# VATICAN CITY STATE

First National Communication

United Nations Framework Convention on Climate Change

**2025**

SUMMARY

# INTRODUCTION

"*Environmental justice – implicitly proclaimed by the prophets – can no longer be regarded as an abstract concept or a distant goal. It is an urgent need that involves much more than simply protecting the environment. For it is a matter of justice – social, economic and human. For believers it is also a duty born of faith, since the universe reflects the face of Jesus Christ, in whom all things were created and redeemed. In a world where the most vulnerable of our brothers and sisters are the first to suffer the devastating effects of climate change, deforestation and pollution, care for creation becomes an expression of our faith and humanity*"[1].

Climate change is a global social question and one intimately related to the dignity of human person. Its impact "*will increasingly prejudice the lives and families of many persons. We will feel its effects in the areas of healthcare, sources of employment, access to resources, housing, forced migration, etc.*"[2].

The Holy See and the Vatican City State (VCS) are committed to tackling climate change and promoting sustainable development through environmental policies and energy efficiency strategies and "*to continue the important work of caring for creation*".[3]

In 2020, Pope Francis set the Holy See's and the VCS's goal of achieving climate neutrality by 2050 while encouraging *education in integral ecology* in order to promote new lifestyles based on sustainability, fraternity and the covenant between human beings and the environment.

It is necessary to bring together all human forces in favor of an integral ecology[4], with a view to ensuring that God's creation be respected and safeguarded, now and in the foreseeable future: the prevention of climate change and the fight against extreme poverty are interdependent, requiring a new model of development that integrates economic solidarity and justice.

This first National Communication presents the *uniqueness* of the Holy See and the VCS and outlines the actions taken to achieve their 'climate commitments' made at the international level in order to promote a transition towards integral ecology.

[1] Pope Leo XIV, *Message for the 10th World Day of Prayer for the Care of Creation*, 1 September 2025.
[2] Pope Francis, Apostolic Exhortation *Laudate Deum*, 4 October 2023, n. 2.
[3] Pope Leo XIV, *Homily in the Holy Mass for the Care of Creation*, Borgo Laudato si' (Castel Gandolfo), 9 July 2025.
[4] Cf. Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, chapters four and five.

## CHAPTER ONE

## National circumstances

### 1 – General considerations

The Vatican City State (VCS) was created by the Treaty between the Holy See and Italy on 11 February 1929 (the Lateran Treaty) in order to ensure that the Holy See enjoys *"absolute and visible independence and to guarantee its indisputable sovereignty even in the international field"*[5]. It is located in the city of Rome on the Vatican Hill and occupies an area of 0.44 square kilometers. The VCS's territory is partly surrounded by walls and includes St. Peter's Square. There are five entrances into the State, monitored by the Pontifical Swiss Guard and by the Gendarmerie Corps.

Although the Holy See has a unique spiritual mission, it is formally recognized as a State under international law and practice, having the same rights and obligations as every other State. Although it is not territorial in nature, at present, the Holy See exercises sovereignty over the territory of the VCS. It should be noted, however, that the Holy See does not exercise jurisdiction, as that term is understood in international law, over individual Catholics and institutions located outside the territory of the VCS. Each member of the Catholic Church is subject to the laws of the respective State in which she or he lives. Therefore, when the Holy See ratified, in the name and on behalf of the VCS, the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, in order to avoid any doubt, it declared that it committed to observe its provisions exclusively within the territory of the VCS, as circumscribed by the *Leonine Walls*[6].

### 2 – Government system

The Pope enjoys full legislative, executive and judicial powers in the VCS. Those competences have been delegated to a series of governmental bodies. In particular, the legislative functions have been delegated to the Pontifical Commission for the VCS. The executive powers have been delegated to the Governorate of the VCS, which provides for the functioning and administration of the State with its Departments and Central Offices. In matters of considerable importance, the Governorate fulfills its functions in agreement with the Secretariat of State of the Holy See. The judicial power is exercised by the Tribunal of the VCS, the Court of Appeal and the Court of Cassation. The investigative and prosecutorial functions are exercised by the Office of the Promoter of Justice.

### 2.1 – Engagement on climate change issues

In order to strengthen its efforts to promote sustainable development, on 5 May 2008, the Holy See acceded, in the name and on behalf of the VCS, to the *Vienna Convention for the Protection of the Ozone Layer* as well as to the *Montreal Protocol on Substances that Deplete the Ozone Layer* and its first four Amendments. On 17 June 2020, it ratified the *Kigali Amendment to the Montreal Protocol.*

On 4 July 2022, the Holy See acceded, in the name and on behalf of the VCS, to the *United Nations Framework Convention on Climate Change* (UNFCCC) as a non-Annex I Party, and, on 4 September 2022, it acceded to the *Paris Agreement*.

[5] Treaty agreed between the Holy See and Italy, *Preamble*, 11 February 1929.
[6] Cf. *Declaration* annexed to the Instrument of Accession of the Holy See, acting in the name and on behalf of Vatican City State, to the United Nations Framework Convention on Climate Change, 4 July 2022.

The VCS submitted its first *Nationally Determined Contributions* (NDCs) on 31 May 2023, aware that climate change, having "*not only environmental, but also ethical, social, economic and political relevance, affect[s] above all the life of the poorest and most fragile. In this way [climate change] appeal[s] to our responsibility to promote, through collective and joint commitment, a culture of care, which places human dignity and the common good at the center*"[7].

The jurisdiction is moving towards a more integral and integrating model of development, based on responsibility and solidarity: two fundamental values that must guide the implementation of both the UNFCCC and the Paris Agreement.

The Holy See dedicates particular attention to international cooperation, understood as dialogue and collaboration between States, in order to strengthen the global response to the threat of climate change both through the reduction of emissions and through adaptation to climate change. The VCS remains committed to the long-term temperature goal set by the Paris Agreement and, to that end, has adopted a decarbonized, resilient and solidarity-based development path, fully in line with its international commitments.

## 3 – Population

Pursuant to the *Law on Citizenship, Residence and Access* of 22 February 2011 No. CXXXI, Cardinals residing in Rome, diplomats of the Holy See, and those residing in the Vatican for reasons of service are citizens of the VCS. Citizenship is lost if the person no longer resides in Vatican territory or leaves the diplomatic service. Currently there are 887 inhabitants, including citizens and residents[8].

The number of the residents is not statistically significant, since goods and services in the VCS are provided mostly to a large number of non-residents. Indeed, in addition to residents and citizens, access to the territory of the VCS is allowed to other people who obtain a permit to remain in Vatican territory for the time corresponding to the needs for which it was granted. The transient population of the State is approximately 6.000 people, to which are added those individuals who use the goods and services provided by the State (family members, pensioners, beneficiaries of the Health Fund and professional collaborators).

## 4 – Economy

The State uses the Euro (€) as its official currency, which has legal tender in accordance with the provisions of the *Monetary Convention* signed between the VCS and the European Union in December 2009.

The VCS does not have a system of production nor a Gross Domestic Product (GDP). The sale of any product within the jurisdiction is controlled by the State, which directs the economic, financial and professional sectors. All real estate is owned by the State.

## 5 – Transport

Given the territorial size of the VCS, its transportation network is negligible. It has a heliport located in the Vatican Gardens, used for official purposes and medical emergencies. There is also an 852-metre railway network that connects the VCS to the Italian railway network. It is currently used for the inbound and outbound transit of goods. The road network consists exclusively of urban roads: streets, avenues and St. Peter's Square. There are no scheduled public transport vehicles.

[7] Pope Francis, *Video-Message for the Climate Ambition Summit*, 12 December 2020.
[8] Population data provided by the Civil State Office as of 17 December 2024 – Governorate.

As shown in the table below, from 2011 to November 2024, 1.294 vehicles were registered in the VCS, of which 882 are used for working purposes[9]:

VEHICLE REGISTRATIONS 2011-2024 - TOTAL REGISTRATIONS 1.294

| | |
|---|---|
| 2011 | 90 |
| 2012 | 104 |
| 2013 | 95 |
| 2014 | 77 |
| 2015 | 102 |
| 2016 | 93 |
| 2017 | 87 |
| 2018 | 92 |
| 2019 | 86 |
| 2020 | 105 |
| 2021 | 58 |
| 2022 | 55 |
| 2023 | 101 |
| 2024 | 149 |

## 6 – Climate

The VCS enjoys the temperate climate of central Italy, with mild temperatures: temperate but rainy winters, and hot/dry summers. In the last ten years it has been necessary to use heating during the winter months, while the use of air conditioning systems during the summer months has increased.

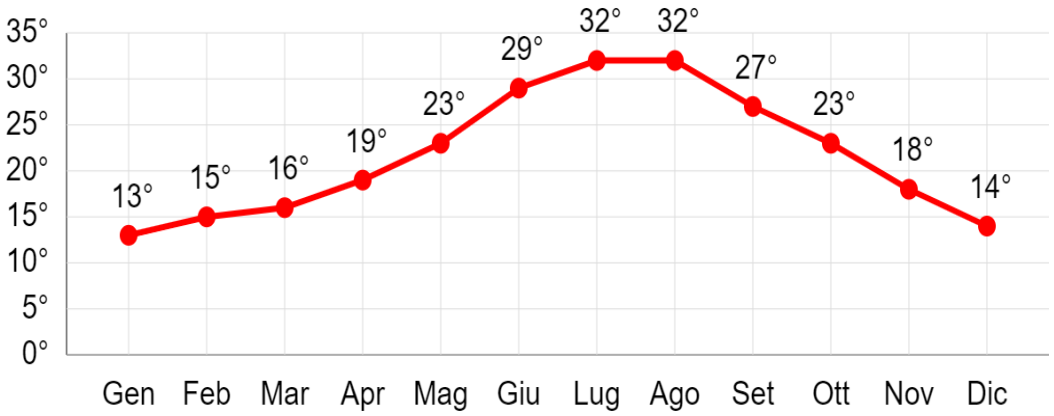
| **2023** | Gen | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average maximum temperature (°C)** | **13,5** | **14,9** | **17,8** | **19,5** | **24** | **29,5** | **34,2** | **32,5** | **30,4** | **26,8** | **19** | **15,7** |
| **Average minimum temperature (°C)** | **6,2** | **4,8** | **9,1** | **9,8** | **15,1** | **19,3** | **23,4** | **21,6** | **19,6** | **17,2** | **10,8** | **7,9** |
| **Precipitation (mm)** | 64,3 | 29,8 | 28,5 | 94,5 | 111,6 | 199,6 | 19,8 | 36,9 | 11,1 | 54,9 | 105,3 | 24,7 |

In recent years, average annual and monthly maximum and minimum temperatures have increased steadily.

### 6.1 – Average monthly temperature in Vatican City State

The graph below shows the average monthly maximum temperatures in VCS in Celsius; the average is calculated based on the temperatures recorded monthly in recent years.

[9] Data on vehicle registration number (SCV, CV) provided by the Vatican Vehicle Registry Office, as of 17 December 2024.




### 6.2 – Future trends

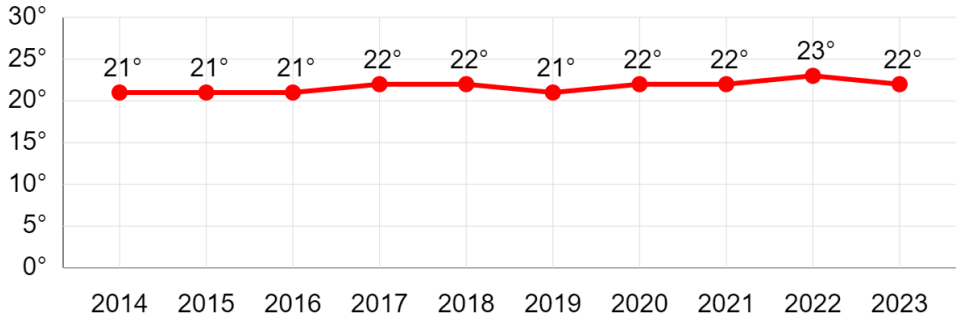
The VCS's climate has changed over the last 24 years. Temperatures have increased while rainfall has decreased, with extreme weather events, thermal anomalies and periods characterized by little or no rainfall and high temperatures. Heat waves and droughts are becoming more frequent.

From 2011 to 2050, a general increase in temperature in all seasons is expected, with an increased energy demand for cooling in summer exceeding the decline in energy consumption for winter heating. Summer cooling needs could increase by up to 50% while rainfall will decrease, especially in spring and summer months.

The growing frequency and intensity of extreme weather phenomena will not only affect the supply of energy but could also damage the cultural and artistic heritage preserved within the VCS. Extreme events could cause structural damage to buildings, as well as favor the formation of salts that accelerate corrosion. The increase in atmospheric $CO_2$ combined with precipitation will generate an increase in the chemical dissolution of carbonate stone materials by up to 30%. The stone monuments that constitute part of the cultural heritage could be damaged by thermal stress[10].

### 6.3 – Annual temperature in the Vatican City State

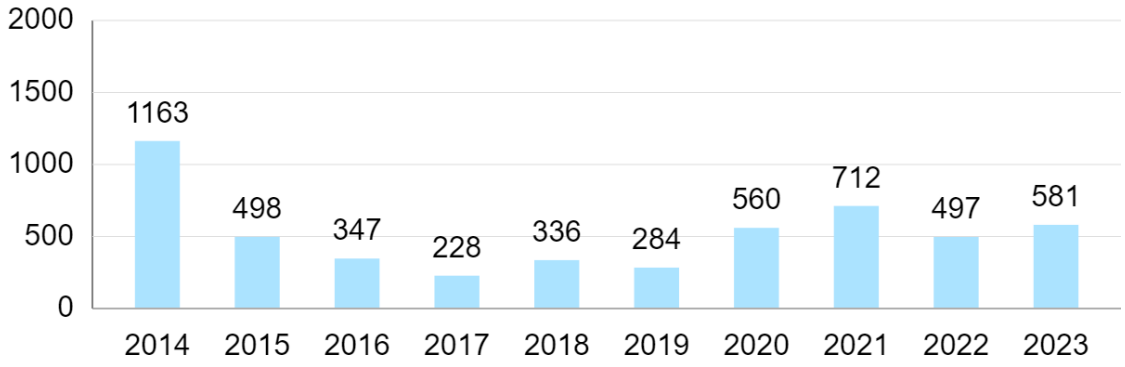
This graph shows the average annual temperature in the VCS, in degrees Celsius. The annual temperature is the average of the total monthly temperatures of that year.




### 6.4 – Annual rainfall in the Vatican City State

The graph below shows the total amount of annual rainfall over the past 10 years, measured in millimeters. The total amount of annual precipitation, is the sum of the monthly precipitation for that year.

[10] Cf. Cristina Sabbioni, Alessandra Bonazza, Palmira Messina, "Global Climate Change and Archaeological Heritage: Prevision, Impact and Mapping", in Nicolò Marchetti and Ingolf Thuesen (eds.), *ARCHAIA Case Studies on Research Planning, Characterization, Conservation and Management of Archaeological Sites*. Oxford: Archaeopress, 2008.




**7 – Gardens**

Almost a third of the VCS territory, about thirteen hectares, is covered with gardens. Nevertheless, the entire territory (44 hectares) falls within the IPCC (2006, 2019) definition of *Settlement land use*. In fact, the land used for gardens, parks and green areas is functionally and administratively associated with the Vatican headquarters.

The entire surface of the VCS has not undergone any land use change since 1970, as confirmed by the images on *Google Earth Pro* (2022 Google LLC).

The tables below show the matrices of land use and change in the VCS; since the entire area is classified as *Settlement* and there have been no changes in land use, the matrices show the entire total area in the *Settlement category*.

| | | 2022 | | | | | | Total 2021 |
|---|---|---|---|---|---|---|---|---|
| | surface in ha | Forest land | Grassland | Cropland | Wetland | Settlement | Other land | |
| 2021 | Forest land | | | | | | | |
| | Grassland | | | | | | | |
| | Cropland | | | | | | | |
| | Wetland | | | | | | | |
| | Settlement | | | | | 44 | | 44 |
| | Other land | | | | | | | |
| | Total 2022 | | | | | 44 | | |
| | Land converted to: | | | | | | | |

In the VCS there are only mineral soils; organic soils are absent. From 2017 to 2023, numerous soil samples were taken in different parts of the Vatican Gardens which revealed:

- a diversity of soils between one area and another, with low thickness of the cultivation bed;
- considerable presence of yellow sand below a depth of 20-30 cm;
- deficiencies in both nutrients and widespread organic substances, in some cases leading to plant poisoning, with often conspicuous leaf alterations;
- deficiencies of organic matter, such as: nitrogen, phosphorus and boron, which are being remedied with targeted fertilizations by area and by type of plant essence.

The supply of organic matter is, therefore, one of the objectives of the ongoing fertilization plans.

The analysis of soil samples has shown an excessive accumulation of chlorine and sodium, which has caused leaf browning especially on box hedges and laurel. To overcome this problem, some tests have been carried out with products based on plant extracts, capable of improving the absorption of nutrients and compensating for the excess in the soil of the two elements mentioned. In 2020, the distribution was extended to all box hedges.

To facilitate the *ecological transition*, in 2017 the VCS launched the "*Organic Gardens*" project, an eco-compatible system for the management and maintenance of the gardens, with the goal of extending the program in future years to include management in organic farming. The project, inspired by Pope Francis' Encyclical Letter *Laudato si',* aims at creating a model of sustainability within the Vatican Gardens that can then be extended to other areas under Vatican management.

Considering the newness and complexity of the project, it has been divided into several operational phases. These include defining strategies and management methods that are innovative in terms of effectiveness, aimed at protecting the environment of the Gardens, as well as training the staff in charge and those who have access to the Gardens.

Since September 2017, synthetic products used for the protection and fertilization of plants and meadows have been gradually replaced with organic natural products and cultivation techniques with low environmental impact.

The goal of achieving complete organic management by 2022 has been achieved, as the containment of parasites takes place with natural pesticides and fertilization done exclusively with certified organic fertilizers.

In 2015, the use of *glyphosate* as an herbicide agent was phased out, switching to *pelargonic acid*, a derivative of the grass family. The goal of this project is to strengthen the protection of the flora while respecting biodiversity. In the creation of a healthy environment for the plant world, emphasis was also placed on the optimization of spaces and the reintegration of the flora that over the years has been cut down for various reasons. In fact, numerous new trees have been planted, including oaks, cypresses, cedars, and lime trees, typical of the Mediterranean scrub family.

Particular attention has been paid to the pruning of the various tree and shrubs present in the Gardens. Targeted interventions have been scheduled according to the specificities and best techniques for each species, with the aim of both optimizing execution times and improving the aesthetic conformity of the plants. The indiscriminate felling of important species such as the *Holm Oak* (*Quercus ilex*), which would diminish the arboreal heritage of the Vatican Gardens, has been avoided.

In addition, an operational program was developed, leading to the creation in March 2024 of the *Pruning Operational Manual*.

The Garden Service has provided for:

- the creation of the VCS tree cadaster, where types and quantities of existing species have been identified. This is useful for assessing both the average age and the state of conservation of the existing tree heritage;
- the development of the VCS's reforestation program, leading to the planting of 300 trees of different species in three years;
- the renovation of the new watering system of the Vatican Gardens, which had not been updated since the 1930s. With the current plant, water resources have been optimized by about 60%, utilizing a solution that includes not only better management of resources but also provides better protection for the ecosystem while ensuring the necessary quantities of water.

The main objective of the "*Organic Gardens*" project is to recreate a balanced and healthy ecosystem within the Vatican Gardens, in which the plants are protected, nourished and irrigated correctly. To enforce it, staff in charge of the maintenance of the greens are properly trained, through periodic refresher courses on new environmental management techniques.

In 2017, a *Field Notebook* was prepared in which all the treatments and fertilizations carried out are recorded daily, reporting the operator, the area of intervention, the species treated, and the product and doses used. In addition, any parasites that required containment are reported. The field notebook, prepared in both paper and digital formats, provides a historical record of the interventions carried out in the gardens with the view to evaluating the most appropriate solutions for pathogen control from year to year. Thus, it has been possible to evaluate the effectiveness of the interventions over time and determine which cultivation practices are to be adopted, the specific products for each pest, and the times and doses to be used.

As far as plant nutrition is concerned, only the use of certified organic fertilizers is envisaged, with the main purpose of recreating the right content of organic matter in the soil and gradually bringing nutrients to the plants according to the needs that have been identified on the basis of specific analyses.

Of fundamental importance is the *new irrigation system*, which resulted in a *reduction of about 60% of water usage in 2020*. With the new irrigation project, more resistant pipes and automatic timers have been installed. The new layout covers the entire surface of the gardens of the VCS. The construction of the new system has thus made it possible to achieve the following objectives:

- significant savings in water resources, with targeted distribution of water in short and repeated shifts during the week, according to the actual need for meadows;
- reduction of chemical elements harmful to plants, in relation to the rationalization of the quantities of water distributed;
- containment of fungal parasites of the trunk and roots following the management of sprinklers, made in such a way as to avoid as much as possible that the jet of water hits those parts of the plant;
- remote control of the sensor system, in order to implement irrigation shifts and irrigation times based on the real water needs of the lawn surfaces.

## 8 – Energy

The VCS does not have fossil fuel resources or significant energy production facilities, therefore it relies on the import of energy through the international market.

The energy consumption in 2022 amounted to:

- electricity: 29.9 GWh
- methane gas: 1,712,000.00 smc.

During the year 2022, the substances imported were:

- 32 kg (0.032 t) of R404a corresponding to 125.50 $tCO_{2eq}$;
- 448 kg (0.448 t) of R410a corresponding to 935.42 $tCO_{2eq}$;
- 16 kg (0.016 t) of regenerated R507a corresponding to 63.76 $tCO_{2eq}$;
- 5 kg (0.005 t) of R407c corresponding to 8.87 $tCO_{2eq}$;
- 80 kg (0.80 t) of R134a corresponding to 114.40 $tCO_{2eq}$;

for a total of 1,247.96 $tCO_{2eq}$ <1252.80 $tCO_{2eq}$ (10% reduction imposed by the Kigali amendment on the value of the basic VCS level).

# CHAPTER TWO

## National Greenhouse Gas Inventory

The Vatican City State (VCS) greenhouse gas emissions are calculated using the IPCC methodology and are reported in terms of tons of $CO_2$ equivalent, applying the emission coefficients of each compound.

The following table and graphs show the $CO_2$ eq [kt] emission values from 2011 (base year) to 2022 by use sector and by gas.

**Table 1** – $CO_2$ eq emission values from 2022 to 2022 [kt]

| Description | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total $CO_2$ equivalent emissions | 19,33 | 17,20 | 18,08 | 17,65 | 17,30 | 16,50 | 17,04 | 16,03 | 15,90 | 15,95 | 15,38 | 15,89 |
| 1. Energy (kt $CO_2$ eq.) | 17,70 | 17,20 | 17,10 | 15,81 | 16,18 | 15,31 | 15,44 | 14,81 | 14,92 | 12,73 | 14,57 | 14,71 |
| 2. IPPU (kt $CO_2$ eq.) | 1,63 | 0 | 0,98 | 1,83 | 1,12 | 1,19 | 1,60 | 1,22 | 0,98 | 3,22 | 0,82 | 1,18 |
| **GHG emissions totals** | **19,33** | **17,20** | **18,08** | **17,65** | **17,30** | **16,50** | **17,04** | **16,03** | **15,90** | **15,95** | **15,38** | **15,89** |
| $CO_2$ (kt) | 17,56 | 17,06 | 16,96 | 15,69 | 16,06 | 15,19 | 15,33 | 14,70 | 14,81 | 12,65 | 14,47 | 14,60 |
| $CH_4$ (kt $CO_2$ eq.) | 0,05 | 0,05 | 0,04 | 0,04 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,02 | 0,03 | 0,03 |
| $N_2O$ (kt $CO_2$ eq.) | 0,09 | 0,10 | 0,09 | 0,09 | 0,09 | 0,08 | 0,08 | 0,08 | 0,08 | 0,06 | 0,07 | 0,08 |
| HFCs (kt $CO_2$ eq.) | 1,63 | NO | 0,98 | 1,83 | 1,12 | 1,19 | 1,60 | 1,22 | 0,98 | 3,22 | 0,82 | 1,18 |

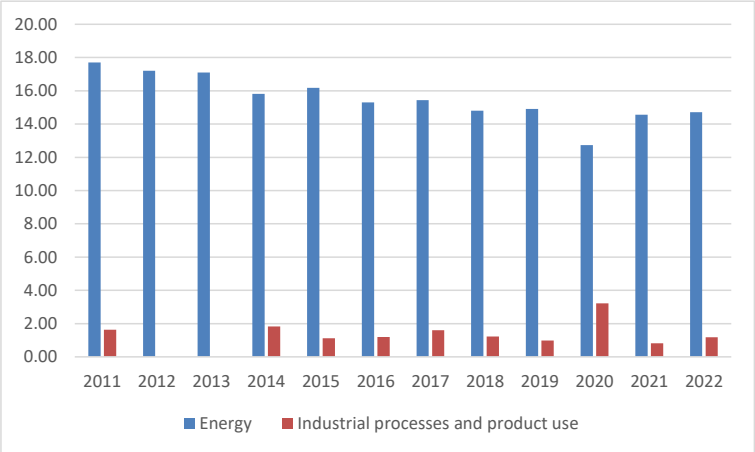



**Figure 1 -** GHG emissions by sector [kt $CO_2$ eq]

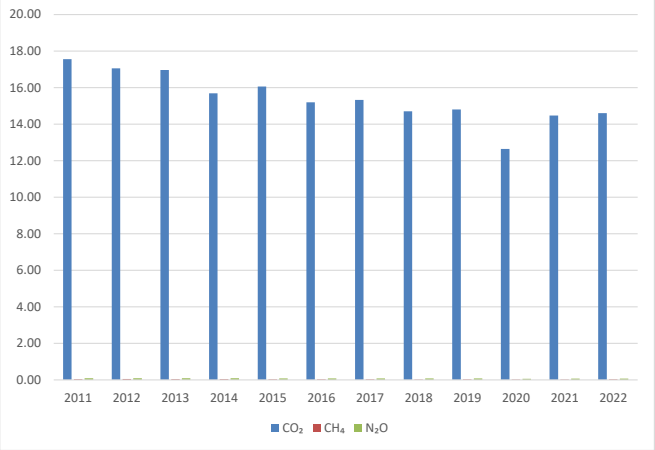



**Figure 2 -** GHG emissions by gas [kt $CO_2$ eq]

The 2022 inventory of emissions contains estimates of the annual quantities of anthropogenic emissions of methane ($CH_4$), carbon dioxide ($CO_2$) and nitrous oxide ($N_2O$).

Since the Holy See acceded, in the name and on behalf of the VCS, to the United Nations Framework Convention on Climate Change (UNFCCC) as a Non-Annex I Party, it was decided to carry out an initial survey of greenhouse gas emissions referring to the year 2022. While not the base year for the Convention, it is the year in which the VCS had more complete data available, which was necessary for the redaction of the inventory. 2022 is also the year for which the VCS presented its first Biennial Transparency Report (BTR).

## 1 – Total emissions

The IPCC guidelines for the following categories were used to compile the national greenhouse gas inventory:

- *Energy*: greenhouse gas emissions from combustion and direct emission of fuels. They include emissions from thermal power plants, transport, and residential and commercial buildings.
- *Industrial Processes*: greenhouse gas emissions due to technological processes (emissions from fuel combustion are included in the Energy section).
- *Forests and land use change*: greenhouse gas emissions and removals due to forests and land use change.

Table 2 shows the 2022 greenhouse gas emissions in $tCO_{2eq}$ of the VCS, separated by sector.

**Table 2** – Total emissions in $CO_2$ equivalents of the Vatican City State in the year 2022.

| **Sectors** | | **$tCO_{2eq}$** |
|---|---|---|
| **1. Energy** | | |
| | 1.1A Petrol Automotive | 5,660.37 |
| | 1.1B Diesel fuel for transport | 5,590.76 |
| | 1.2A Gas Heating | 3,459.37 |
| | | |
| **2. Industrial processes and other uses** | | |
| | 2.1 HFC | 1,175.96 |
| | | |
| **3. LULUCF** | | -25.31[11] |
| | | |
| **Total** | | 15,861.15 |

For the energy sector (heating and transport), the use of $HFC_s$ (air conditioning and industrial refrigeration) and land use data that allowed the implementation of the national emission inventory was collected.

Since there are no electricity production plants, industries or waste disposal plants in the territory, almost all greenhouse gas emissions arise from the use of fossil fuels for transport and heating.

[11] The LULUCF emissions value is included for the first time in Table 2 (emissions were not accounted in BTR1).

The data indicates that, in the year 2022, the Vatican produced about 15,886.46 tons of $CO_2$ equivalent (excluding LULUCF).

Tables 3 and 4, summarize the total emissions, aggregated by macro-sector.

About 71% of $CO_2$ production is due to fuel consumption in the transport sector, which necessarily includes the consumption produced by non-residents who work in the VCS or who come to the territory for tourism or other reasons and that of methane gas used in thermal power plants (about 22%).

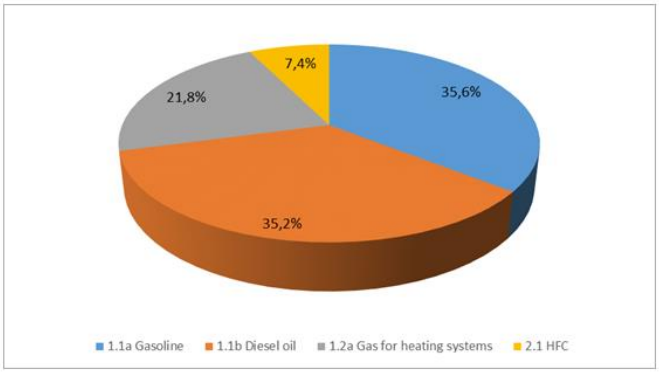



**Figure 3** – Percentage of greenhouse gas emissions in $CO_2$ equivalents in the VCS (2022)

## 2 – Analysis of estimates by type of substance

For each of the substances considered, a brief note describing their main characteristics and origins is provided below. The "Global Warming Potential" (GWP) indicates the ratio between the warming induced by a generic greenhouse gas and that induced by the same amount of $CO_2$.

## 3 – Methane ($CH_4$)

Methane has a GWP = 21. Methane emissions in the VCS are due mostly to the use of fossil fuels in the transport sector (petrol and diesel).

## 4 – Carbon monoxide (CO)

Carbon monoxide emissions (GWP = 2) are due to imperfect combustion and are produced mainly by the transport sector, which confirms that this is a typical traffic pollutant, and by the thermal power plants.

## 5 – Carbon dioxide ($CO_2$)

$CO_2$ emissions in the VCS derive mostly from the use of fossil fuels in the transport and heating sectors.

## 6 – Nitrous oxide ($N_2O$)

Nitrous oxide, given its great influence on the global greenhouse effect (GWP=320), is of particular interest when identifying possible interventions for the reduction of emissions. In the VCS, emissions of this gas derive mainly from the transport sector.

**7 – Non-methane volatile organic compounds ($NMVOC_s$)**

Conventionally, this heading includes thousands of different substances from a variety of sources. They can be released as they are used (since they are volatile at room temperature) or because they undergo partial oxidation processes. Some of these are particularly dangerous or toxic, like benzene and PAHs (Polycyclic Aromatic Hydrocarbons), which have proven carcinogenic effects.

Organic compounds, together with nitrogen oxides, act as precursors of complex photochemical cycles, which produce ozone as well as organic peroxides, nitrate ions and sulfate, which in turn contribute to the formation of free radicals, strongly oxidized substances and PM10 (Airborne Particular Matter with a diameter of 10 microns or less).

**8 – Nitrogen oxides ($NO_X$)**

Nitrogen oxides are the sum of nitrogen oxide (NO), and nitrogen dioxide ($NO_2$).

Through photochemical cycles, nitrogen oxides also form nitrates, which are significant constituents of fine dust.

Nitrogen oxides are produced by the oxidation of nitrogen contained in the air, whatever fuel is used. In the VCS, NOx emissions are almost entirely caused by combustion processes, especially in the transport and heating sectors.

# TABLE 3 - SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES

2022
VAT-CRT-2024-V0.2
Holy See

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | Net $CO_2$ emissions/ removals | $CH_4$ | $N_2O$ | HFCs [1] | PFCs [1] | Unspecified mix of HFCs and PFCs [1] | $SF_6$ | $NF_3$ | $NO_x$ | CO | NMVOC | $SO_X$ | Total GHG emissions/removals [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (kt) | | | $CO_2$ equivalents (kt) [3] | | | (kt) | | | | | | $CO_2$ equivalents (kt) [3] |
| **Total national emissions and removals** | **14,60** | **0,00** | **0,00** | **1,18** | **NA,NO** | **NO** | **NO** | **NO** | **NA,NO** | **NA,NO** | **NA,NO** | **NA,NO** | **15,89** |
| **1. Energy** | **14,60** | **0,00** | **0,00** | | | | | | **NO** | **NO** | **NO** | **NO** | **14,71** |
| 1.A. Fuel combustion | 14,60 | 0,00 | 0,00 | | | | | | NO | NO | NO | NO | 14,71 |
| 1.A.1. Energy industries | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 1.A.2. Manufacturing industries and construction | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 1.A.3. Transport | 11,14 | 0,00 | 0,00 | | | | | | NO | NO | NO | NO | 11,25 |
| 1.A.4. Other sectors | 3,46 | 0,00 | 0,00 | | | | | | NO | NO | NO | NO | 3,46 |
| 1.A.5. Other | | | | | | | | | | | | | |
| 1.B. Fugitive emissions from fuels | NE,NO | NE,NO | NO | | | | | | NO | NO | NO | NO | NE,NO |
| 1.B.1. Solid fuels | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 1.B.2. Oil and natural gas and other emissions from energy production | NE,NO | NE,NO | NO | | | | | | | | | | NE,NO |
| 1.C. $CO_2$ Transport and storage | | | | | | | | | | | | | |
| **2. Industrial processes and product use** | **NO** | **NO** | **NO** | **1,18** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **NO** | **1,18** |
| 2.A. Mineral industry | NO | | | | | | | | | | | NO | NO |
| 2.B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| 2.C. Metal industry | NO | NO | | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| 2.D. Non-energy products from fuels and solvent use | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 2.E. Electronic industry | | | NO | NO | NO | NO | NO | NO | | | | | NO |
| 2.F. Product uses as substitutes for ODS | | | | 1,18 | NO | NO | NO | NO | | | | | 1,18 |
| 2.G. Other product manufacture and use | | | NO | NO | NO | NO | NO | NO | | | | | NO |
| 2.H. Other [4] | | | | NO | NO | NO | NO | NO | | | | | NO |
| **3. Agriculture** | **NO** | **NA, NO** | **NA,NO** | | | | | | | | **NO** | | **NA,NO** |
| 3.A. Enteric fermentation | | NO | | | | | | | | | | | NO |
| 3.B. Manure management | | NO | NA,NO | | | | | | | | NO | | NA,NO |
| 3.C. Rice cultivation | | NO | | | | | | | | | NO | | NO |
| 3.D. Agricultural soils | | | NO | | | | | | | | | | NO |
| 3.E. Prescribed burning of savannahs | | | | | | | | | | | | | |
| 3.F. Field burning of agricultural residues | | NA | NA | | | | | | | | | | NA |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.G. Liming | NO | | | | | | | | | | | | NO |
| 3.H. Urea application | NO | | | | | | | | | | | | NO |
| 3.I. Other carbon-containing fertilizers | NO | | | | | | | | | | | | NO |
| 3.J. Other | | | | | | | | | | | | | |
| **4. Land use, land-use change and forestry** [5] | **NE,NO** | **NO** | **NA,NO** | | | | | | **NO** | **NO** | **NO** | **NO** | **NA,NE,NO** |
| 4.A. Forest land [5] | NE,NO | NO | NO | | | | | | NO | NO | **NO** | | NE,NO |
| 4.B. Cropland [5] | | | | | | | | | | | | | |
| 4.C. Grassland [5] | | | | | | | | | | | | | |
| 4.D. Wetlands [5] | | | | | | | | | | | | | |
| 4.E. Settlements [5] | | | NA,NO | | | | | | | | | | NA,NO |
| 4.F. Other land [5] | | | | | | | | | | | | | |
| 4.G. Harvested wood products [5] | | | | | | | | | | | | | |
| 4.H. Other [5] | | | | | | | | | | | | NO | |
| **5. Waste** | **NO** | **NA, NO** | **NO** | | | | | | **NA,NO** | **NA,NO** | **NA,NO** | **NO** | **NA,NO** |
| 5.A. Solid waste disposal [6] | | **NA** | | | | | | | **NA** | **NA** | **NA** | | NA |
| 5.B. Biological treatment of solid waste | | NO | NO | | | | | | NO | NO | NO | | NO |
| 5.C. Incineration and open burning of waste [6] | **NO** | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 5.D. Wastewater treatment and discharge | | NO | NO | | | | | | NO | NO | NO | | NO |
| 5.E. Other [6] | | | | | | | | | | | | | |
| **6. Other** ***(please specify)*** [7] | **NA** | **NA** | **NA** | **NA** | **NA** | **NO** | **NO** | **NO** | **NA** | **NA** | **NA** | **NA** | **NA,NO** |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Memo items:** [8] | | | | | | | | | | | | | |
| **1.D.1. International bunkers** | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 1.D.1.a. Aviation | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| 1.D.1.b. Navigation | NO | NO | NO | | | | | | NO | NO | NO | NO | NO |
| **1.D.2. Multilateral operations** | | | | | | | | | | | | | |
| **1.D.3. $CO_2$ emissions from biomass** | 0,36 | | | | | | | | | | | | 0,36 |
| **1.D.4. $CO_2$ captured** | | | | | | | | | | | | | |
| **5.F.1. Long-term storage of C in waste disposal sites** | NO | | | | | | | | | | | | NO |
| **Indirect $N_2O$** | | | NA,NO | | | | | | | | | | NA,NO |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indirect $CO_2$** | NA,NO | | | | | | | | | | | | NA,NO |

[1] The emissions of HFCs, PFCs, unspecified mix of HFCs and PFCs and other F-gases are to be expressed as $CO_2$ eq. emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in table 2(II) of this common reporting format.

[2] "Total GHG emissions/removals" does not include $NO_X$, CO, NMVOC and $SO_X$.

[3] As per decision 18/CMA.1, annex, para. 37, each Party shall use the 100-year time-horizon GWP values from the IPCC Fifth Assessment Report, or 100-year time-horizon GWP values from a subsequent IPCC assessment report as agreed upon by the CMA, to report aggregate emissions and removals of GHGs, expressed in $CO_2$ eq. Each Party may in addition also use other metrics (e.g.

global temperature potential) to report supplemental information on aggregate emissions and removals of GHGs, expressed in $CO_2$ eq. In such cases, the Party shall provide in the NID information on the values of the metrics used and the IPCC assessment report they were sourced from.

(4) Category 2.H. other includes pulp and paper and food and beverages industry.

(5) For reporting purposes, the signs are always negative (-) for removals and positive (+) for emissions.

(6) $CO_2$ from categories solid waste disposal on land and waste incineration should only be included if it stems from non-biogenic or inorganic waste streams. Only emissions from waste incineration without energy recovery are to be reported in the waste sector, whereas emissions from incineration with energy recovery are to be reported in the energy sector.

(7) If reporting any country-specific category under sector "6. Other", detailed explanations should be provided in Chapter 8: Other (CRT sector 6) of the national inventory document (NID).

(8) Parties are asked to report emissions from international aviation and international navigation and multilateral operations, as well as $CO_2$ emissions from biomass and $CO_2$ captured, under memo items. These emissions should not be included in the national total emissions from the energy sector. Amounts of biomass used as fuel are included in the national energy consumption but the corresponding $CO_2$ emissions are not included in the national total as it is assumed that the biomass is produced in a sustainable manner. If the biomass is harvested at an unsustainable rate, net $CO_2$ emissions are accounted for as a loss of biomass stocks in the Land Use, Land-use Change and Forestry sector.

**Note**: Minimum level of aggregation is needed to protect confidential business and military information, where it would identify particular entity's/entities' confidential data.

## TABLE 4 - SUMMARY REPORT FOR CO2 EQUIVALENT EMISSIONS

2022
VAT-CRT-2024-V0.2
Holy See

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | $CO_2$ (1) | $CH_4$ | $N_2O$ | HFCs | PFCs | Unspecified mix of HFCs and PFCs | $SF_6$ | $NF_3$ | Total |
|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ equivalents (kt) (2) | | | | | | | | |
| **Total (net emissions) (1)** | **14,60** | **0,03** | **0,08** | **1,18** | **NA,NO** | **NO** | **NO** | **NO** | **15,89** |
| **1. Energy** | **14,60** | **0,03** | **0,08** | | | | | | **14,71** |
| 1.A. Fuel combustion | 14,60 | 0,03 | 0,08 | | | | | | 14,71 |
| 1.A.1. Energy industries | NO | NO | NO | | | | | | NO |
| 1.A.2. Manufacturing industries and construction | NO | NO | NO | | | | | | NO |
| 1.A.3. Transport | 11,14 | 0,03 | 0,08 | | | | | | 11,25 |
| 1.A.4. Other sectors | 3,46 | 0,00 | 0,00 | | | | | | 3,46 |
| 1.A.5. Other | | | | | | | | | |
| 1.B. Fugitive emissions from fuels | NE,NO | NE,NO | NO | | | | | | NE,NO |
| 1.B.1. Solid fuels | NO | NO | NO | | | | | | NO |
| 1.B.2. Oil and natural gas and other emissions from energy production | NE,NO | NE,NO | NO | | | | | | NE,NO |
| 1.C. $CO_2$ transport and storage | | | | | | | | | |
| **2. Industrial processes and product use** | **NO** | **NO** | **NO** | **1,18** | **NO** | **NO** | **NO** | **NO** | **1,18** |
| 2.A. Mineral industry | NO | | | | | | | | NO |
| 2.B. Chemical industry | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| 2.C. Metal industry | NO | NO | | NO | NO | NO | NO | NO | NO |
| 2.D. Non-energy products from fuels and solvent use | NO | NO | NO | | | | | | NO |
| 2.E. Electronic Industry | | | NO | NO | NO | NO | NO | NO | NO |
| 2.F. Product uses as ODS substitutes | | | | 1,18 | NO | NO | NO | NO | 1,18 |
| 2.G. Other product manufacture and use | | | NO | NO | NO | NO | NO | NO | NO |
| 2.H. Other | | | | NO | NO | NO | NO | NO | NO |
| **3. Agriculture** | **NO** | **NA,NO** | **NA,NO** | | | | | | **NA,NO** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3.A. Enteric fermentation | | NO | | | | | | | NO |
| 3.B. Manure management | | NO | NA,NO | | | | | | NA,NO |
| 3.C. Rice cultivation | | NO | | | | | | | NO |
| 3.D. Agricultural soils | | | NO | | | | | | NO |
| 3.E. Prescribed burning of savannahs | | | | | | | | | |
| 3.F. Field burning of agricultural residues | | NA | NA | | | | | | NA |
| 3.G. Liming | NO | | | | | | | | NO |
| 3.H. Urea application | NO | | | | | | | | NO |
| 3.I. Other carbon-containing fertilizers | NO | | | | | | | | NO |
| 3.J. Other | | | | | | | | | |
| **4. Land use, land-use change and forestry** [1] | **NE,NO** | **NO** | **NA,NO** | | | | | | **NA,NE,NO** |
| 4.A. Forest land | NE,NO | NO | NO | | | | | | NE,NO |
| 4.B. Cropland | | | | | | | | | |
| 4.C. Grassland | | | | | | | | | |
| 4.D. Wetlands | | | | | | | | | |
| 4.E. Settlements | | | NA,NO | | | | | | NA,NO |
| 4.F. Other land | | | | | | | | | |
| 4.G. Harvested wood products | | | | | | | | | |
| 4.H. Other | | | | | | | | | |
| **5. Waste** | **NO** | **NA,NO** | **NO** | | | | | | **NA,NO** |
| 5.A. Solid waste disposal | | NA | | | | | | | NA |
| 5.B. Biological treatment of solid waste | | NO | NO | | | | | | NO |
| 5.C. Incineration and open burning of waste | NO | NO | NO | | | | | | NO |
| 5.D. Waste water treatment and discharge | | NO | NO | | | | | | NO |
| 5.E. Other | | | | | | | | | |
| **6. Other** *(as specified in summary 1)* | **NA** | **NA** | **NA** | **NA** | **NA** | **NO** | **NO** | **NO** | **NA,NO** |

| Memo items: [3] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1.D.1. International bunkers** | NO | NO | NO | | | | | | NO |
| 1.D.1.a. Aviation | NO | NO | NO | | | | | | NO |
| 1.D.1.b. Navigation | NO | NO | NO | | | | | | NO |
| **1.D.2. Multilateral operations** | | | | | | | | | |
| **1.D.3. $CO_2$ emissions from biomass** | 0,36 | | | | | | | | 0,36 |
| **1.D.4. $CO_2$ captured** | | | | | | | | | |
| **5.F.1. Long-term storage of C in waste disposal sites** | NO | | | | | | | | NO |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |

| **Indirect $CO_2$** [4] | NA,NO | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| **Total $CO_2$ equivalent emissions without LULUCF** | **15,89** |
| **Total CO2 equivalent emissions with LULUCF** | **15,89** |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without LULUCF** | **15,89** |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with LULUCF** | **15,89** |

[1] For $CO_2$ from LULUCF, the net emissions/removals are to be reported. For reporting purposes, the signs are always negative (-) for removals and positive (+) for emissions .

[2] As per decision 18/CMA.1, annex, para. 37, each Party shall use the 100-year time-horizon GWP values from the IPCC Fifth Assessment Report, or 100-year time-horizon GWP values from a subsequent IPCC assessment report as agreed upon by the CMA, to report aggregate emissions and removals of GHGs, expressed in $CO_2$ eq. Each Party may in addition also use other metrics (e.g. global temperature potential) to report supplemental information on aggregate emissions and removals of GHGs, expressed in $CO_2$ eq. In such cases, the Party shall provide in the national inventory document information on the values of the metrics used and the IPCC assessment report they were sourced from.

[3] Parties are asked to report emissions from international aviation and international navigation and multilateral operations, as well as $CO_2$ emissions from biomass and $CO_2$ captured, under memo items. These emissions should not be included in the national total emissions from the energy sector. Amounts of biomass used as fuel are included in the national energy consumption but the corresponding $CO_2$ emissions are not included in the national total as it is assumed that the biomass is produced in a sustainable manner. If the biomass is harvested at an unsustainable rate, net $CO_2$ emissions are accounted for as a loss of biomass stocks in the Land Use, Land-use Change and Forestry sector.

[4] In accordance with the modalities, procedures and guidelines (chapter II), for Parties that decide to report indirect $CO_2$, the national totals shall be provided with and without indirect $CO_2$.

**Note**: Minimum level of aggregation is needed to protect confidential business and military information, where it would identify particular entity's/entities' confidential data.

## CHAPTER THREE

## Measures adopted or planned for the implementation of the Convention

The policies and measures adopted by the VCS to mitigate climate change are guided by the commitments undertaken at the international level and in accordance with the principles and guidelines laid out in in the Encyclical Letter *Laudato si'* and the Apostolic Exhortation *Laudate Deum* of Pope Francis, as well as in the Social Doctrine of the Church.

The VCS submitted the *Nationally Determined Contributions* on 31 May 2023, expressing the intention to reduce greenhouse gas emissions by 20% by 2030, compared to the values recorded in 2011. That goal will be achieved through the adoption of various measures over the next years.

The environmental policies implemented within the territory of the VCS are aimed to reduce energy consumption, optimize the management of water resources, reduce emissions of substances harmful to the atmospheric ozone layer or that contribute to global warming, and manage waste production in a sustainable way, while also encouraging recovery and recycling.

The teachings of the Social Doctrine of the Church on the *care for creation* and on *integral ecology* guide the jurisdiction in developing projects aimed at fulfilling its international commitments.

Even before the ratification of the UNFCCC and the Paris Agreement (2022), the Directorate of Infrastructure and Services (DIS) of the Governorate of the VCS undertook a series of initiatives for the adaptation and upgrading of its technological systems, which include:

- the construction of *photovoltaic systems* on the roof of the Paul VI Hall (*2008*), the Vatican Museums and the Central Warehouse;
- the construction of a *solar-cooling system* to serve the cafeteria (*2009*);
- the construction of a *new district heating plant with high-efficiency* generation units and optimization of production and heat exchange systems (*2010*);
- the gradual *replacement of refrigeration units* that used non-ecological gases, with new, more energy-efficient units (*2012-2020*);
- the *upgrading of thermal power plants and substations* and related thermoregulation systems in order to achieve better performance in terms of energy efficiency (reduction of methane gas and electricity consumption) and the reduction of polluting emissions into the atmosphere (*2012-2020*);
- the retrofitting and/or replacement of direct expansion *air conditioning systems* with systems that have a *lower environmental impact* and are less energy-intensive *(2010-2025)*;
- the installation of *ventilation systems* with heat recovery;
- the *importation of electricity* produced from *renewable sources*, with the percentage of such energies progressively increasing over the last few years and into the coming years;
- the diversification and supply of less polluting or alternative energy products for transport; use of electrically powered service cars; gradual replacement of the car fleet with *electric or hybrid cars*, maintenance of the vehicle fleet in order to reduce consumption and, more generally, to decrease the impact on the environment through validated and certified disposal, *recovery and scrapping operations*;
- the *improvement of waste disposal*, as mentioned in the following section.

**1 – Waste**

Since the VCS does not have waste disposal plants in its territory, waste is sent to disposal or recycling plants or storage centers in Italy. Nonetheless, the VCS aims at adopting standards used by the most environmentally-friendly countries in the world. It also strives towards high percentages of separate waste collection.

In the jurisdiction, waste management is subject to the rules established in the Decree No. CCCXVII *on the Regulations for the management of municipal solid waste and the Regulations for the application of the contribution for the management of urban waste*, of 9 July 2019.

The management of municipal waste seeks to reduce waste production, separating the flows of the different types of materials that compose it and reducing over time the quantity of non-recyclable and non-recoverable unsorted material.

The ultimate goal of waste management is to promote recovery, reuse and non-waste. For this reason, alternatives for the management of municipal waste, treating it and transforming it into energy with low environmental impact systems, are being examined, as well as the possibility of transforming hospital waste into inert material useful for combustion.

The overall system for the collection, transport and disposal of urban and similar waste is organized to ensure the reuse, recycling, composting or disposal of waste. Specifically, it seeks to:

*a)* reduce the flow of waste to be disposed of;
*b)* promote the recovery of residues from the production, distribution, consumption and collection phases;
*c)* improve the technological processes of waste recovery and disposal plants, in order to reduce energy consumption and emissions;
*d)* reduce the quantity and hazardousness of non-recoverable fractions to be sent for final disposal, ensuring greater guarantees of environmental protection;
*e)* promote the recovery of materials and energy even in the final disposal phase.

Waste collection, transport and disposal services are carried out taking into account:

*a)* the qualitative and quantitative characteristics of the waste;
*b)* the variations in the characteristics of the waste in relation to the seasons and climate;
*c)* the system of production, distribution and consumption of goods;
*d)* recovery systems;
*e)* final disposal systems;
*f)* the structure and urban typology of the collection basin;
*g)* interactions with the various production activities present in the collection basin;
*h)* the commodity evolution of waste due to the evolution of consumption.

In 2019, the sale of single-use plastic was banned by the Administration. For this reason, the distribution of PET (Polyethylene Terephthalate) bottle compactors in various points of the State has been planned, to encourage the recovery and recycling of this type of reusable plastic.

Incentives have been provided for the separate collection of urban waste. The VCS has seen an increase *from 42% waste-differentiation in 2016 to 65% in 2020*.

Other activities implemented to make waste management more effective include:

- paying particular attention to the recovery and recycling of paper and cardboard, which represent the primary goods with a high environmental impact if not managed correctly;
- the recovery of used oils of vegetable origin which are reused for the production of biodiesel and consequently not dispersed in the environment;
- differentiation of special waste equal to 99%, allowing 90% of it to be sent for recovery with a consequent economic return, thus increasing the value of waste as a resource;
- recovering waste materials from the maintenance of green areas and organic waste from kitchens, transforming it into quality compost.

The collection systems for the different fractions of urban and similar waste are divided, according to the methods of delivery, into the following categories:

1) Separate roadside waste collection service, by placing bins on the street throughout the territory of the State, where users are obliged to collect the different types of waste separately for the correct disposal of each;
2) Door-to-door collection service: the method consists of placing special containers in places identified in the territory. The containers are displayed, by the user, on the roadway indicating the times established for collection. The containers are kept in private spaces and placed on the street only in conjunction with the passage of collection vehicles;
3) Collection service at the *Ecocenter* consisting of a staffed and supplied area in which there are special *containers* for each type of waste.

Each portion of municipal waste and similar waste collected, whether it is intended for reuse, recovery, recycling, composting, special forms of disposal or disposal in controlled landfills or waste-to-energy plants or devolved for simple disposal, is carried to the appropriate recipient, by personnel duly authorized to receive the material and carry out the operations related to it.

The removal of waste is done using vehicles whose characteristics, state of conservation and maintenance comply with health and hygiene requirements. The methods for weighing the collected municipal waste are determined to guarantee the correct and objective measurement of the quantities collected, whether they are intended for recovery or disposal. The various types of waste are weighted at the Customs and Goods Transit Services of the Governorate.

During removal from the territory, carried out by companies registered in the National Register of Environmental Managers of the Italian Republic, the waste is furnished with an identification form indicating the name and address of the producer and holder, the origin and the type.

## 2 – Water

Today, water is at the center of a challenge that is made even more difficult by climate change, which modifies the hydrological cycle with strong impacts on the quality and quantity of water resources and with a consequent increase in the risks associated with it.

Particularly significant climatic stress in the Vatican derives from the reduction in rainfall, especially in the summer. This phenomenon will lead to more frequent drought and water scarcity as well as increased competition between the demand for drinking water for urban and agricultural uses, and to ensure the functioning of ecosystem services. This potential situation is part of the medium-high water stress that already exists in the Italian peninsula and which undoubtedly will have an impact on Vatican territory.

To limit those effects, policies are being developed to reduce the risk of water scarcity by looking both at mitigation and adaptation to drought events, and by improving the capacity and/or adequacy of the infrastructure.

Recent studies indicate that in the period 2021-2050, there will be an increase in temperature of up to 2°C in the Italian peninsula on a seasonal scale, with a generalized decrease in rainfall during the summer period. Those projections apply to the VCS territory due to its geographical position.

Over the last few years, the Governorate of the VCS has undertaken a series of measures to adapt and optimize the use of water resources, including:

- the construction of circuits providing a system of recirculation for the fountains located within the State (projects already carried out: St. Peter's Square fountains, St. Joseph fountain and *Galea fountain*);
- the elimination of closed condensation circuits of water-cooled refrigeration units at the *Palazzo della Tipografia*, the Radio Receiver and at the *Belvedere Palace*;
- the construction of closed condensing circuits of water-cooled refrigeration units in the Paul VI Hall;
- the separation of the irrigation water network from the fire-fighting water network in order to rationalize the two uses, both in terms of energy expenditure and operational functionality;
- the redevelopment of water supplies and drinking water tanks serving the VCS with a view, in particular, to minimize the use of pumping stations;
- the development of new watering systems for the gardens with reduced water consumption.

## CHAPTER FOUR

## Other information relevant for the achievement of the objectives of the Convention

Climate crisis is a threat to integral human development that must be addressed through a combination of global governance and a change in lifestyle.

According to Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC), "*the ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*".

In order to achieve this objective, it is important not to "*be limited solely to the economic and technological dimension: technical solutions are necessary but they are not enough; it is essential and proper to take into careful consideration also the ethical and social aspects of the new paradigm of development and progress.*

*Here we enter into the fundamental fields of education and the promotion of lifestyles that favour sustainable models of production and consumption*[12]*; and we are reminded of the need to promote the growth of a responsible awareness of our Common Home*[13]"[14].

Art. 6 of the UNFCCC states that Parties shall promote and facilitate "*the development and implementation of educational and public awareness programmes on climate change and its effects, public access to information on climate change and its effects, public participation in addressing climate change and its effects and developing adequate responses, training of scientific, technical and managerial personnel*".

All of these activities are essential not only to effectively tackle climate change, but also to foster lasting peace, "*in the midst of a world that is in flames, as a result of both global warming and armed conflicts*"[15].

World peace is threatened not only by the arms race, by regional conflicts and by the injustices that still exist among peoples and nations, but also by the lack of due respect for nature, the disorderly exploitation of its resources and the progressive deterioration of the quality of life, linked also to environmental and social degradation, of which the climate crisis is a clear and worrying symptom.

Regrettably, we have to admit that "*our responses [to climate challenges] have not been adequate, while the world in which we live is collapsing and may be nearing the breaking point*"[16].

The whole of society "*ought to exercise a healthy 'pressure', since every family ought to realize that the future of their children is at stake*"[17]. For this reason, a broader vision under the banner of "*responsibility for the legacy we will leave behind, once we pass from this world*"[18] is needed.

"*Now is the time to follow words with deeds. «Living our vocation to be protectors of God's handiwork is essential to a life of virtue; it is not an optional or a secondary aspect of our Christian*

[12] Cf. Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, n. 180.
[13] Cf. Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, nn. 202, 231.
[14] Pope Francis, *Message to the UNFCCC COP22*, 10 November 2016.
[15] Pope Leo XIV, *Homily in the Holy Mass for the Care of Creation*, Borgo Laudato si' (Castel Gandolfo), 9 July 2025.
[16] Pope Francis, Apostolic Exhortation *Laudate Deum*, 4 October 2023, n. 2.
[17] Pope Francis, Apostolic Exhortation *Laudate Deum*, 4 October 2023, n. 58.
[18] Pope Francis, Apostolic Exhortation *Laudate Deum*, 4 October 2023, n. 18.

*experience»*[19]*. By working with love and perseverance, we can sow many seeds of justice and thus contribute to the growth of peace and the renewal of hope*"[20].

Environmental protection is indeed a duty of every individual. Each person is not only a member of his or her own nation but is also a citizen of the world, so the notion of 'community' must also be understood as a 'global community'. From this perspective, the person acquires 'ecological citizenship' and all people are deemed citizens of the whole world and 'guardians' of the *Common Home*, because God has entrusted His creation to us[21]. In this 'global community', we are all brothers and sisters because we have the same Creator. "*All of us can cooperate as instruments of God for the care of creation, each according to his or her own culture, experience, involvements and talents*"[22].

Saint John Paul II noted that "*the dramatic threat of ecological breakdown is teaching us the extent to which greed and selfishness - both individual and collective - are contrary to the order of creation, an order which is characterized by mutual interdependence*"[23], and that our society will not find a solution to the ecological crisis if it does not review its way of life.

Undoubtedly, the environmental challenge is inseparable from the educational one: we need to stimulate new lifestyles, based on integral human development and sustainability, as well as fraternity[24].

For many years, the Holy See and the VCS have encouraged sustainable development through the promotion of environmental policies and *integral ecology education* aimed at safeguarding the creation. Indeed, as underlined by Pope Francis in the Encyclical Letter *Laudato si'*, the earth is wounded, and 'ecological conversion' is needed[25].

In that spirit, the VCS has made an *integral choice for sustainability*. The environmental policies aimed at improving waste and water management, as explained in the previous chapters, exemplify some of the integral ecology and climate-friendly activities undertaken by the VCS.

Those activities are designed to put into practice the calls made by the Social Doctrine of the Church[26] in favor of a personal and communitarian 'ecological conversion'.

In accordance also with Art. 6 of the UNFCCC, the VCS continues to raise awareness on these issues among its residents and employees with a view to fostering a lifestyle coherent with an integral ecology perspective. Specific aspects include focusing on waste recycling, respect for greenery, reducing water and energy consumption, utilizing renewable sources, avoiding greenhouse gases, promoting less air pollution by favoring electric modes of transport and in opting for pesticide and ecological fertilizers that respect the earth and its fruits.

The Holy See and the VCS are committed to fostering this *integral ecology educational perspective*, which is fundamental to achieve the aims of the UNFCCC and the Paris Agreement.

In line with the Social Doctrine of the Church on the care for creation, those commitments are achieved, *inter alia*, in the following ways:

- The Holy Father's teachings on integral ecology, e.g., the annual Message of His Holiness for the World Day of Prayer for the Care of Creation (1 September), as well as his numerous

[19] Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, n. 217.
[20] Pope Leo XIV, *Message for the 10th World Day of Prayer for the Care of Creation*, 1 September 2025.
[21] Cf. Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, n. 211.
[22] Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, n. 14.
[23] Saint John Paul II, *Message for the World Day of Peace, Peace with God the Creator, Peace with All of Creation*, 1 January 1990, n. 8.
[24] Cf. Pope Francis, Encyclical Letter *Laudato si'*, nn. 209-215.
[25] Cf. Pope Francis, Encyclical Letter *Laudato si'*, Chapter six.
[26] Cf., *inter alia*, Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, 29 June 2004.

statements, reflections and publications on the subject of integral ecology and care for creation.

- Integral ecology and climate change education and awareness campaigns directed to VCS residents and workers, e.g., in 2024, the first issue of the publication *"Dal cuore dello Stato il Governatorato si racconta"* ("From the Heart of the State, the Governorate tells its story"), produced by the Governorate, offered readers several practical suggestions for achieving energy savings in everyday uses, and in this way it raised awareness of integral ecology.
- Conferences, workshops and other in-depth events on integral ecology and climate change promoted by the Pontifical Academy of Sciences (PAS) and the Pontifical Academy of Social Sciences (PASS), e.g., the 2024 Plenary Session of the PAS was dedicated to "Science of Sustainability and Well Being". In recent years, the PAS has also organized various workshops, including on Climate Crisis and Climate Resilience (2024), on Indigenous Peoples' Knowledge (2024), on Food and Humanitarian Crisis (2023), on Ecosystems and Climate Stress (2022) and on the Health of the Seas and the Oceans (2022). The PASS organized, *inter alia*, workshops on Sustainable Solutions (2025), on Global Commons (2023) and on Integral and Sustainable Development (2023). All these events saw the participation of leading experts in the field.
- Activities aimed at increasing education and awareness on integral ecology and climate change for children and youth, especially in the summertime, e.g. since the summer of 2021, the Vatican Gardens were transformed into a playground and workshop area for young children, where they could learn about the importance and positive impact that small daily gestures have on God's creation, by participating, together with employees, in the education of the new generations.

## CONCLUSION

The Holy See and the Vatican City State (VCS) consider the energy transition an important aspect of the care for the creation[27].

The objectives that the VCS seeks to achieve, not only through the adoption of specific measures but also through a program of education in integral ecology and awareness of the environmental question, arise from the responsibility to care for God's creation, which he has entrusted to us.

The Holy See and the VCS intend to provide their contribution, as set forth in this first National Communication, to address this complex challenge, which is not only environmental, but also ethical, social, economic and political.

[27] Cf. Pope Francis, Encyclical Letter *Laudato si'*, 24 May 2015, nn. 164-165; Apostolic Exhortation *Laudate Deum*, 4 October 2023, nn. 55, 59.