raso, Grande, Luís Carneiro, Cima and the Rombo or Seco islets), with an Exclusive Economic Zone that stretches for more than 730,000 km2 (Fonseca, 2020). The archipelago has a total surface area of 4,033 km2. The coastline stretches for approximately 1,020 km, alternating between bays with white or black sand beaches and rugged cliffs (Pereira et al., 2018). The country's capital is Praia (Santiago Island).

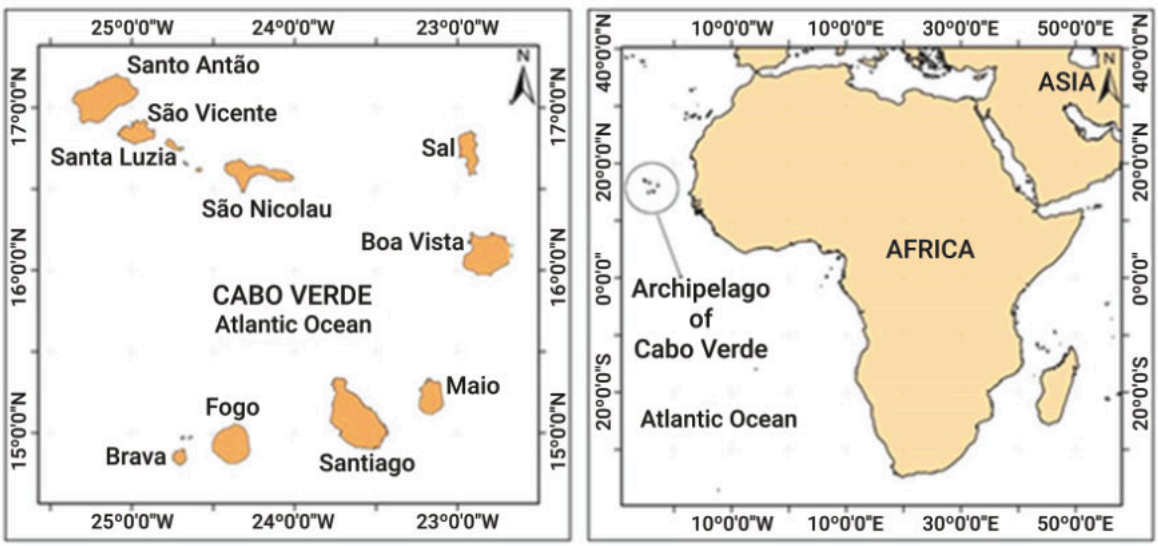


Figure 1: Geographical location of Cabo Verde

Source: Pereira et al. (2018).

1.1.2 Climate characterisation

The country's climate is mild, tropical, with a strong influence from the cold current of the Canary Islands in terms of temperature. And throughout the year, this climate is also

influenced by the anticyclones of the Azores. In addition, the variability of the subtropical Azores acts as a regulating factor for rainfall anomalies, by controlling the seasonal oscillation characteristics of the trade winds and the maritime and continental characteristics during the dry months (November - June) (Neves, 2017).

Between July and October, the summer season, Cabo Verde is influenced by convective systems that are associated with undulating disturbances to the east, providing a wetter climate and triggering periods of rain. And between December and February, the archipelago is affected by air masses from extratropical latitudes, which provide a dry subtropical climate (Chaves, 2021).

1.1.3 Water Resources

In Cabo Verde, drinking water is a scarce resource and this scarcity is often exacerbated by the drought phenomenon that the country has faced throughout its history.

Cabo Verde has recently been facing long periods of drought and when it rains, it is torrential rain, causing flooding in several regions (Correia, 1988; Shahidian, 2015; Madeira, 2018; Martins, 2019).

According to data from the National Statistics Institute (INE) (2021a), in 2019 only 69% of the population reported having the public network as their main source of water supply. Approximately 80% of the water consumed in Cabo Verde comes from seawater desalination.

1.2 Population and economic profile

1.2.1 Demographic Profile

According to the results of the fifth General Population and Housing Census (RGPH-2021), the resident population in Cabo Verde is 491,233, 1.6% less than in the 2010 census (INE, 2022). The same data also shows that there are more men (246,363) than women (244,847) in the country.

In 2019, the average life expectancy for men was 73.0 years, while for women it was 80.5 years (INE, 2021).

1.2.2 Absolute poverty indicators

Considered as an example in Africa, Cabo Verde has seen a reduction in the proportion of the population living in extreme poverty (on less than 1.90 dollars a day) from 26.5% in 2015 to 11.1% in 2022, mainly due to the implementation of public social protection policies. This trajectory was interrupted by the socio-economic impact of the COVID-19 pandemic but re-established with the implementation of the National Strategy for the Eradication of Extreme Poverty (ENEPE) 2022-2026, covering sectors such as infrastructure, education and vocational training, small and medium-sized enterprises (World Bank, 2023).

1.2.3 Economic and Social Development

Cabo Verde is a country with few natural resources, with approximately 10% of the country's land considered suitable for cultivation (World Bank, 2021). Tourism is the main sector driving the country's economy, contributing 25% of GDP and accounting for approximately 40% of all activity (World Bank, 2021). According to the World Bank (2021), the country's average growth between 2016 and 2019 was 4.7% (3.4% in per capita terms).

1.2.4 Industrial Profile

In 2018, there were 927 companies in activity in the industry sector, representing a 1.9% variation compared to the previous year (an increase of 17 companies). Of these 927 companies, 20.1% provided services in the food industry, 16.4% in the manufacture of furniture and mattresses, and 12.9% in the manufacture of metal products, except machinery and equipment (INE, 2021a).

1.2.5 Imports of goods and services

Overall, imports increased by 30.4 % in value from 2015 to 2019 and rose by 20.0% in terms of weight over the same period (INE, 2021a).

In 2019, the European continent was Cabo Verde's main supplier, with 79.6% of the total value imported and 81.6% of the total weight imported (INE, 2021a). The African continent is the economic zone with the smallest contribution (2.0%) to the total value of imports.

1.2.6 Exports of goods and services

Between 2015 and 2019, exports of goods fell by 8.6% in value and 12.7% in weight (INE, 2021a).

Cabo Verde's exports are concentrated in Consumer Goods, with 94.4% of the value exported, and Intermediate Goods (5.6%) (INE, 2021a).

The European continent continues to be Cabo Verde's main customer, with 96.4% of the total value exported and 69.7% in terms of total weight exported (INE, 2021a).

Exports of services have been growing since 2016, and in 2019 they grew by 13%. The services that contributed most to this increase were transport, travel, and other business services (INE, 2021).

1.2.7 Energy

Cabo Verde's energy sector is characterised by a heavy dependence on imports of fossil fuels, namely: butane gas, petrol, Jet A1, diesel, fuel oil, lubricants, and others, both for electricity production, and for transport, industry, and other sectors of the economy. Cabo Verde re-exports part of its imported fossil fuels for international transport, Jet A1 for international aviation and diesel and fuel oil for maritime transport.

The most widely used renewable energies in the country are biomass, wind and solar energy. Biomass is basically used for cooking wood in rural areas and on the outskirts of cities.

The country has made important progress in the field of energy, but there are still challenges to face. The electricity access rate reached 92.2% in 2019, corresponding to an increase of around 1.4 percentage points compared to 2018. This increase was due to the implementation of a major rural electrification programme that will cover the entire national territory with electricity grids or micro-grids by 2030. The adoption of the social electricity tariff, as a measure to protect economically vulnerable electricity consumers, will also contribute to increasing the percentage of the population with access to electricity.

Primary access to clean fuels and technologies has risen from 73.5% in 2016 to 78.9% in 2019. In 2019, around 20.2% of the country's population used firewood as their main cooking resource.

In Cabo Verde, renewable energies have always been an energy option, albeit on a small scale through small demonstration projects, essentially wind energy. It wasn't until 2012, when solar and wind farms started operating on the islands with the highest consumption (Santiago, São Vicente, Sal, and Boa Vista), that renewable energies began to make a significant contribution to the country's energy mix.

The following figure shows the evolution of electricity production in GWh from 2010 to 2020, by type of source.

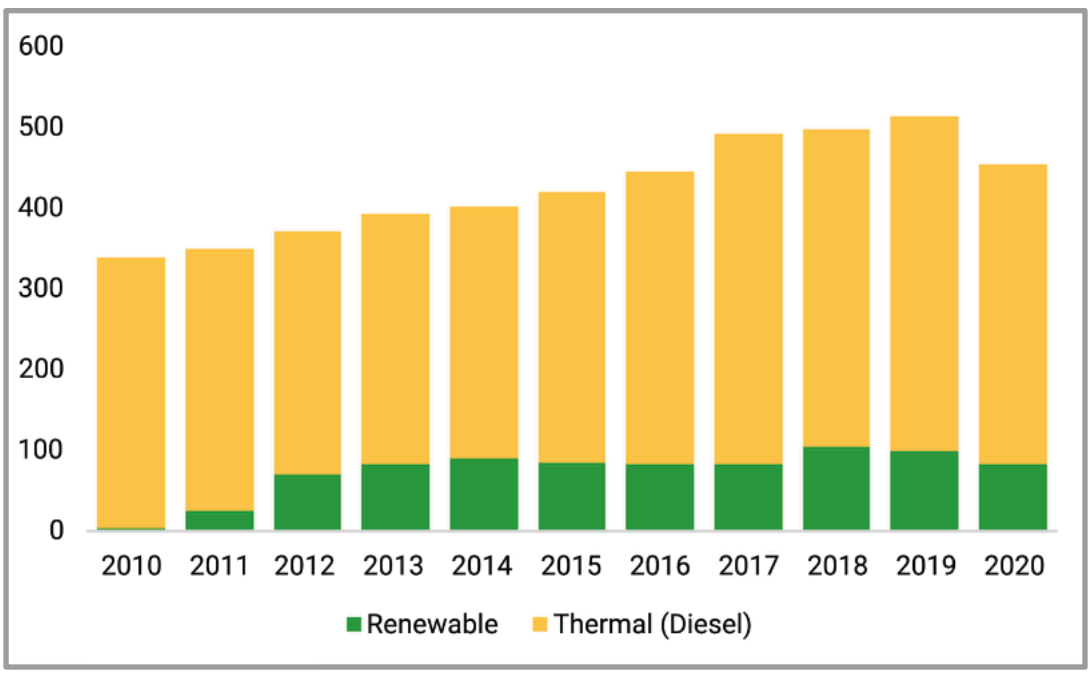


Figure 2 – Evolution of electricity production, in GWh

In 2020, total electricity production was 453 GWh, a decrease of around 12% compared to 2019, when it was 512 GWh. The decrease in electricity production observed in 2020 is essentially due to the COVID-19 pandemic, which led to a decrease in consumption in the economy.

In 2019, approximately 80.7% (around 413 GWh) of the electricity produced in the country came from thermal sources, representing an increase of 5.2% compared to 2018, with 392 GWh. Wind power contributed around 16% in 2019 (82 GWh) to total electricity production, a decrease of 7.9% compared to 2018 (89 GWh).

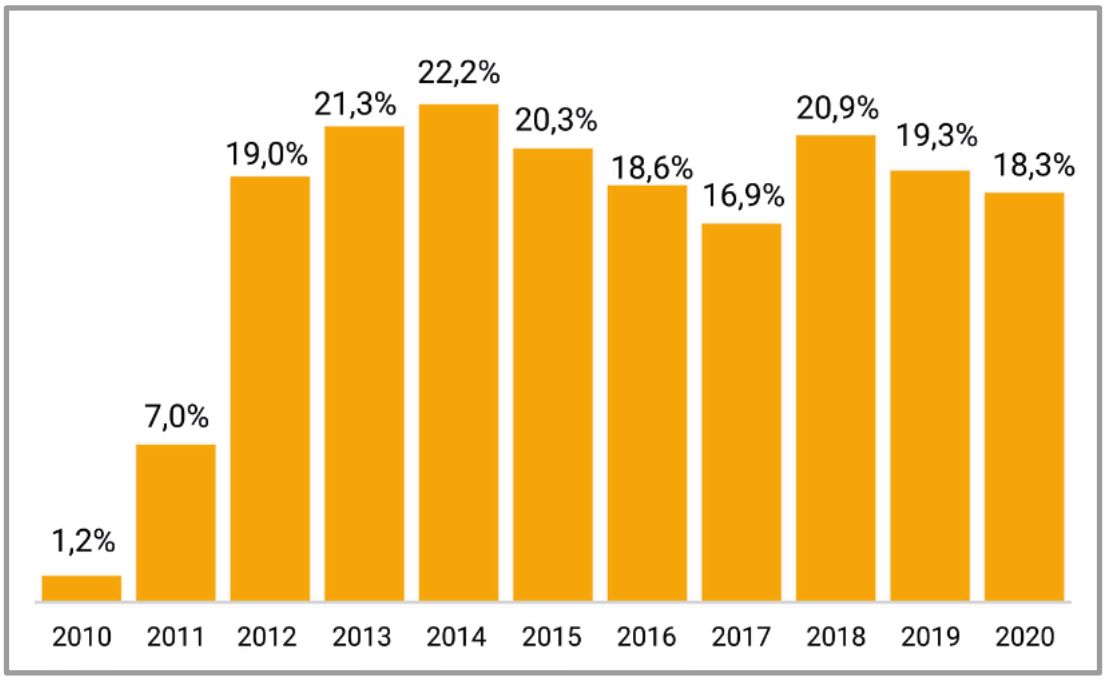


Figure 3 – Evolution of the renewable energy penetration rate (%)

According to the 2017-2030 Electricity Sector Master Plan, the country has the potential to reach 25% penetration of renewable energies in electricity production by 2025 and exceed 50% by 2030, and major investments in renewable energies are already planned to achieve the targets.

1.2.8 Road transport

Land transport in Cabo Verde accounts for around 30% of total fossil fuel consumption, generating significant external energy dependence. To mitigate this consumption and overcome this dependency, the National Programme for Energy Sustainability (PNSE) was created, which aims to establish, in the long term, a safe and accessible energy transition for all (ME, 2023).

1.2.9 Maritime Port System

Shipping traffic in national ports decreased by 20.8% in 2020 compared to 2019, corresponding to 6,226 ship movements (INE, 2020). There were 1,024 long-haul ship movements (664 fewer than in 2019) and 5,202 cabotage ship movements (970 fewer than in 2019) (INE, 2020). This obviously affected the amount of goods transported, which fell by 36.9% compared to 2019; as well as the number of passengers, which fell by 31.7% in 2020 compared to the previous year (INE, 2021a).

1.2.10 The airport system

In terms of airport infrastructure, the country currently has four (4) international airports, located on the islands of Santiago, Boa Vista, Sal and São Vicente. The other islands, except for Santo Antão, Brava and Santa Luzia, have an aerodrome for domestic flights (INE, 2021a).

1.2.11 Air transport

According to the annual report on transport statistics, air transport movements decreased considerably in 2020, mainly due to the impact of the COVID-19 pandemic on international and domestic tourism. At the country's airports, there was a 62.1% decrease compared to 2019 (INE, 2021b).

In absolute terms, this decrease corresponds to 13,357 aircraft movements in 2020 compared to 21,845 in 2019 (INE, 2021b). The number of passengers travelling through Cabo Verde's airports and aerodromes in 2020 was 793,302, representing a decrease of 71.4% compared to 2019 (INE, 2021b).

There was also a 46% drop in the volume of cargo in airport spaces compared to 2019. In absolute terms, this corresponds to 125,717 tonnes of cargo loaded (183,693 tonnes less than in 2019) and 620,240 tonnes of cargo unloaded (460,582 tonnes less than in 2019).

1.3 National policy agenda for climate change

Currently, Cabo Verde's strategy for strengthening resilience, mitigation and adaptation to climate change is guided by various political and strategic instruments, approved at both national and local level. The instruments at national level, which define the country's entire strategy for combating the harmful effects of climate change, are based on a set of cross-cutting principles, namely sustainability, integrated management of natural resources and economic growth in harmony with the environment, food security, community participation and poverty eradication. Regarding the positioning of climate change in current national policies, the issue is a priority in government policy.

The specific policy instruments that currently shape the current policy on Climate Change, are the following: the Government Programme of the IX Legislature 2021-2026, the Nationally Determined Contribution 2020 (NDC 2020), the Policy Charter for the Blue Economy, the Strategic Plan for Sustainable Development 2022-2026 (PEDS II), National Programme for Energy Sustainability (PNSE), the Electricity Sector Recovery and Reform Project (UGPE), and the National Adaptation Plan (NAP), among others. Details of the Government Programme, the NDC 2020 and the Blue Economy Policy Charter are presented in Cabo Verde's 4th National Communication.

The first pillar of the Government Programme for the 9th Legislature (2021-2026) is the Economy Pillar, comprising 13 programmes. In this pillar, the fight against climate change is revealed in various targets, namely in the energy transition and blue economy policies. The Social Pillar comes next, with 5 programmes, which also recognises the role of climate change in undermining gains in social rights and the need for assertive responses. Climate action is dealt with autonomously in the Environment Pillar,

which includes 3 programmes. In the Climate Action and Resilience Programme, PEDS II sets the following goal: *We aim to build Cabo Verde's resilience by 2030, promoting increased knowledge of climate change and minimising its negative impacts, through climate change planning and budgeting at all levels, national and local, both in terms of mitigation and adaptation*.

Furthermore, within the scope of PEDS II and specifically the Climate Action and Resilience Programme, it is planned to achieve important results, such as: the implementation of public policies to improve climate governance, institutional arrangements and climate-sensitive planning; the improvement of local resilience, combating poverty and identifying opportunities for adaptation and low-carbon development at community level, to be included in municipal planning; the strengthening of adaptation actions to address current and future vulnerabilities; implementing mitigation actions for the benefit of the country's development; understanding climate change and implementing concerted and planned responses to extreme weather events, based on scientific data; expanding information, education, awareness-raising and capacity-building on climate change; establishing new climate governance to ensure the planning, management and implementation of the country's climate policy.

With the full implementation of PEDS II, Cabo Verde will be a more resilient and inclusive country in the face of climate change and there will be a 10 % reduction in CO2 and other GHG emissions throughout the economy. Within the PEDS II horizon, 5 municipalities must implement gender-sensitive municipal adaptation plans in the face of climate change to increase the resilience of the most vulnerable communities. It is also one of the goals of PEDS II that at least 70% of the population will have access to gender-sensitive climate information and alerts, prioritising at least 50% of the most vulnerable groups, and that climate governance will be strengthened to be more effective and efficient both from a mitigation and from an adaptation point of view.

1.4 Institutional provisions related to MRV / Transparency

The overall coordination of the MRV system should be under the Ministry of Agriculture and Environment (MAA) on the basis of an operational institutional arrangement involving all the interested parties and stakeholders who collaborate in the process of drawing up the National Inventory of GHG Emissions and Removals.

The following table lists the public, private and/or civil society organisations that produce or hold data and information relevant to estimating emissions and removals for the national GHG inventory. These are considered Stakeholders that can be part of the National GHG Emissions and Removals Inventory System or National MRV System.

Table 1: National entities that produce or hold data

ORGANISATIONS/INSTITUTIONS	INSTITUTIONS/ GENERAL DIRECTORATES
National Institute of Meteorology and Geophysics (INMG)	Responsible for coordinating and implementing measures and policies in the field of meteorology and geophysics; focal point at the UNFCCC.
National Environment Directorate (DNA)	Coordination of natural resource management and environmental protection policies; operational focal point for the GEF.

ORGANISATIONS/INSTITUTIONS	INSTITUTIONS/ GENERAL DIRECTORATES
Directorate-General for Energy (DGE)	Government agency responsible for national energy policy; leads the analysis of GHG mitigation.
National Fisheries Development Institute (INDP)	Responsible for the development of studies and research into fisheries; participates in identifying the impacts of climate change on fisheries.
National Institute for Agricultural Research and Development (INIDA)	In charge of agricultural research and development, contributes to impact assessment and adaptation practices.
National Civil Engineering Laboratory (LEC)	Carries out research and development in civil engineering; contributes to understanding the impacts of climate change on infrastructure.
National Water and Sanitation Agency (ANAS)	New regulatory structure for water resources and sanitation; participates in climate change adaptation projects.
Water service of Santiago - Águas de Santiago (ADS)	Provides drinking water; participates in studies on the vulnerability of water resources to climate change.
Multisectoral Regulatory Agency for the Economy (ARME)	Regulates water, energy, and transport sectors; contributes to economic efficiency and financial balance.
Municipalities (CM) and Municipal Associations	Local entities with a relevant role in planning and management; participates in vulnerability studies and data collection.
National Civil Protection and Fire Service (SNPCB)	Implements civil protection policies; contributes to coordinating disaster response and raising public awareness.
Directorate-General for Agriculture and Rural Development (DGADR)	Implements agricultural policies; participates in assessments of GHG emissions related to agriculture.
Ministry of Infrastructure, Transport and Maritime Economy	Implements policies in public works, transport, and marine resources; contributes to GHG mitigation strategies in the transport sector.
Directorate-General for Spatial Planning and Urban Development (DGOTDU)	Responsible for national land-use planning policies; leads risk assessments in partnership with other organisations.
National Statistics Institute (INE)	Collects and analyses statistical data; participates in the GHG inventory working group.
Parliamentary Network for Desertification, Environmental Protection	Network of Members of Parliament interested in environmental issues; supports the integration of policies and laws related to climate change.
National Institute for Gender Equality and Equity (ICIEG)	Promotes gender equality and gender mainstreaming in public policies; participates in environmental protection projects.
Private Sector (Trade Associations, Industrial/Commercial Companies, Construction Companies, Oil/Gas Companies, Conventional and Renewable Energy Companies)	Supports economic development policies; contributes to development strategies for commercial and industrial sectors.
Higher Education and Research Institutions	Monitors impacts of climate change; participates in studies and research related to GHG and adaptation.
NGOs, Community Associations and Women's Organisations	Civil society involved in adaptation practices and projects related to climate change and renewable energy.

2. National GHG Inventory (Greenhouse Gas Emissions and Removals)

2.1 Inventory summary

Main results:

In 2019, total national emissions, without LULUCF, are estimated at around 969.53 Gg CO2eq, representing an increase of 16.71% compared to 2015, and 153.21% compared to 1995.

Total national emissions from LULUCF are estimated at around 910.54 Gg CO2eq, representing an increase of 5.74% compared to 2015 and 126.80% compared to 1995.

The most representative greenhouse gas (GHG) is CO2, estimated at around 667.40 Gg, representing an increase of 15.53% compared to 2015 and 118.27% compared to 1995.

Methane (CH4) and nitrous oxide (N2O) originate mainly in the agricultural and waste sectors, and together accounted for around 23.95% of total emissions in 2019, corresponding to 218.06 Gg CO2eq.

Fluorinated gases (F-Gases), which essentially originate in refrigeration and air-conditioning systems in the Industrial Processes and Product Uses sector, saw an increase of around 250-800% in 2019 compared to 1995.

In 2019, the energy sector accounted for around 72.69% of total national emissions, with LULUCF, essentially due to energy production, and transport as the most important sources, accounting for around 31.35% and 28.79% of total national emissions respectively.

The waste and agriculture sectors together contributed around 30.90% of total national emissions in 2019, including LULUCF.

In 2019, each person in the country emitted around 1.82 tCO2eq, representing a 75% increase compared to 1995.

2.2 National GHG inventory system

A technical team, approved by the Council of Ministers through Resolution 37/2022 of 7th April, was set up to draw up the National GHG Inventory. The Ministry of Agriculture and the Environment (MAA), through the National Directorate for the Environment (DNA), coordinates the preparation of the National GHG Inventory and is responsible for liaising with the various government sectors that contribute to gathering information for the preparation of sectoral inventories.

The technical team is made up of various government sectors responsible for drawing up sectoral inventories relies on the scientific community (universities) to support the development of studies.

Figure 4 shows the institutional arrangement for drawing up the National GHG Inventory.

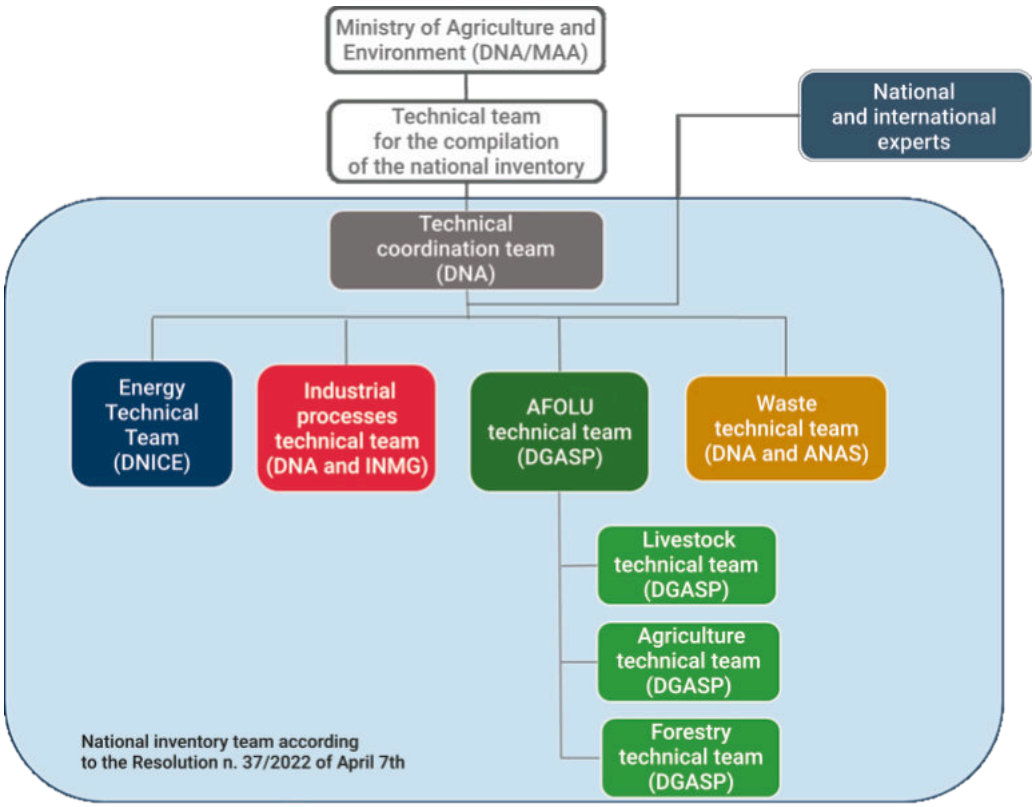


Figure 4 - Institutional arrangement for preparing the National GHG Inventory

The technical teams responsible for drawing up the sectoral inventories were accompanied throughout the process of collecting, processing, and estimating GHG emissions by international experts from the Lusophone Cluster of the Transparency Partnership of the Paris Agreement, as well as national sectoral partners in technical discussion sessions when necessary.

2.3 Methodology

The inventory is structured according to the guidelines produced by the Intergovernmental Panel on Climate Change (IPCC), covering the following sectors: Energy; Industrial Processes and Other Products (IPPU); Agriculture, Land Use, Land Use Change and Forestry (LULUCF); and Waste.

The methodological approaches and guidelines used in the development of the National GHG Emissions Inventory follow the 2006 IPCC Revised Guidelines for National Greenhouse Gas Inventories (IPCC, 2006). For all sectors, the Tier 1 methodological level provided in the 2006 IPCC Guidelines was used.

The latest inventory estimates emissions for 2019. This inventory considers emissions of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and F-gases. Emissions due to the

precursor gases carbon monoxide (CO), nitrogen oxide (NOx), and non-methane volatile organic compounds (NMVOC) have not been accounted for in this inventory but will be presented in the Fourth National Communication. Other gases, such as sulphur dioxide (SO2), were not estimated because they are not very significant in the national reality.

To maintain the consistency of the time series, GHG emissions and removals for 1995, 2000, 2005 and 2010 were also recalculated. This inventory also analysed the key categories to identify the sub-sectors that should be prioritised in terms of methodological improvements, taking into account their fraction of the contribution to the total emissions result. The following table shows the methodology and emission factors used to estimate GHG emissions in 2019, by sector and subsector.

Table 2 - Methodology and emission factor by gas type and source category

Categories of greenhouse gas sources	CO_2		CH_4		N_2O		HFC		PFCs*		SF6		Other fluorinated products	
	Method	Emission factor	Method	Emission factor	Method	Emission factor	Method	Emission factor	Method	Emission factor	Method	Emission factor	Method	Emission factor
1. Energy														
A. Fuel Combustion Activities														
Energy production industries	T1	D	T1	D	T1	D								
Manufacturing and construction	T1	D	T1	D	T1	D								
Transport	T1	D	T1	D	T1	D								
Other Sectors	T1	D	T1	D	T1	D								
Unspecified	T1	D	T1	D	T1	D								
B. Fugitive Emissions														
Solid fuels	NO	NO	NO	NO	NO	NO								
Oil and natural gas	NO	NO	NO	NO	NO	NO								
Other Emissions from energy production	NE	NE	NE	NE	NE	NE								
2. Industrial Processes and Product Uses														
A. Mineral Industry														
Cement production	NO	NO	NO	NO										
Lime production	NE	NE	NE	NE										
Glass production	NO	NO	NO	NO										
Other uses of carbonates in the process	NE	NE	NE	NE										
Others	NO	NO	NO	NO										
B. Chemical Industry														
Ammonia production	NO	NO	NO	NO	NO	NO								
Nitric acid production					NO	NO								
Adipic acid production	NO	NO			NO	NO								
Production of caprolactam, glyoxal and glyoxylic acid	NO	NO			NO	NO								
Carbide production	NO	NO	NO	NO										
Titanium dioxide production	NO	NO			NO	NO								
Soda ash production	NO	NO			NO	NO								

Categories of greenhouse gas sources	CO_2		CH_4		N_2O		HFC		PFCs*		SF6		Other fluorinated products	
	Emission factor		Emission factor		Emission factor		Emission factor		Emission factor		Emission factor		Emission factor	
	Method		Method		Method		Method		Method		Method		Method	
Petrochemicals and carbon black production	NO	NO	NO	NO	NO	NO								
Fluorochemical production							NO	NO	NO	NO	NO	NO	NO	NO
Others	NO	NO	NO	NO	NO	NO								
C. Metal Industry														
Iron and steel production	NO	NO	NO	NO										
Production of ferroalloys	NO	NO	NO	NO										
Aluminium production	NO	NO							NO	NO	NO	NO		
Magnesium production	NO	NO					NO	NO	NO	NO	NO	NO		
Lead production	NO	NO												
Zinc production	NO	NO												
Others	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-Energy Fuel Products and Solvent Use														
Use of lubricants	T1	D												
Use of paraffin wax	T1	D												
Use of solvents														
Others														
E. Electronics Industry														
Integrated circuit or semiconductor							NO	NO	NO	NO	NO	NO	NO	NO
Flat screen TFT							NO	NO	NO	NO	NO	NO	NO	NO
Photovoltaics							NO	NO	NO	NO	NO	NO	NO	NO
Thermal fluid							NO	NO	NO	NO	NO	NO	NO	NO
Others							NO	NO	NO	NO	NO	NO	NO	NO
F. Use of products as substitutes for substances that degrade the ozone layer														
Refrigeration and air conditioning							T1	D	NO	NO	NO	NO	NO	NO
Expansion agents							NO	NO	NO	NO	NO	NO	NO	NO
Fire protection							NO	NO	NO	NO	NO	NO	NO	NO
Aerosols							NO	NO	NO	NO	NO	NO	NO	NO
Solvents							NO	NO	NO	NO	NO	NO	NO	NO
Other applications							NO	NO	NO	NO	NO	NO	NO	NO
G. Manufacture and use of other products									NO	NO	NO	NO	NO	NO
Electrical equipment	NO	NO					NO	NO	NO	NO	NE	NA	NO	NO
SF6 and PFCs from other product uses	NO	NO							NO	NO	NO	NO	NO	NO
N_2O of product use					NO	NO								
Others	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
H. Other														
Pulp and paper industry	NO	NO	NO	NO	NO									
Food and beverage industry														
Others														

Categories of greenhouse gas sources	CO_2		CH_4		N_2O		HFC		PFCs*		SF_6		Other fluorinated products	
	Emission factor		Emission factor		Emission factor		Emission factor		Emission factor		Emission factor		Emission factor	
	Method		Method		Method		Method		Method		Method		Method	
3. Agriculture														
Livestock														
Enteric fermentation			T1	D										
Manure management			T1	D	T1	D								
Burning agricultural waste					NE	NE								
Liming	NO	NO	NO	NO	NO	NO								
Application of urea	T1	D												
Direct emissions of N_2O from managed soils					T1	D								
Indirect emissions of N_2O from managed soils					T1	D								
Indirect emissions of N_2O from manure management					T1	D								
Rice cultivation			NO	NO										
Others					NO	NO								
4. LULUCF														
B. Forestry and Other Land Uses (LULUCF)														
Forest	T1	D	T1	D	T1	D								
Agriculture	T1	D												
Grassland	T1	D												
Wetlands	T1	D												
Urban Area	T1	D												
Other land uses	T1	D												
Others														
Harvested wood products	NE	NE	NE	NE	NE	NE								
Others	NO	NO	NO	NO	NO	NO								
5. Waste														
Solid waste disposal			T1	D										
Biological treatment of solid waste			NO	NO	NO	NO								
Incineration and open air burning of waste	T1	D	T1	D	T1	D								
Wastewater treatment and discharge			T1	D	T1	D								
Others	NO	NO	NO	NO	NO	NO								
6. Other (please specify)														
Indirect N_2O from atmospheric deposition of nitrogen in NOx and NH_3					NO	NO								
Other (please specify)	NO	NO	NO	NO	NO	NO								

T1 - *Tier* 1; D -IPCC default; NE - Not Estimated; NO - Not Occurring; NA - Not applicable;
Source: Compilation of the national GHG inventory

Annex A shows the categories of GHG sources and the explanation for not reporting the emissions considered Not Estimated (NE) for these categories in this inventory.

The activity data used in this inventory comes from various sources, namely the Energy Balance obtained from the National Directorate of Industry, Commerce and Energy, the National Water and Sanitation Agency (ANAS), and data from other government departments, industries, the National Statistics Institute (INE) and others, which contributed data to the development of the national GHG inventory.

The following table summarises the activity data, sources and emission factors used:

Table 3 - Summary of activity data, sources, and emission factors by sector

Categories	Activity data and sources	Emission factor (EF)
1. Energy		
Fuel combustion	The activity data used was fuel consumption obtained from the Energy Balance (BE) for 1995, 2000, 2005, 2010, 2015 and 2019. The BE was built on the basis of data on imports, exports, fuel stocks, obtained directly from oil companies and fuel sales by sector. Renewable energy production was obtained from electricity sector operators. For transport, the sale of transport fuels (road, sea, and air) reported by the oil companies and included in the energy balance sheets was considered. Consumption is not broken down by type of vehicle. To estimate firewood consumption, data on the percentage of the population using firewood in urban and rural areas, obtained from the INE, was used to estimate the amount of the population using firewood, using statistical methods. The per capita consumption of firewood, obtained from previous studies carried out by the forestry sector, was used to estimate the amount of firewood consumed for the inventory's reference years. The amount of bagasse (biomass) was estimated using sugar cane production data obtained from INE. For international transport, data on fuel sales to foreign markets reported by oil companies and contained in the BE were used. The import figures for charcoal, paraffins, solvents and lubricants in the BE were obtained from INE.	CO_2 default emission factors (EF) were used according to IPCC (2006) and applied to each type of fuel consumed according to end use.
2. Industrial Processes and Product Uses		
Use of lubricants Use of paraffin wax	For lubricants, paraffin wax and solvents, the data was obtained from the energy balance matrix provided by the National Directorate for Industry, Trade and Energy (DNICE), based on import data provided by the National Statistics Institute.	The IPCC (2006) default EFs were used.
Refrigeration and air conditioning	The activity data used were annual imports of hydrofluorocarbon refrigerant gases (HFCs), obtained from the National Ozone Programme of the National Environment Directorate, the entity responsible for monitoring these gases in Cabo Verde.	The IPCC (2006) default EFs were used.

Categories	Activity data and sources	Emission factor (EF)
3. Agriculture		
Livestock		
Enteric fermentation Waste manage-ment	The activity data needed to estimate emissions from enteric fermentation and manure management is livestock data (number of heads for each species). Not having statistics for all the years under study and taking into account the inconsistency of existing statistical data (namely livestock data available from INE's statistical yearbooks and the MAA's Statistical Services), it was decided to estimate this data using the interpolation methodology.	The IPCC (2006) default EFs were used. As there are no country-specific emission factors, EFs applied to the African continent were used.
Application of urea	For the application of urea, the annual areas for agriculture were used, the result of the land use change matrix, obtained from the LULUCF sector inventory team. Bearing in mind that the amount of urea used per hectare is not known, the value used was 40kg/ha of urea use, obtained from (https://teses.usp.br/teses/disponiveis/11/11140/tde-07052019-180546/publico/Bruno_Paulo_Moschini_versao_revisada.pdf), which made it possible to estimate the total amount of urea for agriculture.	The IPCC (2006) EFs were used.
4. Land Use, Land Use Change and Forestry (LULUCF)		
3B. Forest and Other Land Uses (LULUCF)		
Forest Agriculture Grassland Flooded Area Urban Area Other land uses	The activity data used came from the map of land use change, trends in vegetation change and environmental disturbances and impacts, obtained through the visual interpretation of very high-resolution satellite images of 3281 plots distributed throughout the country, using the free software "Collect Earth (CE)", developed by the FAO Forestry Department, for the years 2000 to 2020. However, from 2004/2005 onwards, there were difficulties in obtaining high-resolution satellite images, so from 2005 onwards and to be able to reconstitute the series up to 1995, the estimated quantities of firewood removed were used to estimate the respective changes in land use, taking into account knowledge of the terrain and knowing the silvicultural behaviour of the species that most contributes to the country's firewood supply. To estimate firewood consumption, data on the percentage of the population using firewood in urban and rural areas (obtained from INE) was used to estimate the amount of the population using firewood, using statistical methods. The per capita consumption of firewood, obtained from previous studies carried out by the forestry sector, was used to estimate the amount of firewood consumed for the inventory's reference years. To estimate emissions due to forest fires, data on fires in the country from the DGASP and Civil Protection was used. No below-ground emissions or emissions from wood collection were estimated due to the lack of activity data to calculate estimates in these subsectors. According to the land use change matrix, in 2019 there was no change of use for agriculture and urban area, so emissions in these subsectors were considered zero (0) in the inventory table.	The IPCC (2006) default EFs were used.Agriculture

Categories	Activity data and sources	Emission factor (EF)
Aggregate Sources and Sources of Non-CO_2 Emissions in the soil		
Direct emissions of N_2O from managed soils	To estimate emissions due to the use of fertilisers in the soil, the fertiliser data provided by the Statistical Services of the Ministry of Agriculture and the Environment for the years 2018 to 2020 were used. To determine direct emissions from managed soils, the annual amount of N due to the application of fertilisers, all animal waste systems (obtained from livestock) and agricultural waste was considered. The amount of N from urine and waste deposited by animals on grassland was also considered. Indirect emissions due to N_2O by atmospheric deposition of volatilised N from soils were based on N from synthetic fertilisers, animal waste and urine and waste deposited by animals on grassland. Indirect emissions due to N_2O by atmospheric deposition of N leached from soils were estimated based on N from synthetic fertilisers, animal waste and urine and waste deposited by animals on grassland and agricultural waste.	
Indirect emissions of N_2O from managed soils		
Indirect emissions of N_2O from manure management		
4. Waste		
Solid waste disposal	The activity data used was from the INE (National Institute of Statistics) relating to the 1900-2010 population census, the 2010-2030 population projection and the 2021 population census. Regarding waste production, data from INE (file 2022_Cabo Verde_ Waste) and data from PENGER 2015 were used. Concerning the composition of solid waste, only data from 2015 was available, which was used for the entire historical series (which can lead to distortions).	The IPCC (2006) default EFs were used.
Incineration and open air burning of waste	In the incineration category, only data on health service waste was considered because there are no incinerators for municipal waste or industrial waste in the country. To calculate the estimates, the number of syringes imported was considered. Data on syringe imports from 2002 to 2019 was provided by the General Directorate of Customs. Using a regression from 2002 to 1995, the remaining figures were obtained. For open air burning of waste, the amount of collected waste deposited in municipal rubbish bins and the amount of uncollected waste burned were considered.	The IPCC (2006) default EFs were used.

Categories	Activity data and sources	Emission factor (EF)
Wastewater treatment and discharge	According to the information collected from the domestic Wastewater Treatment Plants (ETAR), the data was worked out by municipality and type of ETAR, as they have different emissions. The number of people served was identified (population of the island/municipality *connection rate), according to INE data, and the year of commissioning for each ETAR. In the absence of data on BOD5 per capita (Biochemical Oxygen Demand - BOD; g*hab-1/d) for the country, the value of 37 g/inhab/day (value for Africa) was taken as per IPCC table 6.4. To find out the amount of protein consumed per capita in Cabo Verde, information from the FAO was used via the link https://www.fao.org/faostat/en/#home. Using the data on the percentage of the population connected to the network and the percentage of the urban and rural population that uses nature to evacuate, obtained from INE, we arrived at the total percentage of the population that evacuates in nature. Only the population that uses systems other than nature emits N_2O. Regarding the treatment and discharge of industrial wastewater, emissions were calculated for the largest industries operating in the beverage production (beer) and fish processing sectors. The following data was used: • Data 2008-2019 Frescomar fish processing, 2023; data 1991-1999 Fisheries Resource Management Plan, 2004; • Data 2016-2019 fish processing Atunlo Company, 2023; • 2016-2022 beer production data for the Cavibel Company, 2023; • Data 1995, 2000, 2005, 2010, 2015 IPPU sector The industries' wastewater treatment plants were analysed, along with the year they came into operation and the type of treatment.	The IPCC (2006) default EFs were used.

Source: Compilation of the national GHG inventory

The estimated emissions of CH4, N2O and F-gases were converted into CO2, which is the gas used as a reference to estimate total emissions. The emission mass of each type of gas is multiplied by its Global Warming Potential (GWP) and the equivalent emission in CO2 is found. This inventory used the GWP values for the 100-year time horizon of the IPCC Second Assessment Report (SAR) (IPCC 1995).

Table 4 shows the Global Warming Potential (GWP) values used in this inventory. In the same table are the current GWP values defined in the IPCC's Fifth Assessment Report (AR5) (IPCC 2014), used to estimate national GHG emissions using the most up-to-date metric.

Table 4 - Type of gases and Global Warming Potential for 100 years

Gases	Symbol	SAR	AR5
Carbon dioxide	CO_2	1	1
Methane	CH_4	21	28
Nitrous oxide	N_2O	310	265
Hydrofluorocarbons	HFC-23	11.700	12.400
	HFC-32	650	677
	HFC-4310mee	1300	1.650
	HFC-125	2.800	3.170
	HFC-134a	1.300	1.300
	HFC-152a	140	138
	HFC-143a	3.800	4.800
	HFC-227ea	2900	3.350
	HFC-236fa	6300	8.060

2.4 GHG Emissions and Removals Results

Carbon dioxide (CO2) is the most significant greenhouse gas (GHG), accounting for around 73.3% of total national GHG emissions and removals in 2019, essentially due to the importance of the energy sector in Cabo Verde and the predominance of CO2 emissions as a result of burning fossil fuels.

Table 5 - Total GHG emissions and removals, in CO2eq, aggregated by year and by type of gas

Year	1995	2000	2005	2010	2015	2019	variation (2015 and 2019)	variation (1995 and 2019)
Gas	Gg CO_2eq							
CO_2	305,77	365,33	580,25	522,77	577,7	667,40	15,53%	118,27%
CH_4	77,55	79,39	90,71	115,57	167,8	146,03	-12,97%	88,30%
N_2O	18,23	17,08	65,95	71,21	104,09	72,03	-30,80%	295,12%
HFC	0,01	0,13	0,76	2,66	11,5	25,09	118,17%	250800,00%
Total	401,56	461,93	737,67	712,21	861,09	910,55	5,74%	126,75%

Source: Compilation of the national GHG inventory

In 2019, total CO2eq emissions are estimated at around 667.40 Gg, representing an increase of 118.27% compared to 1995, and 15.53% compared to 2015, essentially due to increased consumption of fossil fuels, mainly used for energy production and transport.

Methane (CH4) and nitrous oxide (N2O), which originate mainly in the agricultural and waste sectors, together accounted for around 23.9% of total emissions in 2019, corresponding to 218Gg CO2eq. Fluorinated gases (F-Gases) originate mainly from refrigeration and air conditioning systems in the Industrial Processes and Product Uses sector and in 2019 saw an increase of around 250-800% compared to 1995.

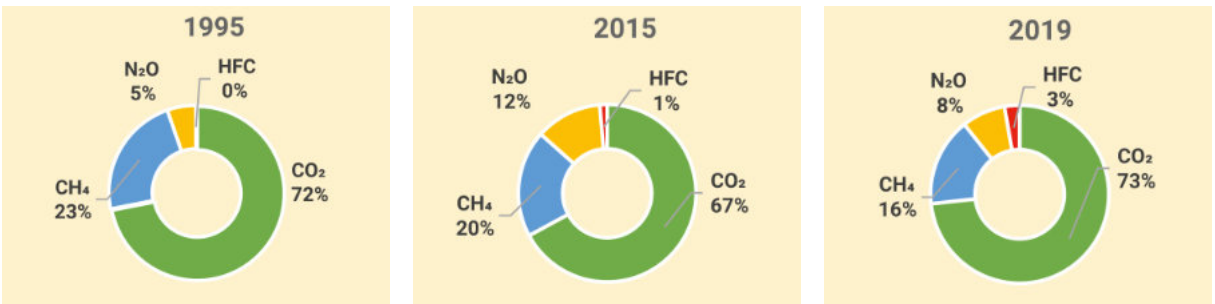


Figure 5 - Total emissions and removals by type of gases in 1995 and 2019

CO2 is the most significant gas in the years under analysis, with around 72% of total GHG emissions and removals in 1995, 67% in 2015 and around 73% in 2019, followed by CH4 with 23%, 20% and 16% respectively, essentially due to the livestock sector.

The following table gives an overview of emissions and removals by type of gas and by sector for the time series.

Table 6 - GHG emissions and removals by type of gas, by sector and by year

Sectors	Gases	1995	2000	2005	2010	2015	2019
		Gg					
Energy	CO_2	219,7494	288,5297	479,7149	509,602	518,6737	650,9141
	CH_4	0,1987	0,2158	0,2489	0,2698	0,2545	0,2672
	N_2O	0,0078	0,0095	0,0135	0,0138	0,0148	0,0178
IPPU	CO_2	0,3854	0,4565	0,6385	1,3191	0,9612	1,0135
	F-gases	0,000003	0,0001	0,0006	0,002	0,0058	0,0112
Agriculture	CO_2	NE	NE	2,0408	2,0444	2,0444	2,0408
	CH_4	1,9889	2,0944	2,1881	2,3645	2,5993	2,442
	N_2O	0,0315	0,0315	0,1804	0,1935	0,2138	0,1877
LULUCF	CO_2	18,668	25,325	43,640	-58,2872	-25,8354	-58,9773
	CH_4	NE	NE	0,0729	0,0071	1,4735	NE
	N_2O	NE	NE	0,004	0,0004	0,0815	NE
Waste	CO_2	66,9691	51,019	54,2202	68,0876	81,8577	72,4076
	CH_4	1,5051	1,4704	1,8095	2,862	3,6634	4,2445
	N_2O	0,0195	0,014	0,0148	0,022	0,0257	0,0269

Source: Compilation of the national GHG inventory

In 2019, total national emissions, including LULUCF, are estimated at around 910.74Gg CO2eq, representing an increase of approximately 127% compared to 1995 and approximately 6% compared to 2015.

Table 7 - Total GHG emissions and removals, in CO_{2eq}, aggregated by year and by sector

Year	1995	2000	2005	2010	2015	2019	Variation (2015 and 2019)	Variation (1995 and 2019)
Sectors	Gg CO_{2eq}							
Energy	226,35	296,01	489,13	519,56	528,61	662,03	25,24%	192,48%
IPPU	0,39	0,58	1,4	3,98	12,46	26,11	109,55%	6594,87%
Agriculture	51,53	55,8	103,91	111,68	122,9	111,5	-9,28%	116,38%
LULUCF	18,67	25,33	43,64	-58,02	30,38	-58,79	-293,53%	-414,90%
Waste	104,62	86,25	96,81	135,01	166,75	169,89	1,88%	62,39%
Total emissions with LULUCF	401,56	463,97	734,89	712,21	861,10	910,74	5,77%	126,80%
Total emissions without LULUCF	382,89	438,64	691,25	770,23	830,72	969,53	16,71%	153,21%

Source: Compilation of the national GHG inventory

According to the estimates, in 2019, national GHG emissions, without accounting for LULUCF emissions, are 969.53 Gg CO_{2eq}, corresponding to an increase of around 16.71% compared to 2015 and 153.21% compared to 1995, essentially due to the increase in emissions in the energy sector.

According to Table 7, in 2019 the energy sector represented around 72.71% of total national emissions, including LULUCF, followed by the waste and agriculture sectors with around 18.66% and 12.25% respectively.

In 2019, the Land Use, Land Use Change and Forestry (LULUCF) sector contributed around 58.98 Gg CO_{2eq} to the reduction in total national emissions, representing an increase in total CO_{2eq} reduction of around 414.90% compared to 1995, when the LULUCF sector contributed around 18.67 Gg CO_{2eq} to total national emissions. In 2015, the LULUCF sector contributed 30.38 Gg CO_{2eq} to total national emissions.

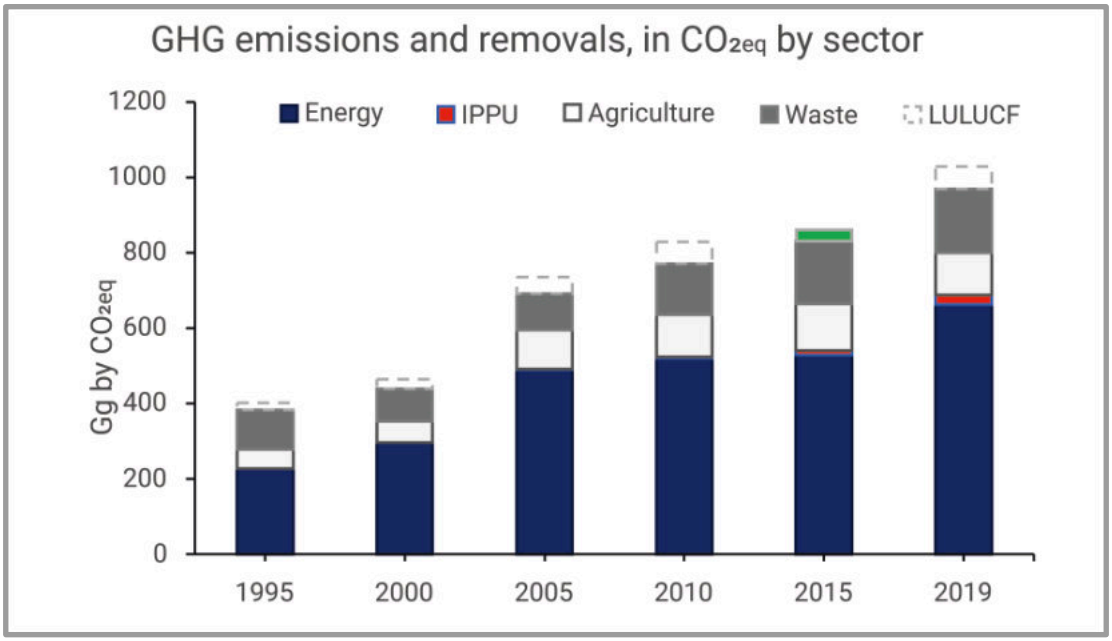


Figure 6 - GHG Emissions and Removals, in CO2eq by sector, in 1995, 2000, 2005, 2010, 2015 and 2019

The energy sector is, for the entire time series, the main contributor to GHG emissions in Cabo Verde, estimated at 662.03 Gg of CO_{2eq} in 2019, followed by the waste sector with around 170 Gg of CO_{2eq}.

The Land Use, Land Use Change and Forestry Sector (LULUCF) is the only sub-sector that can contribute to the removal of CO_2 emissions through the absorption of CO_2 by forests. In 2019, the LULUCF sector contributed to the removal 58.9 Gg of CO_2. Even so, total emissions in the Agriculture and LULUCF sectors are positive in 2019, having contributed around 52.71 Gg of CO_{2eq} to total national emissions, and representing a decrease of around 25% in removal capacity compared to 1995.

The livestock sector saw total emissions increase by around 116% in 2019 compared to 1995, with around 111.5 Gg of CO_2, essentially due to the contribution of enteric fermentation and direct emissions of N_2O from managed soils, which contributed around 42.7% and 32.3% respectively to total emissions in this sector.

The increase in GHG emissions in 2019 in the IPPU sector compared to 1995 (6674%) is essentially related to the growth in emissions of fluorinated gases, particularly in the refrigeration and air conditioning subsectors. The F-gases that contributed most to the increase in GHG emissions in 2019 in the IPPU sector were HFC 125 and HFC 143a, with 38.3% and 38.1% respectively of total emissions in this sector.

The following figure shows national emissions in 2019, without LULUCF, by sector with the respective breakdown by subsector.

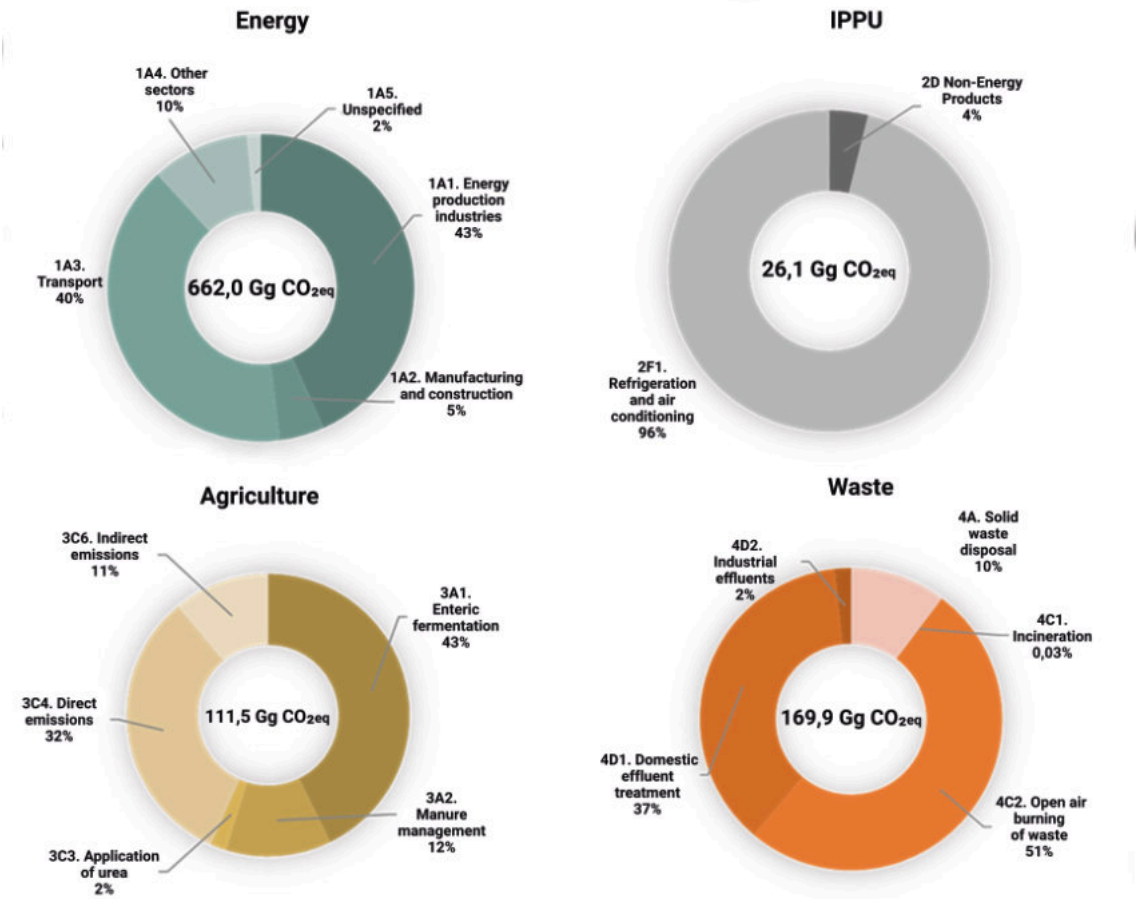


Figure 7 - GHG emissions in 2019, broken down by sector and subsectors, excluding LULUCF

According to Figure 7, in the energy sector, the energy production industry and transport together contributed around 83% of total emissions in this sector. Land transport is the largest contributor to emissions in the transport sub-sector with around 64.3% of total emissions in this sub-sector, followed by air transport with 26.8% and maritime transport with only 7.4%.

In the IPPU sector, 96.1% of total emissions come from the refrigeration and air conditioning subsector, which is responsible for emissions of fluorinated gases, also known as F-gases. The F-gases that contributed most to the increase in GHG emissions in 2019 in the IPPU sector were HFC 125 and HFC 143a, with 38.3% and 38.1% of total emissions in this sector, respectively.

Total emissions in 2019 in the agriculture sector were around 111.5 Gg CO_{2eq}, with enteric fermentation contributing the most to emissions in this sector with around 42.7% of total emissions. This was followed by direct emissions of N_2O with 32.3% and manure management with 12.1%. The remaining subsectors together totalled around 14.4 Gg CO_{2eq}, which corresponds to 12.9% of total emissions in this sector in 2019.

Open air burning of waste is the biggest contributor to total emissions in the waste sector, with around 50.8% corresponding to 86.4 Gg CO_{2eq}, followed by domestic effluent treatment with 63.1 Gg CO_{2eq} and solid waste disposal (deposition) with 17.4 Gg CO_{2eq}.

The following figure shows the behaviour of GHG emissions and removals in the Land Use, Land Use Change and Forestry sector for the entire time series, showing that in 2015 total emissions in this sector were positive, estimated at around 30.4 Gg CO_{2eq}. This behaviour is due to the relative intensity of forest fire episodes in the country, with a total burnt area of 1,540ha from 2011 to 2015, compared to just 489ha from 1990 to 2010.

In the remaining years, total emissions in the LULUCF sector contribute to the removal of CO_2 from total national GHG emissions. However, it should be emphasised that the estimates of emissions from firewood consumption contain some uncertainties due to the following aspects:

– There is no recent national firewood consumption survey; some regional studies were used to obtain the per capita/year consumption coefficient.

– The percentages of firewood use in urban and rural areas are a snapshot of the level of access to gas and firewood, but do not reflect the intensity of use. In fact, despite the considerable percentage of access to gas in rural areas, the intensity of its use is still relatively low, considering the price increases in recent years, which is why people prefer to cook with firewood, access to which is mostly free (self-consumption from forest perimeters and other areas of woody vegetation).

The urban and rural population totals used to estimate firewood consumption from 2011 to 2019 were projected by INE, before being corrected following the publication of the definitive results of the 2020/2021 Census. This will be corrected in the next National Communication.

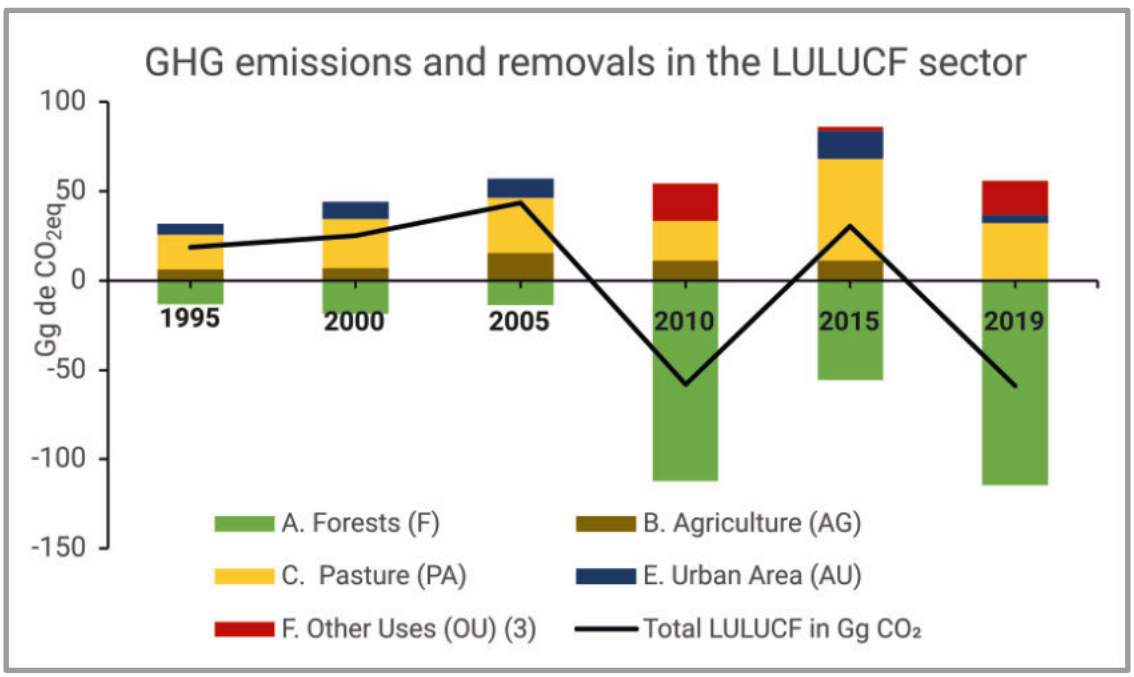


Figure 8 - GHG emissions and removals in the LULUCF sector, broken down by subsector in 2019

In the LULUCF sector in 2019, total emissions were recorded at around -58.9 Gg CO_{2eq}, with the Forestry subsector contributing around 114.8 Gg CO_{2eq} to the removal of emissions in the LULUCF sector.

The remaining subsectors contributed to GHG emissions in 2019, with the Grassland subsector contributing the most to these emissions, with around 32.2 Gg CO_{2eq} followed by other land uses with 19.1 Gg CO_{2eq}.

Annex B shows the sectoral GHG emissions tables for 2019.

The following table shows the national estimates for anthropogenic emissions by sources and removals by sinks of greenhouse gases for the year 2019, presented in accordance with the IPCC guidelines for presenting national GHG emissions for the BUR

Table 8 - Anthropogenic emissions by sources and removals by sinks of greenhouse gases in 2019

Categories by GHG sources and removals by sinks	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mixture of HFCs and PFCs	SF6	Total GHG equivalent emissions
(kt)				CO_2 equivalent (kt)			(kt)	CO_2 equivalent (kt) (2)
Total GHG emissions	667,3987	6,3794	0,2331	25,0948				898,7315
1. Total energy	650,9141	0,2672	0,0178					662,0306
1.A. Fuel combustion activities (sectoral approach)	650,9141	0,2672	0,0178	NO	NO	NO	NO	662,0306
1.A.1 Energy production industries	285,4341	0,0112	0,0022					286,3611
1.A.2 Manufacturing and construction	30,7865	0,0081	0,0012					31,3182
1.A.3 Transport	262,1149	0,0255	0,0112					266,1090
1.A.4. Other sectors	62,4790	0,2211	0,0031					68,0887
1.A.5 Other	10,0997	0,0014	0,0001					10,1536
2. Total industrial processes	1,0135	-	-	25,0948				26,1083
2.A. Mineral Industry							NO	-
2.B. Chemical industry								-
2.C. Metallurgical Industry								-
2.D. Non-energy fuel products and use of solvents	1,0135							1,0135
2.E. Electronics industry							NE	-
2.F. Use of products as substitutes for ozone-depleting substances				25,0948				25,0948
2.G. Manufacture and use of other products								-
3. Total agriculture	2,0408	2,4420	0,1884					111,7410
3.A. Enteric fermentation		2,2678						47,6244
3.B. Manure management		0,1742	0,0316					13,4625

Categories by GHG sources and removals by sinks	Net CO_2 emissions / removals	CH_4	N_2O	HFCs	PFCs	Unspecified mixture of HFCs and PFCs	SF6	Total GHG equivalent emissions
(kt)				CO2 equivalent (kt)			(kt)	CO_2 equivalent (kt) (2)
3.C. Rice cultivation		NO						
3.D. Agricultural soils				0,1568				48,6133
3.E. Prescribed burning of savannas		NO	NO					
3.F. Burning agricultural waste		NE	NE					
3.G. Liming								-
3.H. Application of urea	2,0408							2,0408
4. Total LULUCF	- 58,9773	-	-					- 58,9773
4.A. Forest	114,7567							114,7567
4.B. Agriculture	NE	NE	NE					
4.C. Grassland	32,2210							32,2210
4.D. Wetlands	NE	NE	NE					
4.E. Urban Area	4,5071							4,5071
4.F. Other Land Uses	19,0513							19,0513
4.G. Harvested wood products	NE	NE	NE					
4.H. Other *(please specify)*								-
5. Total waste	72,4076	3,6702	0,0269					157,8289
5.A. Disposal of solid waste		0,8302						17,4337
5.B. Biological treatment of solid waste		NO	NO					
5.C. Incineration and open air burning of waste	72,4076	0,4970	0,0115					86,4006
5.D. Wastewater treatment and discharge		2,3430	0,0155					53,9947

Source: Compilation of the national GHG inventory.

(1) In subsector 3B2.Agriculture, CO2 emissions were considered NA because there was no change in land use in this subsector.

(2) In subsector 3B4. Wetlands, CO2 emissions were considered NA because there was no change in land use in this subsector.

2.4.1 Emissions for international *bunkers*

According to the IPCC 2006 guidelines, GHG emissions resulting from international exports of aviation and shipping fuels are considered international bunkers and are not counted in the country's total emissions and removals but must be estimated and reported separately in the inventory. The following table reports Cabo Verde's contributions to international bunkers for the entire time series (1995, 2000, 2005, 2010, 2015 and 2019).

Table 9 - Total GHG Emissions, in CO_{2eq}, for international bunkers, in 1995, 2000, 2005, 2010, 2015 and 2019

Emissions due to International *Bunkers*	1995	2000	2005	2010	2015	2019	Variation (1995 and 2019)
	Gg CO_{2eq}						
Total International *Bunkers*	239,50	293,55	360,27	279,25	479,48	887,40	271%
International aviation	216,69	205,42	209,90	140,28	179,09	313,30	45%
International shipping	22,81	88,13	150,37	138,97	300,40	574,10	2417%

Source: Compilation of the national GHG inventory

The country's contribution to CO_2 emissions in International Bunkers increased by 271% in 2019 compared to 1995, with the biggest increase coming from the international shipping activity with a 2417% increase in 2019 compared to 1995, reflecting the increase in vessels passing through the country's ports.

2.5 Comparison between reference and sectoral approaches in the energy sector

According to the IPCC 2006 guidelines, the calculation of GHG emissions due to the burning of fossil fuels in the energy sector should be estimated using two approaches: Reference Approach (top-down methodology) and Sectoral Approach (bottom-up methodology). In national inventories, GHG emissions in the energy sector are estimated using the Sectoral Approach.

Emissions, using the Reference Approach, are estimated from aggregate data on gross fuel supply. To do this, fuel production and imports are added together and fuel exports to international bunkers (aviation and shipping) and stock changes (which can be positive or negative) are subtracted. Based on this result and on the carbon content of each type of fuel, CO_2 emissions are estimated.

For the Sectoral Approach, information on the consumption of each type of fuel by sector is used and multiplied by the corresponding emission factors. Calculating CO_2 emissions with the two approaches can lead to different results. This estimate is used as a quality control of the energy sector's results.

Table 10 - Comparison between reference and sectoral approaches in the energy sector

Year	Reference Approach (A) Gg CO_2	Sectoral Approach (B) (Gg CO_2)	Difference (%) (A-B)/B
1995	219,66	219,75	-0,04%
2000	287,77	288,53	-0,26%
2005	482,31	479,71	0,54%
2010	510,71	509,60	0,22%
2015	521,73	518,67	0,59%
2019	659,19	650,91	1,27%

Source: Energy sector GHG inventory report

In the inventory, differences of less than 5% were observed for the entire estimated time series, as shown in Table 10. For the years 1995 and 2000, the difference between the approaches is negative, justified essentially by the statistical adjustments made to the Energy Balances, namely the stock variation.

2.6 Comparison of total emissions between the GWP-SAR and GWP-AR5 metrics

Total national GHG emissions, by type of gas, estimated using the GWP - AR5 in 2019, were estimated at around 952.6 Gg CO_{2eq}, 4.6% higher than the estimates with the GWP - SAR for the same year.

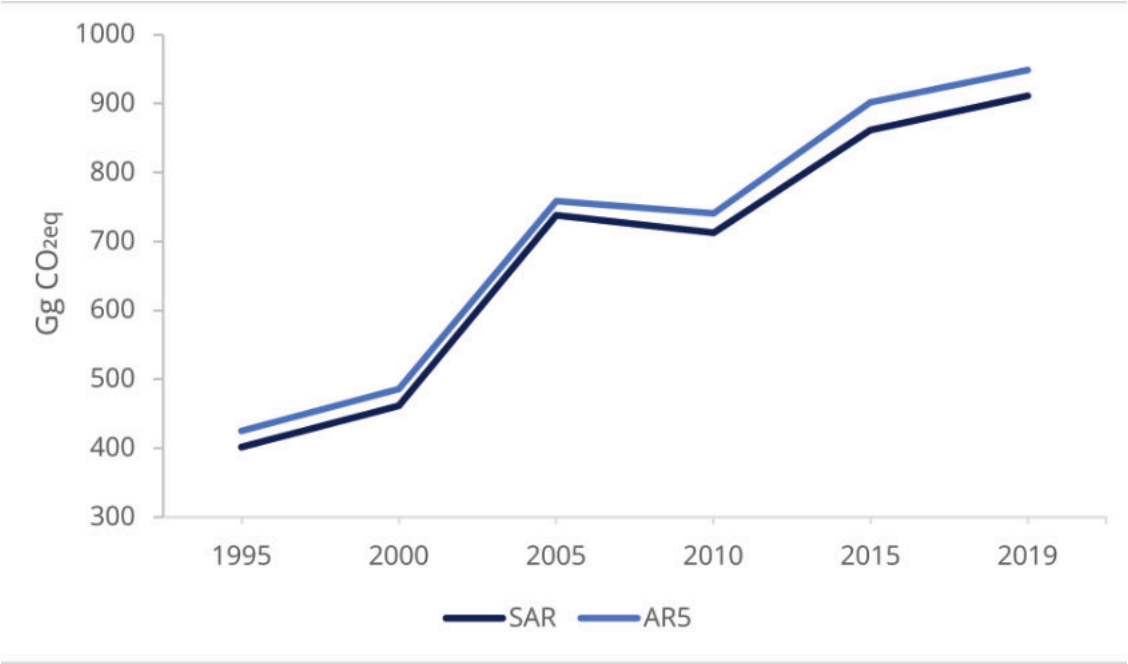


Figure 9 - Total GHG emissions and removals, in CO_{2eq} and by two metrics (SAR and AR5), per year, with LULUCF

The following table shows a comparison of total GHG emissions and removals, in CO_2 and by two metrics (SAR and AR5), for the entire time series, including LULUCF emissions.

Table 11 - Total GHG emissions and removals, in CO_{2eq} by two metrics (SAR and AR5), per year, with LULUCF

Year	1995	2000	2005	2010	2015	2019
Metrics	Gg CO_{2eq}					
PAG - SAR	401,56	461,90	737,66	712,20	861,10	910,56
PAG -AR5	424,76	485,89	758,32	740,39	901,93	948,78
Difference (%)	5,78%	5,19%	2,80%	3,96%	4,74%	4,20%

Source: Compilation of the national GHG inventory

2.7 Indicators

The following figure shows the evolution of GHG emissions per capita. In 2019 each person in the country emitted around 1.82 tCO_{2eq}, representing an increase of 106% compared to 1995. Compared to 2015, the increase in per capita emissions was 4% in 2019.

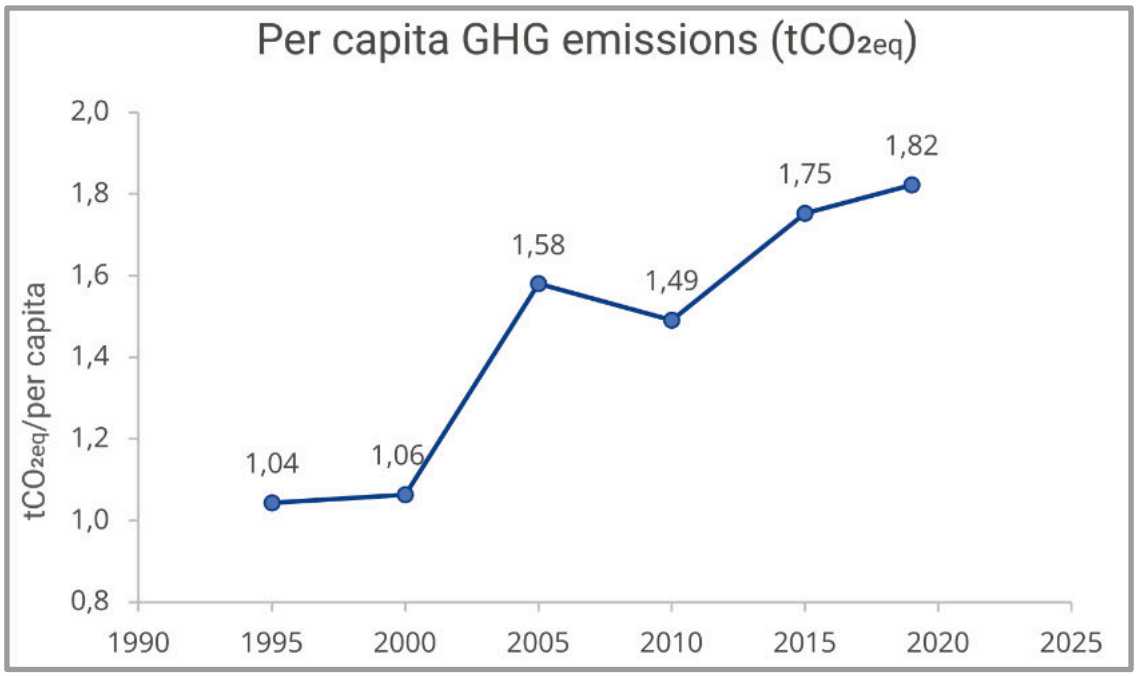


Figure 10 - Evolution of emissions per capita, in tonnes CO_{2eq}/capita

2.8 Uncertainty analysis

The calculation of the estimates of GHG emissions and removals made in this inventory are subject to uncertainties due to various causes, ranging from the inaccuracy of the activity data used, poor knowledge of the processes that give rise to GHG emissions or removals and the use of default emission factors defined by the IPCC.

To estimate the uncertainties in this inventory, the IPCC's Good Practices and Uncertainty Management in National GHG Emissions Inventories guidelines were applied to guarantee the transparency, coherence, comparability, completeness, and reliability of the national GHG emissions inventory.

The total uncertainties for this inventory were 8.5%.

Annex C details the uncertainty calculations for the 2019 national inventory of GHG emissions and removals.

2.9 Analysis of Key Categories

The IPCC guidelines recommend carrying out a key category analysis for the national GHG inventory to identify the main categories of GHG emission sources that are most relevant, so that the resources available for the preparation of the inventory can be used more efficiently, thus improving the estimates of GHG emissions for these main sources identified.

The analysis of the key categories carried out for this inventory followed the 2006 IPCC guidelines for emission sources, in terms of CO2 equivalent emissions and using the tier 1 approach by assessing the base year level, whose emissions added together in descending order of magnitude add up to 95% of total national GHG emissions.

A total of 21 key categories were identified by assessing the base year level, including LULUCF. The categories identified are listed in the following table, which add up to 95%. The categories of energy production industries, transport and land transport, and forestry stand out as the categories prioritised for refinement of GHG emissions and removals.

Table 12 - Analysis of key categories of national GHG emissions using the base year level assessment

Emission source categories	Gases	CO_{2eq} emissions 2019	Cumulative	Percentage
1A1. Energy production industries	CO_2	285,4341	285,4341	25,04%
1A.3.b. Land transport	CO_2	167,8750	453,3091	39,76%
3B1. Forest	CO_2	114,7567	568,0658	49,83%
4C.2 Open air burning of waste	CO_2	72,3650	640,4308	56,17%
1A3.a - Air transport	CO_2	70,7200	711,1507	62,38%
4D.1 Domestic effluents	CH_4	58,3247	769,4754	67,49%
3A1. Enteric fermentation	CH_4	47,6244	817,0998	71,67%
1A4.b. Residential	CO_2	37,2877	854,3875	74,94%
3C4. Direct emissions of N_2O from managed soils	N_2O	36,0565	890,4440	78,10%
3B3. Grassland	CO_2	32,2210	922,6650	80,93%
2F1. Refrigeration and air conditioning	HFC	25,0948	947,7597	83,13%
1A.3.c Maritime Transport	CO_2	19,4928	967,2526	84,84%
3B6. Other uses	CO_2	19,0513	986,3039	86,51%
4A. Disposal of solid waste	CH_4	17,4337	1003,7376	88,04%
1.A.2.m - Unspecified industry	CO_2	16,1685	1019,9061	89,46%
1A.2.k - Construction	CO_2	14,6179	1034,5240	90,74%
1A4.c. Agriculture/Forestry/Fishing	CO_2	12,6505	1047,1745	91,85%
1.A.4.a Commercial/Institutional	CO_2	12,5409	1059,7154	92,95%
3C6. Indirect emissions of N_2O from manure management	N_2O	12,2419	1071,9573	94,03%
4C.2 Open air burning of waste	CH_4	10,4374	1082,3947	94,94%
1A5. Not specified	CO_2	10,0997	1092,4943	95,83%

The total result of the analysis of the key categories, using the full base year level assessment, can be found in Appendix D.

2.10 Quality control and assurance

To guarantee the quality control (QC) of the national inventory in 2019, in accordance with the IPCC's recommendations for good practice in quality control, checks were carried out on the methodology, activity data, emission factors and calculations during all stages of the inventory's

preparation by international experts and the technical compilation team for the compilation phase of the national inventory.

The quality assurance (QA) of the inventory was observed by holding a national workshop with experts not directly involved with the preparation of the national inventory, as well as the general public with an interest. The comments, suggestions and recommendations resulting from the national workshop were recorded and incorporated into the calculations and reports where necessary.

2.11 Storage and dissemination

The sectoral and national inventories were structured and filed in spreadsheet format and stored at the Ministry of Agriculture and the Environment, more specifically at the National Directorate for the Environment. The sectoral reports, which contain the methodological details and the results of the estimates of GHG emissions and removals, have also been archived at the MAA/DNA. The national inventory is publicly available on the MAA's website and in paper format via a booklet to be distributed to the various partners, institutions, universities, and others.

2.12 Gaps, barriers and recommendations

The following table summarises the main gaps and barriers encountered during the GHG inventory process, identified by sector. The table also presents recommendations for improving the gaps identified.

Table 13 - Gaps, barriers and recommendations

Sector	Gap	Barrier	Recommendations
Energy LULUCF	Lack of up-to-date data on the production and consumption of firewood and charcoal.	Limited resources for research and technological development to collect data on firewood and charcoal.	Financial support for a national inventory of firewood and charcoal consumption.
Energy Agriculture	Lack of data on the production and consumption of sugarcane bagasse for energy, livestock and agricultural purposes. There is a lack of data on the areas burnt before the land is prepared for rainfed crops.	Limited resources for research and technological development to collect data on sugarcane bagasse.	Financial support for a national inventory of sugarcane bagasse production and consumption.
Energy IPPU Agriculture /LULUCF/ Waste	Limitation of preliminary harmonised information for the development of the national GHG inventory.	The variety of data and its dispersion among various institutions and companies make it difficult and slow down the preparation of the INGEE.	Creation of systematic data collection processes and methodology (annually), and financial support for the creation of a national data collection system/platform for INGEE.

Sector	Gap	Barrier	Recommendations
LULUCF	Lack of more detailed data obtained on site and from images to determine the matrix of land use change, data on carbon stocks below ground, above ground, and dead wood.	National territory scattered across islands makes it difficult to verify and validate information. Limited resources (human and financial) for acquiring material and travelling around the country.	Technological and training support for the collection and processing of satellite images, including for universities in the development of scientific knowledge.
LULUCF	Lack of sufficient national capacity to collect and process forestry data using satellite images.	Limited resources (financial and human) for collecting and analysing spatial data.	Technological and capacity building support for the collection and processing of satellite images.
Energy IPPU Agriculture/ LULUCF Waste	Insufficient technical and scientific production of the parameters needed to estimate sectoral GHG emissions.	Limited resources (financial and human) for research and technological development by universities.	Financial and capacity support for the scientific community to estimate emission factors and national parameters in the various sectors.
Energy IPPU Agriculture/ LULUCF Waste	Insufficient national inventory experts with the capacity to estimate national GHG emissions and removals.	Limited financial and human resources for the development of the national GHG inventory.	Institutional strengthening in terms of training more national experts to prepare the INGEE. Raising awareness of data supply institutions to the importance of providing information for GHG estimation.
Energy IPPU Agriculture/ LULUCF Waste	Little official information is systematised, organised or available in time for the inventory to be drawn up.	Lack of legal support defining the duties and operation of a national system for the country's national emissions inventory.	Creation of national procedures for preparing INGEE.
Waste	Lack of systematised data on wastewater treatment plants (status; effluent characteristics; sludge).	Limited resources (financial and human) to collect systematic data on the country's existing wastewater treatment plants.	Financial support for the operationalisation and upgrade, with new functionalities, of the waste information system and support for municipalities in data collection. Support for the purchase of materials and training in using and entering data into the system.

3. Mitigation Measures

3.1 Mitigation actions and domestic MRV system for these actions

This chapter presents information on some of the Mitigation Actions implemented in Cabo Verde in the period that varies according to the year in which each action is implemented and extends to 2022, where possible. This set of actions contributes to reducing national greenhouse gas emissions, in line with national mitigation strategies, thus contributing to international efforts to mitigate climate change.

Cabo Verde's efforts have been ongoing since 2009, with the creation of the Interministerial Committee for Climate Change (Resolution 16/2009), approved with the aim of improving climate change monitoring in the country. This Committee also functions as the Designated National Authority to coordinate government actions with those arising from the UNFCCC, its Subsidiary Bodies, the Kyoto Protocol, and the IPCC.

In order to accelerate the mitigation of climate change, important instruments and mechanisms have been developed that allow this acceleration, namely:

✓ The Master Plan for the Electricity Sector 2017-2030, with the aim of maximising renewable energies in the energy matrix;

✓ A policy charter for electric mobility, the aim of which is to gradually replace the current fleet of vehicles equipped with thermal engines (petrol or diesel) with clean electric vehicles by 2050;

✓ The National Programme for Energy Sustainability (PNSE) for the period 2021 to 2026, with the aim of making the transition to a secure, efficient and sustainable energy sector, without dependence on fossil fuels, guaranteeing universal access and energy security, and explicitly committing to the Energy Transition and the Decarbonisation of the Economy by 2050;

✓ The National Strategic Plan for Waste Management (PENGeR), for the period 2016 to 2030;

✓ The publication of legislation specifying the institutional arrangement for drawing up the National Inventory of Emissions and Removals of Greenhouse Gases of Anthropogenic Origin (INGEE), through Resolution 37/2022 of 7 April;

✓ The Action Plan to Reduce CO2 in International Aviation in Cabo Verde, from 2019 to 2025.

Other initiatives are already underway, such as the preparation of Cabo Verde's Long-Term Low Emissions Development Strategy (LT-LEDS CV 2050), the creation of the legal framework for the Climate Law and the design of the national transparency system.

The following table shows the Mitigation Actions, mostly for the energy sector, as this is the sector that contributes the most to total national greenhouse gas emissions. The Mitigation Actions listed relate to actions implemented in Cabo Verde in a period that varies according to the year in which each action begins and extends to 2022, where possible. This set of actions contributes to reducing national greenhouse gas emissions, in line with national mitigation strategies, thus contributing to international efforts to mitigate climate change.

Name and description of the action	**Energy Efficiency in Buildings and Equipment Programme** The National Energy Sustainability Programme (PNSE) has the long-term strategy of making the transition to a secure, efficient and sustainable energy sector, without dependence on fossil fuels, guaranteeing universal access and energy security, and explicitly commits to the Energy Transition and the Decarbonisation of the Economy by 2050. One of the PNSE's main areas of intervention is the promotion of energy efficiency. Cabo Verde has defined well-established goals and plans to achieve increased energy efficiency, such as the promotion of more efficient buildings, energy labelling of electrical equipment, the promotion of energy efficiency in energy-intensive consumers and the development of the energy services market.
Cover	Sector: Energy Gases: CO_{2eq}
Period	2015 - 2020
Objectives	The main objective is to promote the reduction of electricity consumption through energy efficiency, starting with the introduction of a new law on building codes and for household appliances, through the introduction of a labelling programme, new import regulations, testing and certification procedures leading to significant improvements in energy efficiency in the country.
Progress Indicators	• Energy efficiency code for buildings has been drawn up and approved (see https://eficienciaenergetica.cv/index.php/sobre/edificios) • Certification and labelling mechanisms (MEPS) have been drawn up and approved to promote energy-efficient end use for the following equipment: light bulbs, refrigerators, air conditioning; washing machines and water heaters. (https://eficienciaenergetica.cv/index.php/sobre/equipamentos/etiquetagem) • Through pilot demonstration projects, some public buildings have been improved with energy-efficient solutions through improvements to electrical installations, the introduction of efficient equipment (light bulbs and air conditioning) and the installation of micro-production systems to help reduce electricity bills; • Training actions and the dissemination of lessons learned through videos, school programmes and television programmes in various communities. • Reducing energy consumption in the construction sector and demonstration projects through energy efficiency; • Increase number of buildings complying with the building energy efficiency code; • Direct CO_2 reductions resulting from energy efficiency in buildings and demonstration projects; • Increased sales of efficient imported household appliances; • Energy savings resulting from energy-efficient appliances and CO_2 reductions resulting from the use of efficient equipment
Methodologies / Hypotheses	Not Available
Measures taken/ planned	The project has been grouped into four (4) components, each made up of a series of complementary activities designed to achieve the project's goal. The main components are: • Component 1: Policy, institutional and legislative framework favourable to energy efficiency in buildings. • Component 2: Favourable energy efficiency improvements through S&L for household appliances. • Component 3: Energy efficiency solutions in a selection of public buildings through pilot demonstration projects. • Component 4: Multiplication and dissemination of lessons learnt and best practices.

Results obtained	Not Available		
Estimated emission reductions (if possible)	297.8 $ktCO_2$ (2015 -2020)		
Information about MRV domestic share	Institutions, entities, arrangements and systems involved in MRV	Approach to operationalising action measurement	Approach to operationalising action verification
	The project was implemented by a national implementation project team in close collaboration with the National Directorate for Industry, Trade and Energy (DNICE) as the beneficiary of the project. There are various organisations that are an integral part of the process, including the National Directorate for the Environment, the Directorate for Industry and Trade, the National Institute for Territorial Management (INGT), universities, operators in the electricity sector, civil engineering laboratories, among others.	This project was implemented by a national implementation team, in accordance with the activities envisaged in the project. The implementation team collects the information needed to monitor the project's progress indicators and a progress report is drawn up annually, including indicators relating to the estimated GHG emissions from the implementation of the activities.	The National Coordinating Council, chaired by DNICE and the National Project Director, was responsible for validating the annual report and approving the activities for the following year. This Council was made up of various organisations and members of the government. Two specialised committees were set up for technical validation, comprising bodies with technical knowledge, namely universities, the architects and engineers' association and ministerial experts. Technical committee for energy efficiency in buildings and technical committee for energy efficiency in equipment, responsible for the technical validation of all the documents provided for in the project.

Name and description of the action	**Efficient street lighting** The National Programme for Energy Sustainability (PNSE) identifies energy efficiency as one of the fundamental tools for promoting the energy transition, through the operationalisation of instruments to accelerate energy efficiency. It is in this context that the project to improve energy efficiency and reinforce public lighting arose.
Cover	Sector: Energy Gases: CO_2
Period	2018 - 2020
Objectives	Improving energy efficiency, reinforcing, and extending public lighting in the cities of Praia and Santa Maria.
Progress Indicators	Reduction of electricity consumption in public lighting (kwh)
Methodologies /Hypotheses	Not Available

Measures taken/planned	Replacement of inefficient luminaires with efficient luminaires (LED) in a first phase in the main cities.		
Results obtained	• Replacement of 8739 inefficient luminaires with 8739 LED luminaires. • An increase of 1,328 new LED luminaires, with network extensions and all the necessary accessories.		
Estimated emission reductions (if possible)	Not Available		
Information about MRV domestic share	Institutions, entities, arrangements and systems involved in MRV	Approach to operationalising action measurement	Approach to operationalising action verification
	Involvement of the various electricity sector operators in the project, together with DNICE. Electra and the Tourism Fund also participated in the project.	This project has been implemented by the electricity sector operator. Monitoring of project progress indicators and reporting of benefits.	DNICE, together with ELECTRA, is responsible for checking and validating the project.

Name and description of the action	**Access to Sustainable Energy for Water Management: Energy-Water Nexus.** The "Access to Sustainable Energy for Water Management: Energy-Water Nexus" project materialises the guidelines set out in the Strategic Plan for Sustainable Development (PEDS) with regard to energy and water and aims to make the transition to a secure, efficient and sustainable energy sector, without dependence on fossil fuels, guaranteeing universal access and energy security, and explicitly commits to the Energy Transition and Decarbonisation of the Economy by 2050. The project falls within the scope of the national energy transition strategy, promoting the commercial use of renewable energy (RE) and energy efficiency (EE) technologies in water production systems, while supporting the development of a comprehensive network of energy service companies (ESE).
Cover	Sector: Energy and Water Gases: CO_2
Period	2020 - 2023
Objectives	The main objective of the action is to catalyse the transition to sustainable practices in water production by promoting the commercial use of RE and EE technologies in desalination and water pumping systems and the development of Energy Service Companies (ESE). The main objectives are: • Reduce dependence on fossil fuels for electricity production; • Improve access to water and energy; • Install a total of 3.6 MW of RE associated with energy-water nexus projects; • Reduce GHG emissions by around 626,915 tonnes of CO2; • Disseminate and raise awareness of RE and EE technologies and their application in water management; • Leverage significant co-financing with only USD 1.8 million from the GEF; • Integrate gender issues into the development and operation of energy-water nexus projects. • Contribute to increased job creation by improving access to water and energy.

<table>
<tr><td>Progress Indicators</td><td colspan="3">The main indicators of progress are:
• Dependence on fossil fuels for electricity production;
• Index of access to water and energy;
• Total MW of RE associated with energy-water nexus projects;
• GHG emissions (tonnes of CO2)
• Level of awareness of RE and EE technologies and their application in water management;
• GEF leveraged co-financing (in millions of USD);
• Integration of gender issues into the development and operation of energy-water nexus projects.
• Contribution to increased job creation by improving access to water and energy.</td></tr>
<tr><td>Methodologies /Hypotheses</td><td colspan="3">Not Available</td></tr>
<tr><td>Measures taken/planned</td><td colspan="3">The project has been grouped into three (3) components, each made up of a series of complementary activities aimed at achieving the project's goal. The main components are:
Component 1 - Creating a favourable policy and institutional framework to promote the Energy-Water nexus;
Component 2 - Capacity building to support the integration of RE and EE technologies in water resources management;
Component 3 - Demonstration and replication of investment in RE and EE projects for water resource management;
More information is available at https://www.portalenergia.cv/nexoenergiaagua</td></tr>
<tr><td>Results obtained</td><td colspan="3">Not Available</td></tr>
<tr><td>Estimated emission reductions (if possible)</td><td colspan="3">626.9 kt of CO_2</td></tr>
<tr><td rowspan="2">Information about MRV domestic share</td><td>Institutions, entities, arrangements and systems involved in MRV</td><td>Approach to operationalising action measurement</td><td>Approach to operationalising action verification</td></tr>
<tr><td>The project was implemented by UNIDO in close collaboration with the National Directorate for Industry, Trade and Energy (DNICE) as the beneficiary of the project.
There are various entities that are an integral part of the project, including the National Directorate for the Environment, the Directorate for Industry and Trade, the National Water Agency, CERMI, the ECOWAS Centre for Renewable Energies (ECREE).</td><td>This project was implemented by a national implementation team (UNIDO+DNICE), in accordance with the activities envisaged in the project. The implementa-tion team collects the information needed to monitor the project's progress indicators and a progress report is drawn up every year, analysing indicators relating to the estimated GHG emissions from the implementation of the activities.</td><td>The actions are verified by a steering committee responsible for validating the annual report and approving the activities for the following year. The steering committee is made up of various organisations and members of the government, appointed by order of the National Director for Industry, Trade and Energy, who coordinates the steering committee.</td></tr>
</table>

Name of action	**Sustainable mobility** Through the project "Promoting Electric Mobility in Cabo Verde (ProMEC)", the government aims to promote electric vehicles (EVs) in order to achieve a significant share of EVs in Cabo Verde's vehicle fleet, in line with the country's strategic vision materialised in the Electric Mobility Policy Charter (CPME) and the Electric Mobility Action Plan (PAME), thereby contributing to reducing dependence on fossil fuels and cutting greenhouse gas (GHG) emissions.
Cover	Sector: transport Gases: CO_2, CH_4, N_2O
Period	2021 - 2025
Objectives	1. Support the purchase of 600 electric vehicles and 100 WallBox-type charging stations; 2. Establishment of a public charging network with at least 40 charging stations; 3. Implementation of Pilot Projects by supplying electric buses to: • Urban passenger transport in the cities of Praia and Mindelo, with 2 electric buses each; • School transport, with a maximum of 3 buses;
Progress Indicators	Number of electric vehicles added to the national vehicle fleet. Reduced GHG emissions (tCO2) due to the use of electric vehicles financed under the project. More information on indicators is available at www.portalenergia.cv/promec.
Methodologies /Hypotheses	Not Available
Measures taken/planned	The project has 8 components: 1. Incentive programme to support the purchase of 600 electric vehicles and 100 WallBox-type charging stations; 2. Establishment of a public charging network with at least 40 charging stations; 3. Development of the legal and regulatory framework for EVs, charging stations and EV charging station operators; 4. Implementation of pilot projects through the supply of electric buses for: • Urban passenger transport in the cities of Praia and Mindelo, with 2 electric buses each; • School transport, with a maximum of 3 buses; 5. Training for professionals in the sector, including international knowledge exchange; 6. Monitoring and reporting of GHG emissions related to road transport; 7. Raising awareness of the general population; 8. Integration of electric vehicle charging into the electricity grid.
Results obtained	Not Available
Estimated emission reductions (if possible)	Expected reductions: electric vehicles allow for the reduction of around 19,890 tCO_2 related to road transport directly, and, indirectly, the reduction of around 401,481 tCO_2;

	Institutions, entities, arrangements and systems involved in MRV	Approach to operationalising action measurement	Approach to operationalising action verification
Information about MRV domestic share	The ProMEC project is implemented by the German Agency for International Cooperation (GIZ), through a national implementation team in close collaboration with the National Directorate for Industry, Trade and Energy (DNICE) as the beneficiary of the project. There are several entities that are an integral part of the process, namely the National Directorate for the Environment, the General Directorate for Road Transport, DNICE, the Ministry of Finance and the Association of Municipalities and ProMEC.	The ProMEC project is implemented by GIZ, through a national implementation team, in accordance with the activity plans drawn up annually in line with the project guidelines. The implementation team (GIZ and DNICE) collects the information needed to monitor the project's progress indicators and a progress report is drawn up every year, analysing indicators relating to the estimated GHG emissions from the implementation of the activities.	The actions under ProMEC are verified annually by the steering committee, approved by order of the Director of DNICE, who approves and validates the actions implemented.

Source: National Directorate of Industry, Trade and Energy

Name of action	**Increased use of renewable energies in electricity production** According to current legislation, the allocation of reception capacity is done in two ways: through simplified tenders for the allocation of power; or through the allocation of capacity at the request of the interested party. In this way, tenders are organised with the aim of, among other things, contracting energy at the lowest possible price. Decree-Law no. 1/2011, updated in 2018 and republished through Decree-Law no. 54/2018, clarified the process of licensing and operating independent production and self-production of electricity based on renewable energy sources, namely regulating the registration of microproduction systems and the procedure for supplying surplus to the grid.
Cover	Sector: Energy Gases: CO_2, CH_4, N_2O
Period	2010 – 2022
Objectives	General objective: Increasing the installed capacity of solar sources in the national electricity matrix. Specific objective: To promote the inclusion of solar photovoltaic plants in the national electricity system, including distributed generation: Installation of a 5 MW solar photovoltaic park on the island of Sal. • Installation of a 5 MW photovoltaic solar park on the island of S. Vicente; • Increase in distributed generation capacity of 15 MW; • Installation of photovoltaic solar parks on the islands of Santo Antão -1.2 MWp, São Nicolau - 0.4 MWp, Maio - 0.4 MWp and Fogo - 1.3 MWp
Progress Indicators	Increase in installed capacity of solar photovoltaic plants (MW)

Methodologies/ Hypotheses	Not Available		
Measures taken/ planned	Three tenders have been launched, in different formats, for the allocation of reception capacity for photovoltaic solar power plants on different islands (see tenders at www.energiasrenovaveis.cv/concursosipp).		
Results obtained	Not Available		
Estimated emission reductions (if possible)	Not Available		
Information about MRV domestic share	Institutions, entities, arrangements, and systems involved in MRV	Approach to operationalising action measurement	Approach to operationalising action verification
	The call for tenders is the responsibility of DNICE in collaboration with other organisations, including operators in the electricity sector, the regulatory sector, and other interested parties.	The planned actions are implemented in accordance with the legislation in force and in line with public procurement procedures, through a procedures committee.	Verification of the implementation and operationalisation of the tendering processes is carried out by an evaluation committee appointed by order of the National Director, as well as by the monitoring team to follow the entire process of installing the plants.

Source: National Directorate of Industry, Trade and Energy

Name and description of the action	**REFLOR - Strengthening the capacity for adaptation and resilience in Cabo Verde's forestry sector** The national-level project, which supports economic growth and environmental sustainability, also aims to promote participatory forest management to adapt to climate change-induced desertification and build the resilience of target communities on the islands of Santiago, Fogo and Boa Vista.
Cover	Sector: Forest Gases: CO_2
Period	2017 - 2022
Objectives	The implementation of the project aims to: • Increase the resilience and capacity to adapt to climate change of rural communities on the islands of Santiago, Fogo and Boa Vista, promoting participatory forest management to adapt to desertification; • Contribute around 10% to the national commitment to afforestation and CO_2 removal; • Preserving biodiversity, reducing habitat loss and encouraging the natural regeneration of terrestrial ecosystems.
Progress indicators	• Woody vegetation cover • Soil conservation and species diversification • Community empowerment, integration and accountability • Technical training for institutions • Raising awareness and involving society, including gender and inclusion issues • Implementation of public policies

<table>
<tr><td>Methodologies/ /Hypotheses</td><td colspan="3">Not Available</td></tr>
<tr><td>Measures taken/planned</td><td colspan="3">The project was grouped into three (3) components:
• Integrating climate change issues into institutional policies, programmes and activities;
• Reducing desertification and degradation through reforestation and renaturalisation;
• Analysing and disseminating knowledge and lessons learnt.</td></tr>
<tr><td>Results obtained</td><td colspan="3">Not Available</td></tr>
<tr><td>Estimated emission reductions (if possible)</td><td colspan="3">Not Available</td></tr>
<tr><td rowspan="2">Information about MRV domestic share</td><td>Institutions, entities, arrangements, and systems involved in MRV</td><td>Approach to operationalising action measurement</td><td>Approach to operationalising action verification</td></tr>
<tr><td>In order to achieve the project's results, an integrated landscape approach was used, in which all the key players were integrated and multidisciplinary technical teams were formed. Four teams were set up: Planning, Safeguards, Monitoring and Forest Governance.</td><td>This project was implemented by a national team in accordance with the planned activities. The implementation team was supported by technical teams, made up of representatives of the project's partner public organisations, with defined work plans and regular meetings on the implementation of activities.</td><td>The actions are checked by a steering committee responsible for validating the annual report and approving the activities for the following year.
The results of the plantations were evaluated with representative samples and survival rates were estimated.</td></tr>
</table>

Source: REFLOR-CV project documents, reports and website

4. Finance, Technology and Capacity--building Needs and Support Received

Cabo Verde, being a fragile, vulnerable, archipelagic country with few financial and non-financial resources, faces several significant capacity constraints, limited fiscal space and insufficient internal financing to adequately respond to the challenges posed by climate change. This has been compounded by the economic consequences of the COVID-19 pandemic, aggravating the already high debt-to-GDP ratio. The pandemic has caused the biggest recession in Cabo Verde's modern history, affecting virtually all economic sectors, including tourism, which is of strategic importance. To respond to these challenges, the country is dependent on adequate international support, not only financially but also non-financially, namely staff training and the acquisition of technological equipment, in order to address climate change.

Over the years, Cabo Verde has received financial support and technical assistance from various international partners, including bilateral agencies, multilateral funds and agencies, UNFCCC funds, among others. As a stable country, it has earned the trust of international partners, not only in terms of governance, but also due to the success of externally funded structural projects. One example of trust in governance is the funding provided by the Luxembourg Cooperation.

4.1 Technological and financing barriers

For the world's governments to limit the rise in global temperatures to below 2°C, reduce the climate damage that is already occurring, make the transition to a low-carbon economy and seize the economic opportunities of clean energy and other climate-related activities, trillions of dollars in investments are needed over the coming decades. Current investment levels are far below what is needed. Without private sector investment, this climate investment gap will not be filled, and these goals will not be achieved.

However, the transfer, dissemination, and implementation of any new or modern technologies in Cabo Verde presupposes the existence of material, financial, human, technical-technological and legal conditions that enable the country, as a recipient, to successfully integrate such technologies and create a positive change in its economy without disturbing its socio-environmental situation.

To this end, the performance of climate governance in the country must change and be consolidated in a credible and stable way, creating the necessary regulatory environment for any type of investment and the efficiency of market instruments.

In addition, it is necessary to put forward proposals for measures aimed at removing all or part of the barriers and making the transfer of technologies and their successful dissemination possible.

Given all the limitations of existing international financing instruments, the effectiveness of climate governance will be a decisive factor in minimising these difficulties and further promoting the implementation of the NDC.

The challenges for green and climate finance, related to the country's economic, financial, and technical capacity gaps, sometimes go beyond the scope of government action, such as the regulatory environment, including clear climate action guidelines in national and sectoral plans and programmes, and incentives for the participation of different sources of funding.

Technological and financing barriers, and measures to remove these barriers and establish a favourable environment for the adoption and diffusion of technology, should be identified in a participatory way, through bilateral meetings held between stakeholders, governmental, non-governmental nature conservation, and private institutions with the potential to lead the process of diffusion of technology. Thematic groups for each development sector should emerge from these meetings to validate the measures identified in the bilateral meetings and those identified later by the stakeholders.

In bilateral meetings with the sectors, it is important to find out why the technologies identified have not yet been disseminated and why the private sector has never been interested in investing in these technologies.

According to the sectors consulted, there are two types of barriers: economic and financial, and non-financial:

- The economic and financial barriers relate to the high cost of implementing measures.

- Non-financial barriers include technical barriers, legal or regulatory barriers, institutional or organisational capacity barriers, and information and warning barriers.

Financial barriers

The financial barriers are the high costs of implementing projects for new technologies and the ability to access the funding available at international level. Even though the international climate change situation opens up many doors and opportunities for funding through international cooperation, these are sometimes difficult to access for institutions and especially for private individuals, not only because of a lack of information but also because of the procedures required, which are difficult to access.

One of the funding opportunities is within the framework of the Paris Agreement.

Non-financial barriers

Limited technical capacity - including human resources and equipment - is one of the major constraints in implementing mitigation and adaptation measures. Often, the appropriate techniques are not common knowledge, they are highly specialised, and the respective implementation requires both experts and equipment suppliers at municipal and national level, and even at international level, where a lot of lead time and advance orders are needed.

According to the World Bank, the creation of regulations that clearly define the roles of the players and provide transparency in the process of financing and implementing initiatives will determine the successful implementation of low-carbon plans and projects in the country. These projects are often in sectors whose market structures are complex and underdeveloped, given their innovative nature.

The role of the different levels of governance (central and regional/municipal) is fundamental to carry out actions that encourage increased investment and a greater participation of different financing agents, particularly the private sector, depending on the characteristics of green and climate finance. However, these actions must be planned and implemented in a joint and aligned manner. Various initiatives aimed at favouring sustainable investment have been carried out, but only occasionally. The development of sustainable projects needs to be synchronised not only with the climate goals and priorities of these areas, but also aligned with and incorporated by the various agencies and players in the national public sector.

An institutional environment favourable to investments in sustainable projects includes, first and foremost, the promotion of policies, programmes and projects aimed at combating climate change in the country (at municipal and national level). The lack of coordinated governance practices between the municipal and national levels when it comes to agreeing on low-carbon development priorities and the ways to achieve them is a major challenge for the country.

Another important issue is the low level of systematisation of information and data on sectors, projects and financial arrangements linked to low-carbon initiatives.

After identifying the barriers, measures should be drawn up to remove the barriers identified in each sector, both the financial and non-financial ones identified above.

4.2 Knowledge and Technological Needs

4.2.1 Energy

Renewable energy is the opportunity for Cabo Verde to structurally solve problems related to the energy sector, reducing energy costs and prices, minimising uncertainty and exposure to international fuel prices. Lower costs will allow the implementation of a set of active policies to reduce losses, ensuring that the cost of energy is shared by all who benefit from it, while safeguarding those with the weakest economic conditions. With constant technological innovation, there are countless new ways of producing clean, renewable energy. Some of these new ways are already being used in Cabo Verde. There should be initiatives aimed mainly at partnerships with universities and research institutions to create, for example, hybrid systems by combining two renewable energy sources, solar and wind, with a storage system, forming a *hub of* projects. Their innovative nature is because these technologies complement each other, making it possible for the various fronts involved to be connected.

Another technology already used in some countries in recent years, which could also be of great interest in Cabo Verde, is open innovation, where partnerships between companies and start-ups predominate (they bring together and map projects and partnerships), establishing agreements for solutions for solar, wind, water, energy efficiency, decarbonisation, monitoring energy consumption, among others, developed jointly. They will be able to develop new payment and customer relationship solutions in the distribution segment, transmission systems, new distributed solar generation equipment and products aimed at decarbonisation, emissions reduction, and carbon capture, among others.

Another model of open innovation is agreements between company employees and *start-up* teams. This partnership can lead to a great diversity of ideas, opinions, exchange of knowledge and experience and, ultimately, in addition to innovative solutions, the personal and professional development of those involved, who incorporate the new concepts and ways of working into their lives.

From a climate change mitigation perspective, the appropriate technologies for the country are those with zero emissions, namely technologies based on renewable energy sources such as photovoltaic systems, wind power systems, tidal and wave energy technologies:

- Increasing renewable energy storage capacity;
- Implementation of pumping stations combined with storage solutions;
- Implementation of micro-grids (construction of micro-grids based on renewable sources);
- Increase in photovoltaic solar energy with the construction of photovoltaic solar power stations;
- Modernisation and reinforcement of electricity transmission and distribution networks;
- Adoption of a roadmap for the development of smart grids;
- Mass use of smart meters;
- Public lighting with greater energy efficiency;

4.2.2 Industrial processes

To accelerate industrial development, it will be necessary to implement an ecosystem favourable to consolidating and expanding the existing production base and attracting foreign direct investment in the sector, inducing a structural change with a focus on exports, with cutting-edge technologies and highly qualified jobs, where major achievements are needed, including:

- Support for innovation and technological development to give Cabo Verde the means to keep up with new industrial methods and processes, particularly those introduced by the Industry 4.0 concept.

4.2.3 Agriculture

In the agricultural sector, the development of an appropriate information bank on new crop species and varieties, irrigation systems, cultivation systems, animal manure treatment, including biogas recovery systems, can promote and facilitate the transfer of adaptation and mitigation technologies from one country to another.

Agriculture will have to invest in more intelligent and resilient technologies, based on research and rural extension aimed at agricultural planning, with investment in education and professional training, and the creation of a favourable financial environment to promote agricultural entrepreneurship.

Cabo Verde should invest in implementing measures to prevent and mitigate the impacts of climate change, focusing on sustainability and resilience with actions aimed at:

- the mobilisation and management of water and the diversification of its sources, with a strong focus on desalination techniques for brackish and sea water, the safe reuse of treated wastewater, as well as the mobilisation of surface and underground water. Additionally, the need to increase the rational use of water through the massification of efficient irrigation systems, with an emphasis on micro-irrigation systems and the use of hydroponics, as well as the reduction of water and operating costs through the use of renewable energies and the construction of hydraulic and production support infrastructures;

- strengthening and improving the agroforestry and silvopastoral system and protecting the terrestrial ecosystem through the sustainable management of fodder resources, introducing and disseminating herbaceous, shrub and tree fodder species, using new cultivation and water-saving technologies (micro-irrigation and hydroponics), as well as promoting the collection, conservation and enhancement of fodder resources and the recovery and use of agricultural by-products;

- the promotion of controlled grazing in silvopastoral areas in accordance with carrying capacity, animal contingency and reinforcement of the fight against pests and diseases, using integrated control methods (biological control).

4.2.4 Forest

In Cabo Verde, the development of the agroforestry system is defined as one of the priority actions for the sector, through the creation and management of new areas and the intensification of existing ones.

The results of the balanced management of forage resources are expected to be the adaptation of livestock numbers (ruminants) to the forage potential of areas with a silvopastoral vocation; the existence of a participatory management plan for forage resources drawn up and implemented; and an increase in the quantity and quality of these resources in the existing and created forest perimeters. This makes it necessary to ensure:

- Knowledge of the potential and existing forage resources and animal numbers (qualitative and quantitative) of all the existing and future silvopastoral perimeters;

- Training farmers in resource management, sowing and planting forage species, collecting, conserving and marketing grassland, managing livestock, balancing animal loads and the forage potential of silvopastoral areas;

- Training and specialisation of experts in the areas of design, planning, monitoring, and drawing up participatory forestry management plans.

4.2.5 Waste

Urban waste management in Cabo Verde is a major challenge, both in terms of treatment and valorisation as a resource with economic value, and in terms of its final destination. The country has faced major barriers in designing and implementing robust waste recovery and final

treatment systems, including difficulties in accessing waste management technologies with a lower impact on GHG emissions (sorting, separation, recycling, collection and burning or energy recovery of methane).

4.3 Support needed for the MRV system

4.3.1 Nationally

- Approval and official publication of the law creating the national MRV system;
- Mobilisation of funding for the MRV system;
- Reinforcement and training of human resources on MRV issues;
- Mobilisation of all stakeholders in the national MRV system;
- Creation of mechanisms for collecting, processing, analysing and archiving data and all documentation produced within the SNMRV;
- The need for a coordinating body for the SNMRV;
- Need for other MRV projects on climate change adaptation and mitigation;
- Centre for archiving data and information on mitigation projects and INGEE;
- System for effective communication and transmission of data and information between the sectors and the coordinating body;
- Existence of a memorandum of understanding with telecoms operators to reduce transmission costs;
- Establishment of a database to archive the data collected from the sectors.

4.3.2 At sector level

- Strengthening sectoral capacities on MRV issues;
- Legal framework for the application of data provision procedures;
- Need for training in collecting, processing, analysing and archiving data of interest to the SNMRV;
- Training in IPCC guidelines, guides and software for INGEE;
- Appointment of a Focal Point for MRV issues;
- Training and capacity building for greater involvement in awareness-raising and communication on the impacts of climate change;
- Computer equipment for processing and archiving data and information collected in production processes.

4.4 Financial support received

4.4.1 Methodological note

As this is Cabo Verde's first BUR Report to be presented to the UNFCCC and because not all the information is concentrated in one place, the National Directorate for the Environment (DNA) decided to take stock of the climate funding received from international cooperation partners, covering only Cabo Verde's government institutions and some civil society organisations (non-governmental organisations) as recipients of funding, without including private companies.

The methodology used to draw up this section of the document includes a work plan, a schedule of activities and a methodological roadmap, with a view to achieving the objectives and products. Once the work plan and methodological roadmap had been approved, the UNFCCC Guidelines in the Report of the 17th Conference of the Parties were analysed. The Terms of Reference drawn up by the Project Coordinator of the Fourth National Communication and First Biennial Update (4CN&1BUR) were also followed.

The second step was to define or find a concept of climate finance that was closer to Cabo Verde's reality. After researching different bibliographic sources, the following concept was retained:

"*Climate finance is local, national or international funding*[1] *from public, private and alternative sources that aims to support actions to mitigate and adapt to climate change, in accordance with the "UN Framework Convention on Climate Change (UNFCCC)". It is intended to reduce emissions and improve GHG sinks, as well as reduce vulnerability and maintain and increase the resilience of human and ecological systems to the negative impacts of climate change, as defined by the UNFCCC's Standing Committee on Finance (SCF)*".

From there, the decision was made to collect existing information, defining the sectors in which to look for the required data. Sectors that have a strong relationship with climate change issues were chosen, namely:

- Energy
- Maritime Economy
- Water and Sanitation
- Agriculture
- Environment
- Tourism
- Transport
- Health
- Civil Protection and
- Industry.

[1] This chapter only concerns initiatives with international support.

Once the sectors had been defined, information began to be collected on the funding received by the country through the Integrated Budgetary and Financial Management System (SIGOV), which is an instrument of excellence when it comes to the financial management of the State of Cabo Verde. SIGOV's main objectives are budgetary control, expenditure management, revenue management and the management of public accounts. The information obtained from this system is reliable. However, it should be noted that SIGOV does not yet track funding received and managed directly by partners, which is considered to be a gap in the reliable tracking of funding received.

Having obtained the agreement of the Project Coordinator to use SIGOV as the main source of information, information was requested from the DGPOGs[2] of the sectors identified and some donors such as the GEF-SGP. In this first report there was no opportunity to contact other partners who could provide more information, such as UNDP, FAO or UNIDO. The Ministry of Finance was also contacted, through the National Directorate of Budget and Public Accounting (DNOCP), to provide the databases of the sectors defined as priorities. Unfortunately, almost none of the sectors responded to the request, except for DNICE (National Directorate for Industry, Trade and Energy) and Civil Protection (who indicated it had no data).

Next, the structure of the Table for the presentation of the data was defined and the Table was completed with the data obtained. The Table on financial support received (Annex E) contains the following fields :

- Receiving institution;
- Year;
- Type of support (mitigation and adaptation);
- Sector;
- Project Name;
- Funding received;
- Type of funding source (national or international);
- Identification of the donor/funding source;
- Financing modality (loan, grant, and food aid).

Based on information from SIGOV (in the case of the MAA, this was available from the MAA), DNICE and the GEF-SGP, the projects that have contributed to minimising the negative effects of climate change were identified. In the case of the projects listed by the MAA, to confirm whether they were climate-funded projects, the existing planning tools in the sector were used, such as the project sheets and logical frameworks, to confirm their relationship with climate change. Once this was established, the projects that have contributed to Mitigation or Adaptation were identified. The data provided by DNICE and SGP-GEF already indicated that they referred to climate change projects and indicated whether they were

[2] DGPOG - its mission is to formulate and monitor sectoral public policies and provide technical and administrative support in budget, human resources, financial and property management.

Mitigation or Adaptation projects. To define whether a project was an Adaptation or Mitigation project, Cabo Verde's NDC Report was used to confirm whether the projects had Mitigation or Adaptation activities. The OECD Marker System document[3] , which sets out the definition and eligibility criteria for the Rio Markers (specifically the UNFCCC-related markers), was also consulted.

The definitions contained in the Rio Marker System were chosen, and in the case of Mitigation, the following definition was retained:

> *An activity should be classified as geared towards climate change mitigation (scoring as Major or Significant) if: it contributes to stabilising greenhouse gas (GHG) concentrations in the atmosphere to the point of preventing dangerous anthropogenic interference in the climate system through efforts to reduce/limit GHG emissions or increase GHG sequestration.*

In the case of Adaptation, the following definition has been retained:

> *An activity should be classified as orientated towards adaptation to climate change (scoring as Major or Significant) if: it aims to reduce the vulnerability of human or natural systems to the impacts of climate change and climate-related risks by maintaining or increasing adaptive and recovery capacity.*

An initial assessment of the data collected revealed that:

- 100 projects were funded;
- This funding was allocated to 7 (seven) recipient organisations, namely: the National Directorate of Industry Trade and Energy (DNICE), the MAA (which includes the General Directorate of Agriculture Forestry and Livestock -DGASP and the National Secretariat for Food Security and Nutrition - SNSAN, OPOSER), the National Water and Sanitation Agency (ANAS), the National Directorate of Environment (DNA), the National Institute of Meteorology and Geophysics (INMG), ELECTRA and Civil Society;
- Eighteen benefiting sectors were also identified;
- The sectors that received the most funding were Energy, Agriculture, Transport and Water Resources.

22 donors/funding sources were identified.

4.4.2 Multilateral and bilateral financial support received

According to the definition presented above, Cabo Verde uses different sources of international and national funding to address its development in general and, specifically, to address the harmful effects of climate change. For the purposes of this report, only international funding received through bilateral or multilateral co-operation was considered.

[3] Marker Systems, Lisbon, Ministry of Foreign Affairs, 2015

Several project funding mechanisms were identified that have made resources available to implement various actions in the areas of climate change mitigation and adaptation, listed in Table 14 below:

Table 14. Financing Mechanisms

CATEGORY	MECHANISM
NATIONAL FUNDING	
	TREASURY /FNA (Consigned Income)
INTERNATIONAL FUNDING	
BILATERAL AGENCIES	Spain, Portugal, Luxembourg, Japan, Germany, Canada, and the European Union
MULTILATERAL FUNDS AND AGENCIES	WB, BAD, ECREE (ECOWAS)
UNFCCC FUNDS	Global Environment Facility, SGP
	Green Climate Fund
Non-UNFCCC financial mechanisms	UNDP, FAO, FIDA

Source: Own elaboration

The Table 14 shows the different financial mechanisms arising from bilateral or multilateral agreements between the Government of Cabo Verde and Partner Entities or Governments, in the form of food aid, donations or grants and loans, as part of bilateral or multilateral cooperation.

The financing amounts were provided in foreign currency (dollars and euros) and in national currency. To standardise the figures, it was decided to present them in US dollars as the reference currency, using the exchange rates provided by the Central Bank of Cabo Verde (BCV).

Analysing Figure 11 below, Cabo Verde received a total of USD 49,882,507 **(forty-nine million, eight hundred and eighty-two thousand, five hundred and seven US dollars)** between **2016 and 2022**. As shown in Figure 9, 2021 is the year in which the most funds were received and 2018 the least, 19,646,165 million US dollars and 1,672,441 million US dollars respectively.

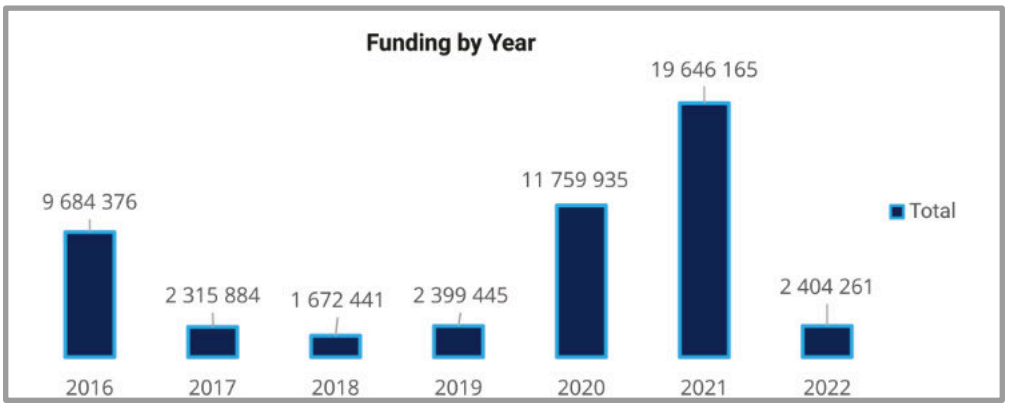


Figure 11 – Financial support received

Of the total amount received, as illustrated in Figure 10, during the period under analysis, 80% was earmarked for mitigation projects and 20% for adaptation projects, with USD 39,955,687 (thirty-nine million, nine hundred and fifty-five thousand, six hundred and eighty-seven US dollars) channelled to mitigation and USD 9,926,820 (nine million, nine hundred and twenty-six thousand, eight hundred and twenty dollars) to adaptation.

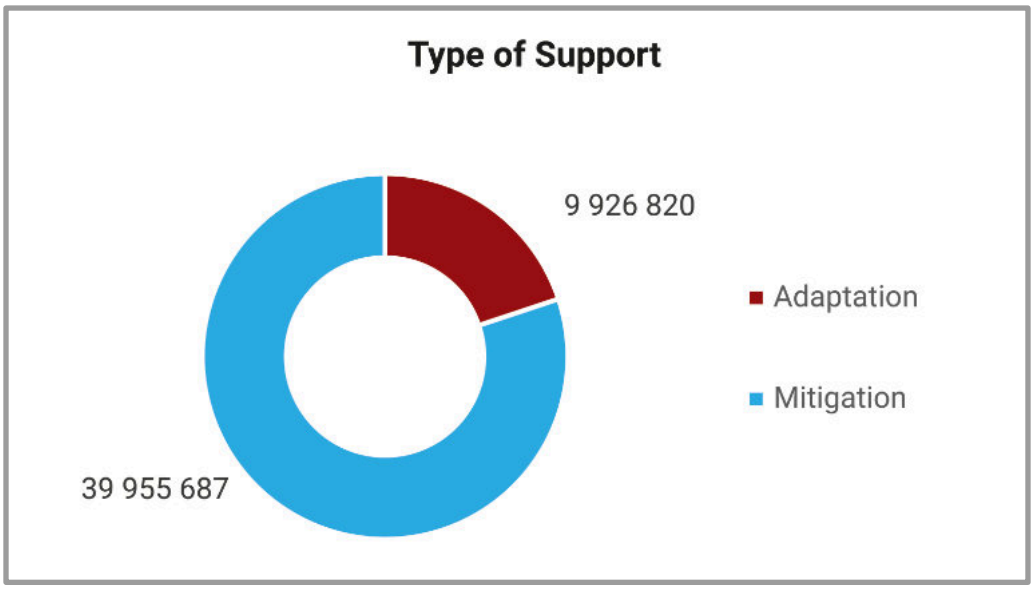


Figure 12 - Funding Received for Adaptation and Mitigation

The sectors that received the most climate finance were energy, transport, agriculture, and water resources. These sectors received between USD 3,284,145 (three million, two hundred and eighty-four thousand, one hundred and forty-five US dollars) and USD 30,096,937 (thirty million, ninety-six thousand, nine hundred and thirty-seven US dollars). See Figure below:

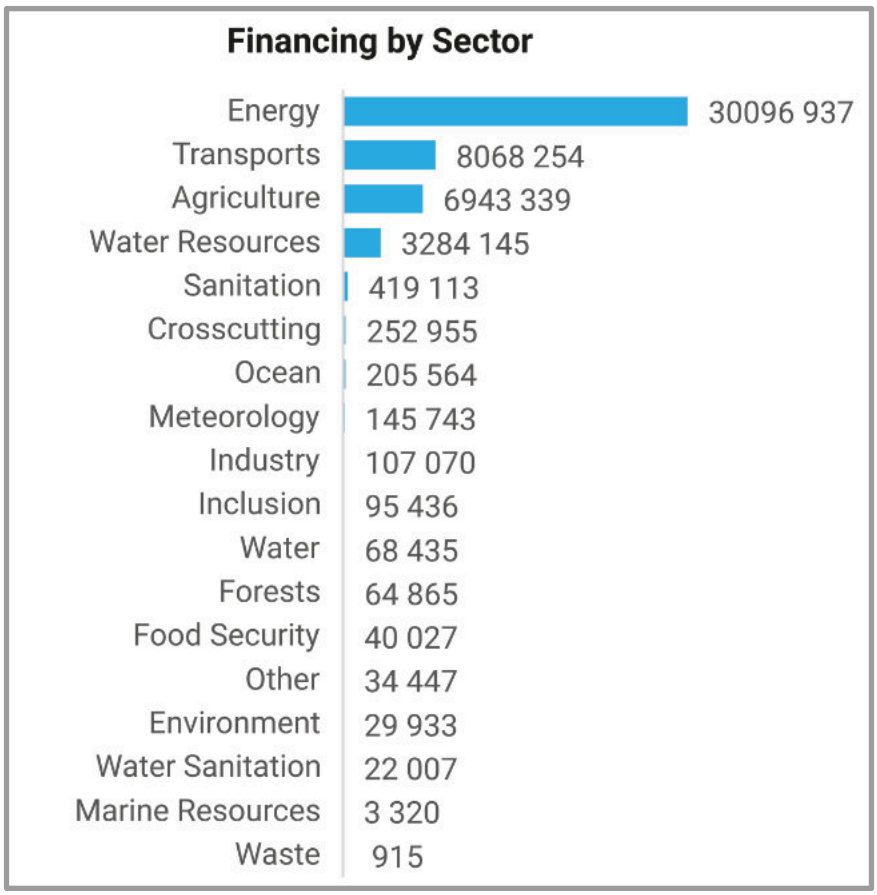


Figure 13 - Financing by Sector

Figure 14 shows that approximately 23 donors/funding sources were accounted for, including bilateral cooperation donors/funding sources (Spain, Luxembourg, the European Union, etc.), Multilateral Funds and Agencies (WB - World Bank, ADB), UNFCCC Funds and non-UNFCCC financial mechanisms such as UNDP and FAO. Among the donors/funding sources, the largest is the NAMA Facility, followed by the CCEFCF (Canada World Bank for Clean Energy and Forest Climate Facility), Luxembourg Cooperation, the GEF (Global Environment Facility), the IDA (International Development Assistance) and the IRBD (International Bank for Reconstruction and Development).

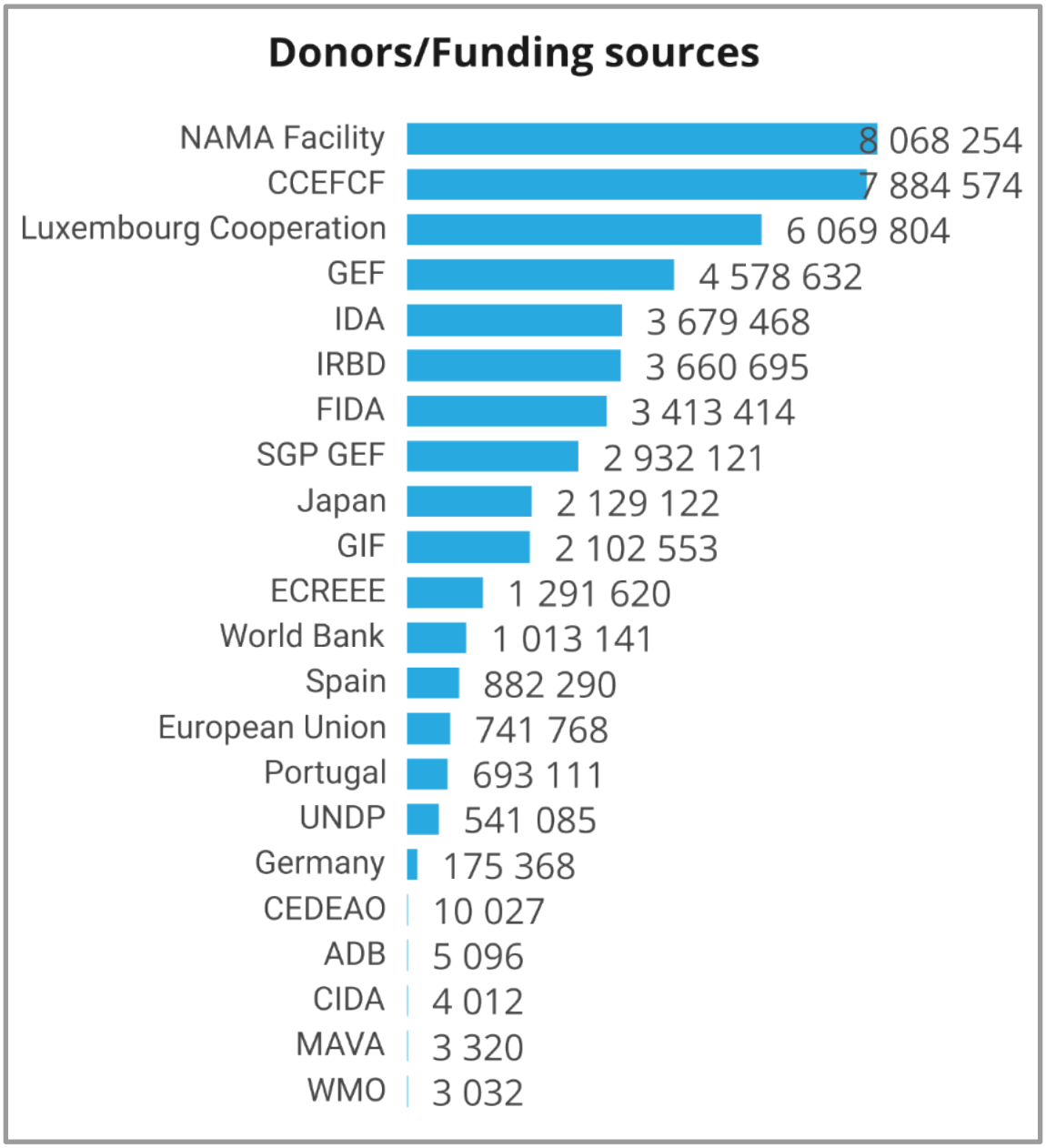


Figure 14 – Donors/Funding sources by amounts allocated.

As illustrated in Figure 15, multilateral organisations are the largest funders, accounting for 60% of the overall total, or USD 29,929,504 (twenty-nine million, nine hundred and twenty-nine thousand, five hundred and four US dollars).

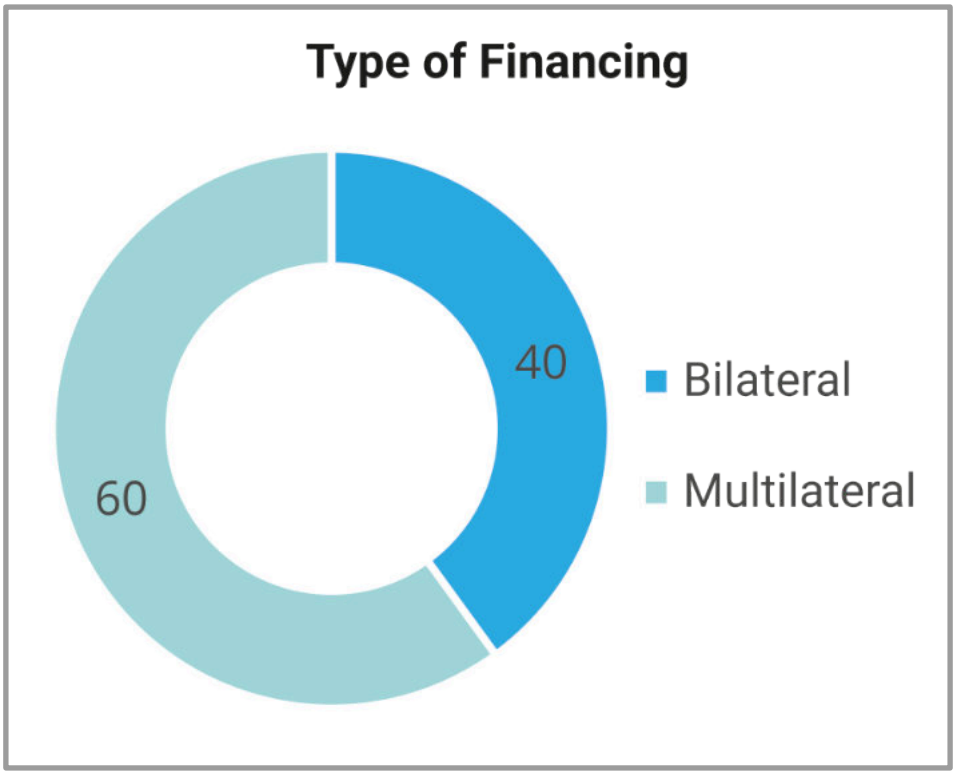


Figure 15 - Bilateral and Multilateral Financing

4.5 Technological and capacity-building support received

Cabo Verde recognises that the projects listed in the table of financial support received include, for the most part, aspects of capacity-building support and, perhaps to a lesser extent, technological support, and support for technology transfer. Many of these projects, as illustrated below, have technical and technological support components. As it is impossible to describe all the capacity-building or technological support actions received by Cabo Verde during the period covered by this report, it was decided to include only a few illustrative examples of this support received in terms of both capacity-building and technology.

In the next report, Cabo Verde will endeavour to clearly identify the projects with significant capacity-building or technological support aspects, to be able to provide a more representative description of the best success stories.

Example of technical support (capacity-building): Training of Trainers in Bioenergy

The AGoSE-AO project (Improving the Governance of the Energy Sector in West Africa) aims to contribute to improving the regional governance of the energy sector in West Africa through activities at regional and national level. It provides technical assistance to initiatives aimed at improving access to modern energy and promoting RE and EE to a variety of public and private actors in the 15 ECOWAS countries and Mauritania. It is funded by the European Union, and CERMI (Centre for Renewable Energies) is implementing a project to "Strengthen CERMI's Regional Anchoring in ECOWAS", with the support of Luxembourg Cooperation

Example of technical and technological support 1: Promoting Electric Mobility in Cabo Verde

The **Promotion of Electric Mobility in Cabo Verde Project (ProMEC)** is promoted by the Government of Cabo Verde and implemented by the German Agency for International Cooperation (GIZ) in collaboration with the Ministry of Industry, Trade and Energy, with funding from the Mitigation Action Facility. The aim of the project is to promote electric vehicles (EVs) in order to achieve a significant share of EVs in Cabo Verde's vehicle fleet.

The project has 8 components:

1. Incentive programme to support the purchase of 600 electric vehicles and 100 WallBox-type charging stations;

2. Establishment of a public charging network with at least 40 charging stations;

3. Developing the legal and regulatory framework for EVs, charging stations and EV charging station operators;

4. Implementation of pilot projects through the supply of electric buses for:

- Urban passenger transport in the cities of Praia and Mindelo, with 2 electric buses each;
- School transport, with a maximum of 3 buses;

5. Training for professionals in the sector, including international knowledge exchange;

6. Monitoring and reporting of GHG emissions related to road transport;

7. Raising awareness of the population in general;

8. Integration of electric vehicle charging into the electricity grid.

Example of technical and technological support 2: Promotion of Solar Thermal Energy for Water Heating

With the support of the Spanish Cooperation, the government of Cabo Verde, through the National Directorate of Energy, Industry and Commerce and the Centre for Renewable Energies and Industrial Maintenance, is implementing a project that will support the creation of a solar thermal energy market in Cabo Verde as well as the development of endogenous capacity, guaranteeing security and confidence in the market.

Components 3 and 4 of the project are the ones that most clearly provide training and technological support, although the whole project is very much of this nature.

Around 15 technicians were trained on the island of Sal, filling the gap in specialised labour in this area. As part of the practical training, demonstration projects were installed with the direct involvement of the trainees/technicians throughout the process. The following hotels were chosen for the installation of demonstration projects:

- Hotel Relax: installation of a 500-litre forced system;
- Central hotel: installation of a 500-litre forced system;

- Santos residence: installation of a 200-litre forced system;
- Hotel Pontão: installation of a forced-air heating system for the 500 to 1000 litre jacuzzi;
- IEFP-Sal: installation of a thermosiphon kit that will be used for practical lessons in future training courses on the island of Sal.

In the context of component 4, various events and workshops were held to socialise the project and raise awareness among players in the sector of the need to adopt solar thermal technology instead of conventional systems for heating water in buildings and producing heat in industrial sectors.

8. Integration of electric vehicle charging into the electricity grid.

Example of technological support 2:
REFLOR CV - new technologies for reforestation

The REFLOR-CV project of the Ministry of Agriculture and Environment, funded by the European Union and the FAO, supports the initiative to use new technologies to combat desertification and promote reforestation. Thanks to a partnership with UNDP-Cabo Verde, through the Accelerator LAB, seed balls (seeds encased in clay) were launched using a drone in two locations in Santiago where the forestry project is located: Serra Malagueta and Achada Leite.

The action had a strong technical involvement of the FAO and MAA team through the REFLOR-CV project, from the selection of seeds to the production of seed balls by local communities, including the mapping of the locations covered by the innovative initiative.

The use of seed balls is a technique that consists of throwing selected seeds encapsulated in clay onto a defined site, whose function is to protect and provide a suitable environment for their germination, especially in places suffering from water scarcity and desertification.

© https://reflor.maa.gov.cv/events/projeto-reflor-cv-e-pnud-utilizam-novas-tecnologias-para-reflorestacao-77

4.6 Gaps and needs in information about support received

Due to the social, economic, and environmental situation, the information presented in this document should be considered provisional and partial, because it was not possible to list all the projects in the sectors identified and all the sources of funding, which also prevented a greater and better reflection on the funding received and, from there, a better analysis of the support received. The constraints encountered during the preparation of this section of Cabo Verde's First BUR Report make it possible to list the main gaps in data/information on climate support received by Cabo Verde:

- Non-availability of data by the sectors: of the 8 sectors listed to provide data on climate finance, only one sector did (Energy);

- There is still no coordinator (from the environment sector) to collect and compile information on the financial resources available to implement climate-related projects;

- Lack of knowledge on the part of the sectors about what Climate Financing is, which may possibly have contributed to the data not being made available;

- Although the SIGOV system is very reliable for providing data on funding received, SIGOV currently does not have and/or cannot track projects that are funded and managed directly by cooperation agencies such as UNDP, FAO, etc. and whose sources of funding are bilateral (USAID, Japan) or multilateral partners such as GEF, UNDP, the European Union[4] .

- Some lack of sensitivity on the part of Cabo Verde's finance sector, which coordinates SIGOV, has all this information and could have made the entire database of these sectors available for the necessary analysis;

- It was not possible to identify what percentage of a given project's funding was climate-specific. Except perhaps for the POSER - CLIMA project, which has a specific component for this type of activity.

- It was not possible to analyse all the available resources and identify the funding gap.

- The classification of support for mitigation and adaptation of the projects included in SIGOV may be somewhat imprecise currently, so it will be necessary to improve this aspect.

There is a need to improve the capacity to communicate information to better identify the amounts and destination of these flows, in order to better evaluate their results, with a view to identifying challenges and opportunities to optimise their use.

The collection and compilation of information on financial resources received and available to implement activities, measures and programmes related to climate change should be mandatory.

The various sectors and the Ministry of Finance's awareness needs to be raised on the importance of making this information available in a timely manner.

[4] An example of this is the Project to Strengthen the Adaptation and Resilience Capacity of the Forestry Sector in Cabo Verde (REFLOR-CV), financed with funds from the European Union, through the FAO, the agency that directly managed the funds made available. This project received a grant of 4,744,623 Euros over a period of approximately 5 years. There is also the case of the CCPD (UNDP Framework for the period 2017-2022, in which there are approximately 14 projects in various areas (civil protection, energy, waste, etc.) with funding totalling 12,533,172 US dollars).

To this end, a legal mechanism should be created to make it mandatory to provide the data available in the SIGOV to the institution responsible for drawing up and presenting Cabo Verde's BUR (the DNA), since the reporting to the UNFCCC must be presented every two years from 2024 onwards.

Use the project sheets and logical frameworks used in the National Planning System, which must be submitted to the DNOCP, and include a section where it is mandatory to indicate the percentage of the project that corresponds exclusively to climate finance.

As is currently the case with the Gender Marker, the MAA's project template has been altered so that it can be Gender Marked. In the case of climate funding, the same should be done. This work would be closely linked to the use of Climate Markers, which DNA intends to implement.

As this is the first time that Cabo Verde has drawn up its Biennial Update Report (BUR), the DNA must ensure and create the necessary conditions and mechanisms to guarantee that all partners collaborate in obtaining the information required:

- Overcoming institutional challenges related to the collection, use, compilation and storage of data related to climate change financing;
- Ensure the collection and compilation of information on climate finance resources in a systematic, timely and mandatory manner;
- Ensure with international and national partners that financial availability is adequate, predictable, inclusive and sustainable;
- Improve communication of the results of climate-financed projects;
- Improve communication on this specific issue and the issue of climate change in general, in order to improve the knowledge and understanding of these issues by all stakeholders;
- Promote the involvement of the private sector to determine the number of projects financed by this sector, the resources mobilised and the participation of the private sector in international events on climate finance.

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BUR
Annexes

ANNEX A - Table explaining the categories of GHG emission sources considered as NE by type of gas and sector.

Categories considered as Not Estimated (NE)			
Gases	**Sector**	**Category**	**Explanation**
CO_2	Energy	1B3. Other Emissions from Energy Production	Fugitive emissions occur in the country, essentially in the processing, distribution, and end use of fossil fuels. These emissions have not been estimated in this inventory as there is no available data and/or measurements carried out in the country.
	Industrial Processes and Other Uses	2A2. Lime production	Emissions from the production of lime were not estimated, as there is no data available and production is considered to be very small, with few products.
	Agriculture, and Forestry and other land uses (LULUCF)	3D1. Harvested wood products	Emissions associated with the collection of wood products were not estimated because there was no data available to estimate them.
CH_4	Energy	1B3. Other Emissions from Energy Production	Fugitive emissions occur in the country, essentially in the processing, distribution, and end use of fossil fuels. These emissions have not been estimated in this inventory as there is no available data and/or measurements carried out in the country.
	Industrial Processes and Other Uses	2A2. Lime production	Emissions from the production of lime were not estimated as there is no data available and production is very small, with few products.
	Agriculture, and Forestry and other land uses (LULUCF)	3C1. Burning agricultural waste	Emissions related to the burning of agricultural waste were not estimated in this inventory because data on the areas burnt due to the burning of agricultural waste, a practice used in the country to prepare the soil for agriculture, was not available.
	Agriculture, and Forestry and other land uses (LULUCF)	3D1. Harvested wood products	Emissions associated with the collection of wood products were not estimated because there was no data available to estimate them.
N_2O	Energy	1B3. Other Emissions from Energy Production	Fugitive emissions occur in the country, essentially in the processing, distribution, and end use of fossil fuels. These emissions have not been estimated in this inventory as there is no available data and/or measurements carried out in the country.
	Agriculture, and Forestry and other land uses (LULUCF)	3C1. Burning agricultural waste	Emissions related to the burning of agricultural waste were not estimated in this inventory because data on the areas burnt due to the burning of agricultural waste, a practice used in the country to prepare the soil for agriculture, was not available.
	Agriculture, and Forestry and other land uses (LULUCF)	3D1. Harvested wood products	Emissions associated with the collection of wood products were not estimated because there was no data available to estimate them.

ANNEX B - Sectoral tables of GHG emissions and removals in 2019.

ANNEX B1 - GHG emissions in 2019 in the Energy sector broken down by subsector

Categories of greenhouse gas sources	CO_2	CH_4	N_2O
	Gg		
1. Energy	**650,9141**	**0,2672**	**0,0178**
1A. Fuel combustion activities	650,9141	0,2672	0,0178
1A1. Energy production industries	285,4341	0,0112	0,0022
1A2. Manufacturing and construction	30,7865	0,0081	0,0012
1A.2.k - Construction	14,6179	0,0006	0,0001
1.A.2.m - Unspecified industry	16,1685	0,0075	0,0010
1A3. Transport	262,1149	0,0255	0,0112
1A3.a - Air	70,7200	0,0005	0,0020
1A.3.b. - Land	167,8750	0,0230	0,0086
1A.3.c - Maritime	19,4928	0,0018	0,0005
1.A.3.e - Others	4,0271	0,0002	0,0000
1A4. Other Sectors	62,4790	0,2211	0,0031
1.A.4.a Commercial/Institutional	12,5409	0,0042	0,0001
1A4.b. Residential	37,2877	0,2151	0,0029
1A4.c. Agriculture/Forestry/Fishing	12,6505	0,0017	0,0001
1A5. Unspecified	10,0997	0,0014	0,0001
1B. Fugitive emissions	NE	NE	NE
Memo items			
International bunkers	878,9307	0,0545	0,0236
1.A.3.a.i - International aviation	310,5604	0,0022	0,0087
1.A.3.d.i - International maritime transport	568,3703	0,0523	0,0149
1.A.5.c - Multilateral operations	NE	NE	NE
CO_2 emissions from Biomass	96,7277		
CO_2 emissions from using manure as energy	21,9896		

Annex B2- GHG emissions in 2019 in the Industrial Processes and Other Uses sector broken down by subsector

Categories of greenhouse gas sources	CO_2	CH_4	N_2O	HFC	Other fluorinated products
	Gg			CO_{2eq}	
2. Industrial Processes and Other Uses	**1,014**			**25,095**	**NO**
2A. Mineral Industry	NO				
2A1. Cement production	NO	NO			
2A2. Lime production	NE	NE			
2A3. Glass production	NO	NO			
2A4. Other uses of carbonates in the process	NO	NO			
2A5. Others	NO	NO			
2B. Chemical Industry	NO	NO	NO	NO	NO
2B1. Ammonia production	NO	NO	NO		
2B2. Nitric acid production			NO		
2B3. Adipic acid production	NO		NO		
2B4. Production of caprolactam, glyoxal and glyoxylic acid	NO		NO	HFC	HFC
2B5. Carbide production	NO	NO			
2B6. Titanium dioxide production	NO				
2B7. Soda ash production	NO				
2B8. Petrochemicals and carbon black production	NO	NO			
2B9. Fluorochemical production				NO	NO
2B10. Others	NO	NO	NO		
2C. Metal Industry					
2C1. Iron and steel production	NO	NO			
2C2. Production of iron alloys	NO	NO			
2C3. Aluminium production	NO			NO	
2C4. Magnesium production	NO				
2C5. Lead production	NO				
2C6. Zinc production	NO				
2C7. Others	NO	NO	NO	NO	NO
2D. Non-Energetic Fuel Products and Solvent Use	1,014				
2D1. Use of lubricants	0,900				
2D2. Use of paraffin wax	0,113				
2D3. Use of solvents					
2D4. Others					
2E. Electronics Industry					
2E1. Integrated circuit or semiconductor				NO	NO
2E2. Flat screen TFT				NO	NO
2E3. Photovoltaics				NO	NO
2E4. Thermal fluid				NO	NO
2E5. Others				NO	NO
2F. Use of products as substitutes for substances that degrade the ozone layer				25,095	
2F1. Refrigeration and air conditioning				25,095	NO
2F2. Blowing agents					NO
2F3. Fire protection					NO
2F4. Aerosols					NO
2F5. Solvents					NO
2F6. Other applications					NO
2G. Manufacture and use of other products				NO	NO
2G1. Electrical equipment				NO	NO
2G2. SF6 and PFCs from other product uses					NO
2G3. N_2O of product use			NO		
2G4. Others	NO	NO	NO	NO	NO
2H. Others	NO	NO	NO		
2H1. Pulp and paper industry	NO	NO	NO		
2H2. Food and beverage industry	NO	NO	NO		
2H3. Others	NO	NO	NO		

Annex B3 - GHG emissions in 2019 in the AFOLU sector broken down by subsector

Categories of greenhouse gas sources	CO_2 Emissions/ removals	CH_4	N_2O
	Gg		
3. Agriculture, LULUCF	**-56,937**	**2,442**	**0,188**
3A. Livestock		2,442	0,032
3A1. Enteric fermentation		2,268	
3A2. Waste management		0,174	0,032
3B. Forest and Other Land Uses (LULUCF)	-58,98	NO	NO
3B1. Forest	-114,76	NO	NO
3B2. Agriculture	NA		
3B3. Grassland	32,22		
3B4. Flooded Area	NA		
3B5. Urban Area	4,51		
3B6. Other land uses	19,05		
3C. Aggregate Sources and Sources of Non-CO_2 Emissions in the soil	2,041		0,156
3C1. Burning agricultural waste		NE	NE
3C2. Liming	NO	NO	NO
3C3. Application of urea	2,041		
3C4. Direct emissions of N_2O from managed soils			0,1163
3C5. Indirect emissions of N_2O from managed soils			0,0003
3C6. Indirect emissions of N_2O from manure management			0,0395
3C7. Rice cultivation		NO	
3C8. Other (please specify)		NO	NO
3D. Others	NE	NE	NE
3D1. Harvested wood products	NE	NE	NE
3D2. Others	NO	NO	NO

Annex B4 - GHG emissions in 2019 in the waste sector broken down by subsector

Categories of greenhouse gas sources	CO_2	CH_4	N_2O
	Gg		
4. Waste	**72,408**	**4,245**	**0,027**
4A. Disposal of solid waste		0,830	
4B. Biological treatment of solid waste		NO	NO
4C. Incineration and open air burning of waste	72,408	0,497	0,011
4C.1. Incineration	0,043		
4C.2 Open air burning of waste	72,365	0,497	0,011
4D. Wastewater treatment and discharge		2,917	0,015
4D.1 Domestic effluents		2,777	0,015
4D.2 Industrial effluents		0,140	NE
4E. Others		NO	NO

ANNEX C - Calculation of the Uncertainties of the National GHG Inventory in 2019.

A	B	C	D	E	F
					$\frac{C^2 \times (D^2 + E^2)}{(\Sigma C)^2}$
Category of GHG emission and removal sources	Gas	Emissions CO_{2eq}	Uncer-tainties activity data	Uncer-tainties emission factors	Contribution to variance
1.A.1.a. Energy production industry	CO_2	285,43	3%	7%	0,00056993596
1.A.1.a. Energy production industry	CH_4	0,23	3%	70%	0,00000003257
1.A.1.a. Energy production industry	N_2O	0,69	3%	70%	0,00000028392
1.A.2.k - Construction	CO_2	14,62	5%	7%	0,00000190718
1.A.2.k - Construction	CH_4	0,01	5%	70%	0,00000000009
1.A.2.k - Construction	N_2O	0,04	5%	70%	0,00000000080
1.A.2.m - Unspecified industry	CO_2	16,17	5%	7%	0,00000233323
1.A.2.m - Unspecified industry	CH_4	0,16	5%	70%	0,00000001489
1.A.2.m - Unspecified industry	N_2O	0,32	5%	70%	0,00000006251
1.A.3.a. Air transport	CO_2	70,72	5%	5%	0,00003016064
1.A.3.a. Air transport	CH_4	0,01	5%	100%	0,00000000013
1.A.3.a. Air transport	N_2O	0,61	5%	150%	0,00000102166
1.A.3.b. Land transport	CO_2	167,88	5%	4%	0,00013936140
1.A.3.b. Land transport	CH_4	0,48	5%	70%	0,00000013874
1.A.3.b. Land transport	N_2O	2,67	5%	100%	0,00000863281
1.A.3.d. Maritime transport	CO_2	19,49	5%	3%	0,00000155817
1.A.3.d. Maritime transport	CH_4	0,04	5%	50%	0,00000000046
1.A.3.d. Maritime transport	N_2O	0,16	5%	100%	0,00000003216
1.A.3.e. Other transport	CO_2	4,03	5%	7%	0,00000014475
1.A.3.e. Other transport	CH_4	0,00	5%	70%	0,00000000001
1.A.3.e. Other transport	N_2O	0,01	5%	70%	0,00000000006
1.A.4.a. Commercial/institutional	CO_2	12,54	15%	7%	0,00000519747
1.A.4.a. Commercial/institutional	CH_4	0,09	15%	70%	0,00000000488
1.A.4.a. Commercial/institutional	N_2O	0,03	15%	70%	0,00000000050
1.A.4.b. Residential	CO_2	37,29	15%	7%	0,00004594821
1.A.4.b. Residential	CH_4	4,52	15%	70%	0,00001261650
1.A.4.b. Residential	N_2O	0,91	15%	70%	0,00000050827
1.A.4.c. Agriculture/forestry/fishing	CO_2	12,65	15%	7%	0,00000528872
1.A.4.c. Agriculture/forestry/fishing	CH_4	0,04	15%	70%	0,00000000079
1.A.4.c. Agriculture/forestry/fishing	N_2O	0,03	15%	70%	0,00000000062
1.A.5 Other	CO_2	10,10	15%	7%	0,00000337094
1.A.5 Other	CH_4	0,03	15%	70%	0,00000000051
1.A.5 Other	N_2O	0,03	15%	70%	0,00000000040
2.D.1 Use of lubricants	CO_2	0,90	20%	54%	0,00000032422
2.D.2 Paraffins	CO_2	0,11	20%	102%	0,00000001668
2.F.1 Refrigeration and air conditioning	HFCs	25,09	10%	30%	0,00007595442
3.A. Enteric fermentation	CH_4	47,62	20%	30%	0,00035562213
3.B. Waste management	CH_4	3,66	20%	30%	0,00000209723
3.B. Waste management	N_2O	9,81	20%	30%	0,00001507452
3B1.1 Forest remains forest	CO_2	-111,09	30%	30%	0,00267912410
3B1.2 Land converted to forest	CO_2	-3,67	30%	30%	0,00000292210
3B3. Land converted to Grassland	CO_2	32,22	30%	30%	0,00022539094
3B5. Land converted into an Urban Area	CO_2	4,51	30%	30%	0,00000441007
3B6. Land converted to Other Uses	CO_2	19,05	30%	30%	0,00007879712
3C3. Application of Urea	CO_2	2,04	10%	5%	0,00000006279
3.C4. Direct N_2O emissions from managed soils	N_2O	36,06	15%	80%	0,00103881728
3.C5. Indirect N_2O emissions from managed soils	N_2O	12,32	20%	100%	0,00019038155
4A. Disposal of solid waste	CH_4	17,43	30%	50%	0,00012463575
4C.1 Incineration	CO_2	0,04	30%	10%	0,00000000022
4C.2 Open air burning of waste	CO_2	72,36	30%	10%	0,00063160215
4C.2 Open air burning of waste	CH_4	10,44	30%	50%	0,00004467358
4C.2 Open air burning of waste	N_2O	3,56	30%	50%	0,00000518431
4.D.1 Domestic effluent	CH_4	58,32	25%	40%	0,00091289616
4.D.1 Domestic effluent	N_2O	4,79	25%	50%	0,00000865491
4D.2 Domestic Effluent	CH_4	2,94	25%	81%	0,00000749013
Total		910,56			0,0072327
				Uncertainty = $\sqrt{\Sigma F}$	8,5%

ANNEX D - Tables with the results of the key category analysis using the base year level assessment.

Emission source categories	Gases	Emissions CO_{2eq} 2019	Cumulative	Percentage
1A1. Energy production industries	CO_2	285,4341	285,4341	25,04%
1A.3.b. - Land transport	CO_2	167,8750	453,3091	39,76%
3B1. Forest	CO_2	114,7567	568,0658	49,83%
4C.2 Open air burning of waste	CO_2	72,3650	640,4308	56,17%
1A3.a - Air transport	CO_2	70,7200	711,1507	62,38%
4D.1 Domestic effluent	CH_4	58,3247	769,4754	67,49%
3A1. Enteric fermentation	CH_4	47,6244	817,0998	71,67%
1A4.b. Residential	CO_2	37,2877	854,3875	74,94%
3C4. Direct emissions of N_2O from managed soils	N_2O	36,0565	890,4440	78,10%
3B3. Grassland	CO_2	32,2210	922,6650	80,93%
2F1. Refrigeration and air conditioning	HFC	25,0948	947,7597	83,13%
1A.3.c - Maritime Transport	CO_2	19,4928	967,2526	84,84%
3B6. Other uses	CO_2	19,0513	986,3039	86,51%
4A. Disposal of solid waste	CH_4	17,4337	1003,7376	88,04%
1.A.2.m - Unspecified industry	CO_2	16,1685	1019,9061	89,46%
1A.2.k - Construction	CO_2	14,6179	1034,5240	90,74%
1A4.c. Agriculture/Forestry/Fishing	CO_2	12,6505	1047,1745	91,85%
1.A.4.a Commercial/Institutional	CO_2	12,5409	1059,7154	92,95%
3C6. Indirect emissions of N_2O from manure management	N_2O	12,2419	1071,9573	94,03%
4C.2 Open air burning of waste	CH_4	10,4374	1082,3947	94,94%
1A5. Not specified	CO_2	10,0997	1092,4943	95,83%
3A2. Waste management	N_2O	9,8052	1102,2995	96,69%
4D.1 Domestic Effluent	N_2O	4,7920	1107,0915	97,11%
1A4.b. Residential	CH_4	4,5178	1111,6093	97,50%
3B5. Urban Area	CO_2	4,5071	1116,1164	97,90%
1.A.3.e - Others	CO_2	4,0271	1120,1435	98,25%
3A2. Waste management	CH_4	3,6573	1123,8008	98,57%
4C.2 Open air burning of waste	N_2O	3,5556	1127,3564	98,88%
4D.2 Industrial effluents	CH_4	2,9397	1130,2961	99,14%
1A.3.b. - Land transport	N_2O	2,6720	1132,9681	99,38%
3C3. Application of urea	CO_2	2,0408	1135,0089	99,56%
1A4.b. Residential	N_2O	0,9068	1135,9157	99,64%
2D1. Use of lubricants	CO_2	0,9004	1136,8161	99,71%
1A1. Energy production industries	N_2O	0,6925	1137,5086	99,78%
1A3.a - Air transport	N_2O	0,6132	1138,1218	99,83%
1A.3.b. - Land transport	CH_4	0,4833	1138,6051	99,87%
1.A.2.m - Unspecified industry	N_2O	0,3244	1138,9295	99,90%
1A1. Energy production industries	CH_4	0,2345	1139,1640	99,92%
1A.3.c - Maritime Transport	N_2O	0,1631	1139,3271	99,93%
1.A.2.m - Unspecified industry	CH_4	0,1583	1139,4855	99,95%
2D2. Use of paraffin wax	CO_2	0,1132	1139,5986	99,96%
1.A.4.a Commercial/Institutional	CH_4	0,0888	1139,6875	99,97%
3C5. Indirect emissions of N_2O from managed soils	N_2O	0,0779	1139,7653	99,97%
4C.1. Incineration	CO_2	0,0426	1139,8079	99,98%
1A.3.c - Maritime Transport	CH_4	0,0387	1139,8466	99,98%
1A.2.k - Construction	N_2O	0,0366	1139,8832	99,98%
1A4.c. Agriculture/Forestry/Fishing	CH_4	0,0359	1139,9191	99,99%
1A4.c. Agriculture/Forestry/Fishing	N_2O	0,0317	1139,9508	99,99%
1A5. Unspecified	CH_4	0,0286	1139,9794	99,99%
1.A.4.a Commercial/Institutional	N_2O	0,0286	1140,0080	99,99%
1A5. Not specified	N_2O	0,0254	1140,0334	100,00%
1A.2.k - Construction	CH_4	0,0124	1140,0458	100,00%
1A3.a - Air transport	CH_4	0,0104	1140,0562	100,00%
1.A.3.e - Others	N_2O	0,0100	1140,0662	100,00%
1.A.3.e - Others	CH_4	0,0034	1140,0696	100,00%
Total		1140,0696		

ANNEX D - Tables with the results of the key category analysis using the base year level assessment.

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2016	Mitigation	Energy	Solar energy distribution development project	$1 013 141	World Bank	Multilateral	Loan
2016	Mitigation	Energy	Energy Efficiency in Equipment and Buildings Project (PEEE)	$1 943 609	GEF	Multilateral	Grant
2016	Mitigation	Energy	Energy Efficiency in Equipment and Buildings Project (PEEE)	$197 562	UNDP	Multilateral	Loan
2016	Mitigation	Energy	Renewable Energy Support Project (PASER)	$4 977 355	Coop. Luxembourg	Bilateral	Grant
2016	Mitigation	Energy	Elaboration of Cabo Verde's Electricity Sector Master Plan		European Union	Multilateral	Technical assistance
2016	Mitigation	Energy	Project to increase wind power capacity to offset electricity consumption in the desalination on the island of São Vicente	$1 075 109	ECREEE	Multilateral	Grant
2016	Adaptation	Agriculture	Strengthening the Water Sector's Capacity for Adaptation and Resilience to Climate Change in Cabo Verde	$4 012	CIDA	Bilateral	Grant
2016	Mitigation	Transversal	National OZONE Programme	$36 776	UNEP	Multilateral	Grant
2016	Adaptation	Water	Efficient Water Use and Wastewater Reuse for Environmental Protection in Cabo Verde	$263 630	GEF	Multilateral	Grant
2016	Adaptation	Water	Adaptation and Resilience to Climate Change in the Water Sector	$4 085	UNDP	Multilateral	Grant
2016	Mitigation	Waste	Implementation of the Basel Convention Voluntary Compliance Plan	$915	UNDP	Multilateral	Grant
2016	Adaptation	Agriculture	Increasing energy production and storage capacity by optimising the use of renewable energy for agricultural production and improving the processing and quality of the products of the Cutelo Capado Cooperative	$40 526	SGP GEF	Multilateral	Grant
2016	Adaptation	Agriculture	Grupo Agropecuário Lombo Caleceria Praia Branca	$28 368	SGP GEF	Multilateral	Grant
2016	Adaptation	Other	MultiAdpt project in the community of Covoada - São Lourenço dos Órgãos	$34 447	SGP GEF	Multilateral	Grant

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2016	Adaptation	Inclusion	Resilience and Adaptability of People with Disabilities: A Collaborative and Constructive Process of Socio-environmental Justice in Cabo Verde	$45 591	SGP GEF	Multilateral	Grant
2016	Adaptation	Transversal	Transform Fragata	$19 250	SGP GEF	Multilateral	Grant
2017	Mitigation	Energy	Project to Promote Solar Thermal Energy for Water Heating	$129 538	Spain	Bilateral	Technical assistance
2017	Mitigation	Transversal	National OZONE Programme	$33 933	UNEP	Multilateral	Grant
2017	Adaptation	Water	Efficient Water Use and Wastewater Reuse for Environmental Protection in Cabo Verde	$188 796	GEF	Multilateral	Grant
2017	Adaptation	Water	Adaptation and Resilience to Climate Change in the Water Sector	$35 498	UNDP	Multilateral	Grant
2017	Adaptation	Water	Efficient Water Use and Wastewater Reuse for Environmental Protection in Cabo Verde	$188 796	GEF	Multilateral	Grant
2017	Adaptation	Agriculture	Support for the promotion of new agricultural production technologies	$13 823	Japan	Bilateral	Food Aid
2017	Adaptation	Water	No Crê: Water for the Sustainable Development of the Northern Plateau	$1 725 500	SGP GEF	Multilateral	Grant
2018	Mitigation	Transversal	National OZONE Programme	$23 437	UNEP	Multilateral	Grant
2018	Mitigation	Agriculture	Emergency Drought Mitigation Programme - Water Scarcity Management	$441 887	Coop. Luxembourg	Bilateral	Grant
2018	Adaptation	Water Sanitation	Flexible Fund for Studies and Small Water and Sanitation Infrastructures	$22 007	Coop. Luxembourg	Bilateral	Grant
2018	Adaptation	Agriculture	Programme to Promote Socio-Economic and Rural Opportunities (Poser - Clima)	$606 158	FIDA	Multilateral	Grant
2018	Adaptation	Agriculture	Support for the promotion of new agricultural production technologies	$8 589	Japan	Bilateral	Food Aid
2018	Adaptation	Energy	Energy for Sustainable Development by Pascoal Alves	$49 770	SGP GEF	Multilateral	Grant
2018	Mitigation	Energy	Hybridisation of the Feeding System for the Ribom Bilim Pumping Station	$39 816	SGP GEF	Multilateral	Grant
2018	Mitigation	Energy	Photovoltaic system for pumping water for drip irrigation Justino Lopes - Santa Cruz	$34 839	SGP GEF	Multilateral	Grant

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2018	Mitigation	Energy	Reinforcement of the Drinking Water Supply System in João Afonso and Chã de Pedras	$398 158	SGP GEF	Multilateral	Grant
2018	Mitigation	Energy	Strengthening access to sustainable energy to increase income-generating activities in Monte Trigo, Santo Antão	$47 779	SGP GEF	Multilateral	Grant
2019	Adaptation	Agriculture	Implementation of the Reuse of Wastewater for Agriculture Project	$11 125	Spain	Bilateral	Grant
2019	Adaptation	Agriculture	Improving the Resilience of the Agricultural Sector in CV	$68 838	Spain	Bilateral	Grant
2019	Adaptation	Transversal	Cabo Verde Atmospheric Observatory	$32 656	Germany	Bilateral	Grant
2019	Mitigation	Transversal	Tools and Strategies to support Mitigation activities in key sectors in Cabo Verde	$2 049	BAD	Multilateral	Grant
2019	Mitigation	Transversal	National OZONE Programme	$24 591	UNEP	Multilateral	Grant
2019	Adaptation	Agriculture	Programme to Promote Socio-Economic and Rural Opportunities (Poser - Clima)	$608 951	FIDA	Multilateral	Grant
2019	Mitigation	Water Resources	Emergency Drought Mitigation Programme - Water Scarcity Management	$741 768	European Union	Multilateral	Grant
2019	Mitigation	Water Resources	Emergency Drought Mitigation Programme - Water Scarcity Management	$136 072	Coop. Luxembourg	Bilateral	Grant
2019	Adaptation	Agriculture	Support for the promotion of new agricultural production technologies	$441 079	Japan	Bilateral	Food Aid
2019	Adaptation	Agriculture	Introducing Hydroponics as an Alternative for Rainfed Production in the drier areas of São Lourenço dos Órgãos	$6 436	Coop. Luxembourg	Bilateral	Food Aid
2019	Adaptation	Agriculture	Massification of irrigation in the Alto Mira Valley and strengthening the agricultural production capacities of young farmers	$24 873	Coop. Luxembourg	Bilateral	Food Aid
2019	Adaptation	Agriculture	Ecological Agriculture to Improve Food Security in São Nicolau	$49 570	Coop. Luxembourg	Bilateral	Food Aid
2019	Adaptation	Agriculture	Agribusiness	$39 911	SGP GEF	Multilateral	Grant

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2019	Adaptation	Environment	Environmental Education and Awareness Campaign in the context of Climate Change	$29 933	SGP GEF	Multilateral	Grant
2019	Mitigation	Energy	Eco-Employment for Young People - Using solar energy for productive initiatives by 3 groups of young entrepreneurs on the island of São Vicente.	$29 933	SGP GEF	Multilateral	Grant
2019	Adaptation	Energy	Hybridisation of the Rebeirãozinho borehole - FSN 32	$31 430	SGP GEF	Multilateral	Grant
2019	Mitigation	Energy	Hybridisation of the Power Supply System for the Campo Porto Pumping Station - FSN 59	$27 937	SGP GEF	Multilateral	Grant
2019	Mitigation	Energy	Co-operation project between ADESBA-CL and CERMI to train 20 young people in renewable energy systems	$49 888	SGP GEF	Multilateral	Grant
2019	Adaptation	Energy	Conversion of the diesel pumping system to a renewable system at borehole FST 835 in Canto Grande - Ribeira de São Miguel	$18 958	SGP GEF	Multilateral	Grant
2019	Adaptation	Energy	Solar energy system in the isolated area of Calheta de São Martinho Grande	$23 448	SGP GEF	Multilateral	Grant
2020	Mitigation	Transport	Project Promoting electric mobility in Cabo Verde	$8 068 254	NAMA FACILITY	Multilateral	Grant
2020	Mitigation	Energy	Access to sustainable energy for water management: Energy-Water Nexus	$1 993 802	GEF	Multilateral	Grant
2020	Mitigation	Energy	Chã das Caldeiras electrification projects (with renewable energies)	$216 511	ECREEE	Multilateral	Grant
2020	Mitigation	Energy	Drawing up the National Bioenergy Action Plan		ECREEE	Multilateral	Technical assistance
2020	Adaptation	Agriculture	Implementation of the Wastewater Reuse for Agriculture Project	$107 556	Spain	Bilateral	Grant
2020	Adaptation	Agriculture	Improving the Resilience of the Agricultural Sector in CV	$4 154	Spain	Bilateral	Grant
2020	Mitigation	Meteorology	Cabo Verde Atmospheric Observatory	$32 218	Germany	Bilateral	Grant
2020	Mitigation	Transversal	Tools and Strategies to support Mitigation activities in key sectors in Cabo Verde	$3 048	BAD	Multilateral	Grant

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2020	Mitigation	Industry	National Ozone Programme	$107 070	UNEP	Multilateral	Grant
2020	Adaptation	Meteorology	Improving the Climate Basis in Cabo Verde	$3 032	WMO	Multilateral	Grant
2020	Adaptation	Agriculture	Support for the Promotion of New Agricultural Production Technologies	$837 015	Japan	Bilateral	Food Aid
2020	Adaptation	Agriculture	Introducing Hydroponics as an Alternative for Rainfed Production in the drier areas of São Lourenço dos Órgãos	$15 281	Coop. Luxembourg	Bilateral	Food Aid
2020	Adaptation	Sanitation	Waste Roadmap	$198 534	Portugal	Bilateral	Grant
2020	Mitigation	Energy	Bolona with Energy	$49 845	SGP GEF	Multilateral	Grant
2020	Mitigation	Energy	Implementing an electric propulsion system in artisanal fishing	$24 923	SGP GEF	Multilateral	Grant
2020	Adaptation	Inclusion	Inclusive mobility treadmill	$49 845	SGP GEF	Multilateral	Grant
2020	Mitigation	Energy	Submersible water pumping system using solar energy	$48 848	SGP GEF	Multilateral	Grant
2021	Mitigation	Energy	Energy Transition Support Project	$128 728	Coop. Luxembourg	Bilateral	Grant
2021	Mitigation	Energy	Renewable Energy Project and Improving Energy Efficiency in Public Services	$3 660 695	IRBD	Multilateral	Loan
2021	Mitigation	Energy	Renewable Energy Project and Improving Energy Efficiency in Public Services	$3 679 468	IDA	Multilateral	Loan
2021	Mitigation	Energy	Renewable Energy Project and Improving Energy Efficiency in Public Services	$7 358 936	CCEFCF	Multilateral	Grant
2021	Mitigation	Energy	Renewable Energy Project and Improving Energy Efficiency in Public Services	$525 638	CCEFCF	Multilateral	Grant
2021	Mitigation	Energy	Renewable Energy Project and Improving Energy Efficiency in Public Services	$2 102 553	GIF	Multilateral	Loan
2021	Adaptation	Agriculture	Improving the Resilience of the Agricultural Sector in CV	$78 015	Spain	Bilateral	Grant
2021	Adaptation	Agriculture	Implementing a project to Reuse Wastewater for Agriculture	$111 687	Spain	Bilateral	Grant
2021	Adaptation	Agriculture	Programme to Promote Socio-Economic and Rural Opportunities (Poser - Clima)	$1 650 962	FIDA	Multilateral	Grant
2021	Mitigation	Agriculture	Emergency Drought Mitigation Programme - Water Scarcity Management	$4 892	Coop. Luxembourg	Bilateral	Grant

Year	Type of support	Sector	Project name	Value	Donor	Type	Modality
2021	Adaptation	Agriculture	Development of Organic Farming in Aldeia de Norte Pn-Sa	$19 846	Coop. Luxembourg	Bilateral	Grant
2021	Adaptation	Agriculture	Massification of Drip Irrigation with a Focus on Reducing Food and Nutritional Insecurity	$24 136	Coop. Luxembourg	Bilateral	Grant
2021	Adaptation	Sanitation	Action Plan for the Reuse of Treated Wastewater	$91 529	Portugal	Bilateral	Grant
2021	Adaptation	Agriculture	Support for the Promotion of New Agricultural Production Technologies	$209 081	Japan	Bilateral	Food Aid
2022	Mitigation	Energy	Preparation of a feasibility study for the production of green hydrogen in Cabo Verde	$218 721	Coop. Luxembourg	Bilateral	Technical assistance
2022	Adaptation	Forests	Conservation and Sustainable Use of Forest Resources	$64 865	Spain	Bilateral	Grant
2022	Adaptation	Agriculture	Improving the Resilience of the Agricultural Sector in Cabo Verde	$306 512	Spain	Bilateral	Grant
2022	Adaptation	Meteorology	Cabo Verde Atmospheric Observatory	$110 493	Germany	Bilateral	Grant
2022	Mitigation	Transversal	National Ozone Programme	$51 445	UNDP	Multilateral	Grant
2022	Adaptation	Agriculture	Programme to Promote Socio-Economic and Rural Opportunities (Poser - Clima)	$547 342	FIDA	Multilateral	Grant
2022	Transversal	Transversal	Fourth National Communication on Climate Change - 4 CN	$25 771	UNDP	Multilateral	Grant
2022	Mitigation	Water	Roadmap for Establishing a Policy for Preventing and Managing Water Use in Scarcity Situations	$68 435	Portugal	Bilateral	Grant
2022	Mitigation	Ocean	Cabo Verde - Becoming A Future Island Nation	$205 564	Portugal	Bilateral	Grant
2022	Adaptation	Sanitation	Waste Roadmap in Cabo Verde - Phase 5	$129 050	Portugal	Bilateral	Grant
2022	Adaptation	Agriculture	Resilience of the Agricultural Sector to Climate Change in CV	$454 291	Japan	Bilateral	Food Aid
2022	Adaptation	Agriculture	Support for the Promotion of New Agricultural Production Technologies	$125 217	Japan	Bilateral	Food Aid
2022	Adaptation	Agriculture	ECOWAS Agroecological Programme - Cabo Verde	$10 027	ECOWAS	Multilateral	Grant
2022	Adaptation	Marine Resources	Resiliensea	$3 320	MAVA	Bilateral	Grant
2022	Adaptation	Food safety	Agricultural Sector Resilience - Food Security	$40 027	Japan	Bilateral	Food Aid
2022	Adaptation	Agriculture	Farming / Drip irrigation and goat and sheep farming	$43 180	SGP GEF	Multilateral	Grant