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GHG EMISSIONS OF ALL WORLD COUNTRIES

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Contents

Abstract

The Emissions Database for Global Atmospheric Research (EDGAR) provides greenhouse gas (GHG) emissions time series for all countries and for all anthropogenic sectors from 1970 until 2022, with the exception of emissions and removals from land use and forestry, which are provided for the years 1990-2022. The report contributes to the Paris Agreement process with an independent quantitative overview of global GHG emissions, based on the IEA-EDGAR CO_2, EDGAR CH_4, EDGAR N_2O and EDGAR F-gases version 8.0 datasets (2023).

Acknowledgement

This booklet was produced with input from many colleagues, gathered over several years. The International Energy Agency (IEA) energy use statistics and the corresponding CO_2 emissions are fundamental to the EDGAR database and the authors would like to thank IEA for the long-standing collaboration. The authors are grateful to the European Commission's Directorate-General for Climate Action (DG CLIMA) (V. Pollard, B. Goni-Ros, R. Lake, J. Genet, O. Juvyns, S. Santacroce, J. Salay, S. Kay) for their reviews and guidance and M. Rivas Rabago (DG ENER) and M. Tognoni (DG ENER) for their review. The authors would also like to thank the Food and Agriculture Organisation (FAO) (F. Tubiello), United States Geological Survey (USGS) (R. Schulte, L. Apodaca, A. Hatfield), the International Fertiliser Association (IFA) (L. Cross), the World Steel Association, the Energy Institute (EI), and the Global Gas Flaring Reduction Partnership (GGFR), the Payne Institute at the Colorado School of Mines and the U.S. National Oceanic and Atmospheric Administration (NOAA), for the provision of data. An extra thank to F. Pekar (JRC, Unit C.5), Matthias Weitzel (JRC, Unit C.6) and Sabine Darras (JRC, Unit C.5) for their thorough reviews and proofreading and to Bagdagul Tan (JRC.C) for the design of the cover page.

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Executive summary

Policy context

Most countries around the world are preparing plans and implementing actions to tackle climate change. The European Union has ambitious objectives in this regard, and in the context of the European Green Deal[1] and European Climate Law[2], has set a target to reduce its net domestic greenhouse gas (GHG) emissions by at least 55% by 2030 compared to 1990 levels and to become climate neutral (net zero greenhouse gas emissions) by 2050.

On the 14th of July 2021, the European Commission proposed a package of legislative proposals (known as the "Fit for 55" package[3]) covering climate, energy, land use, transport and taxation, that will lead the EU to achieve its 2030 GHG emissions reduction target. At the time of writing, several major initiatives of the "Fit for 55" package have been adopted and are being implemented[4] and its full deployment is expected before the end of 2024.

At the global level, all G20 countries, covering in total about 75% of current global GHG emissions, have decided to fix a target date in which they will become net-zero emitters[5]. Among them, USA, Canada, Brazil, Australia and the European Union have pledged to reach climate neutrality by 2050, China and Saudi Arabia by 2060 (while India targets net zero emissions by 2070).

All Parties to the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) are required to prepare emission reduction pledges, known as Nationally Determined Contributions (NDCs). Under the transparency framework of the Paris Agreement, all Parties must report bottom-up inventories of national greenhouse gas emissions and track progress towards the implementation and achievement of their NDCs. This reporting is to be contained in Biennial Transparency Reports (BTRs), which are first due by the end of 2024. Parties may submit their inventory reports as part of the BTR or separately, and Annex-I[6] countries must continue submitting inventories annually.

Bottom-up national emission inventories are therefore an essential component of reporting and tracking progress towards the goals of the Paris Agreement. However, national inventory reports are not yet available for all countries and years. In addition, they are dependent on individual national reporting processes and methodological choices, they can present data gaps for specific sectors and currently, except for Annex I parties, there is no obligation to include long-term series of emissions up to the most recent year.

The European Commission's in-house Emissions Database for Global Atmospheric Research (EDGAR)[7] offers an alternative to overcome these limitations and to complement national inventories and has the advantage of producing timely emission estimates that are comparable across countries.

EDGAR relies on several sources of international statistics for the underpinning data. Foremost among these is the International Energy Agency (IEA). To harmonise global GHG emission estimates, this booklet incorporates IEA CO_2 emissions from fossil fuel combustion sources named IEA-EDGAR CO_2 emission dataset (v2), which are complemented with in-house EDGAR estimates for CH_4, N_2O and F-gas emissions.

EDGAR completes the global picture with emissions time-series for each country, contributing to enhanced transparency and providing an additional source with which national and global estimates can be compared.

This report focuses on the update to the most recent years of the GHG emission time series, including emissions from anthropogenic sectors and Land Use, Land Use Change and Forestry (LULUCF) up to 2022. For all countries,

(1) See the Communication from the European Commission on the European Green Deal: COM(2019) 640 final.

(2) Regulation (EU) 2021/1119, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119

(3) https://ec.europa.eu/clima/eu-action/european-green-deal/delivering-european-green-deal_en

(4) https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal/fit-55-delivering-proposals_en

(5) https://www.un.org/en/climatechange/net-zero-coalition

(6) Annex I Parties comprise the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

(7) EDGAR (Emissions Database for Global Atmospheric Research) Community GHG Database, a collaboration between the European Commission, Joint Research Centre (JRC), the International Energy Agency (IEA), and comprising IEA-EDGAR CO_2, EDGAR CH_4, EDGAR N_2O, EDGAR F-GASES version v8.0 (2023), European Commission, https://edgar.jrc.ec.europa.eu/report_2023.

including the EU and its 27 Member States[8], EDGAR emissions may differ from official national inventories due to differences in data sources, methodologies, and approaches, although both are, in principle, based on the Intergovernmental Panel on Climate Change (IPCC) guidelines for GHG reporting. However, the overall EU GHG emissions trend is similar to that reported to the UNFCCC even though the figures do not match completely.

Key conclusions

According to the latest data, global GHG emissions in 2022 reached 53.8 Gt CO_{2eq} (without LULUCF)[9]. The 2022 data represent the highest level recorded and experienced an increase of 1.4% or 730 Mt CO_{2eq} compared to the levels in 2021. This upward trend indicates a continuation of the post-COVID rebound. In fact, global GHG emissions in 2022 rose by 6.2% compared to the levels in 2020, and by 2.3% compared to the levels in 2019.

Taking a longer-term perspective and considering the top five emitters in 2022, the European Union's GHG emissions demonstrated the most significant relative decrease among the top emitting economies, being 27.0% lower in 2022 than in 1990 and showing GHG emission decoupling from economic growth.

Over the same period, Russia's GHG emissions also saw a considerable decrease of 15.5%, while the United States' emissions decreased only by 2.4%. On the contrary, emerging economies such as China and India have experienced considerable increases in their GHG emissions. In fact, emerging countries even within the top emitting economies, still have to reach a peak in their GHG emissions, decouple them from their economic growth, and then move forward to the achievement of their climate neutrality commitments. China's GHG emissions have increased by 285%, while India's GHG emissions have increased by 170% from 1990 to 2022.

Globally, LULUCF has acted as a fairly stable net sink for CO_2 emissions since 2000, if the contribution of wildfire related GHG emissions is excluded. In 2022, we estimate that this sector was a net sink of about 0.18 Gt CO_{2eq} (or 1.35 Gt CO_2 excluding wildfires) equivalent to 0.33% of global GHG emissions of that year.

Global deforestation was responsible for net CO_2 emissions of about 4.0 Gt CO_2 in 2022, equivalent to 10.4% (or 7.5%) of the total anthropogenic CO_2 (or GHG) emissions. In the EU27, LULUCF in 2022 was a net sink of 0.21 Gt CO_{2eq} (or 0.22 Gt CO_{2eq} when excluding wildfires), which is approximately 40% less than in 1990.

Main findings

Since the beginning of the 21st century, global GHG emissions have grown steadily in comparison to the two previous decades, mainly due to the increase in fossil CO_2 emissions by China, India, and other emerging economies. However, the global economy experienced a slowdown in 2020 due to the COVID-19 crisis. As a result, there was a temporary halt in the growth of global greenhouse gas (GHG) emissions, followed by a rebound in 2021[10]. Based on the emission estimates for 2022 provided by EDGAR, global GHG emissions increased by 1.4% compared to 2021, reaching 53.8 Gt CO_{2eq}. These figures are 2.3% higher than the 52.6 Gt CO_{2eq} emissions recorded in 2019.

In 2022, the majority of GHG emissions consisted of fossil CO_2 accounting for 71.6% of total emissions, while CH_4 contributed by 21% to the total, N_2O by 4.8% and F-gases by 2.6%. Global fossil CO_2 emissions increased by more than 70% since 1990. The increases in CH_4 and N_2O emissions have followed a somewhat slower pace: CH_4 increased by 32.4% and N_2O by 36.5% between 1990 and 2022, while F-gases have seen a four-fold increase in the same period.

China, the United States, India, the EU27, Russia and Brazil were the six world largest GHG emitters in 2022 (see Figure 1). Together they account for 50.1% of global population, 61.2% of global Gross Domestic Product (WB, 2023), 63.4% of global fossil fuel consumption (EI, 2023[11]) and 61.6% of global GHG emissions.

Among these top emitters, in 2022 China, the United States and India increased their emissions compared to 2021, with India having the largest increase in relative terms (5%). In 2022, the EU27's GHG emissions were 27.0% lower than in 1990 at 3.59 Gt CO_{2eq} and 0.8% lower than in 2021, representing 6.7% of global emissions. Out of the countries that contribute more than 1% to the total global greenhouse gas emissions (see Table 1), only Australia

(8) Hereafter EU27

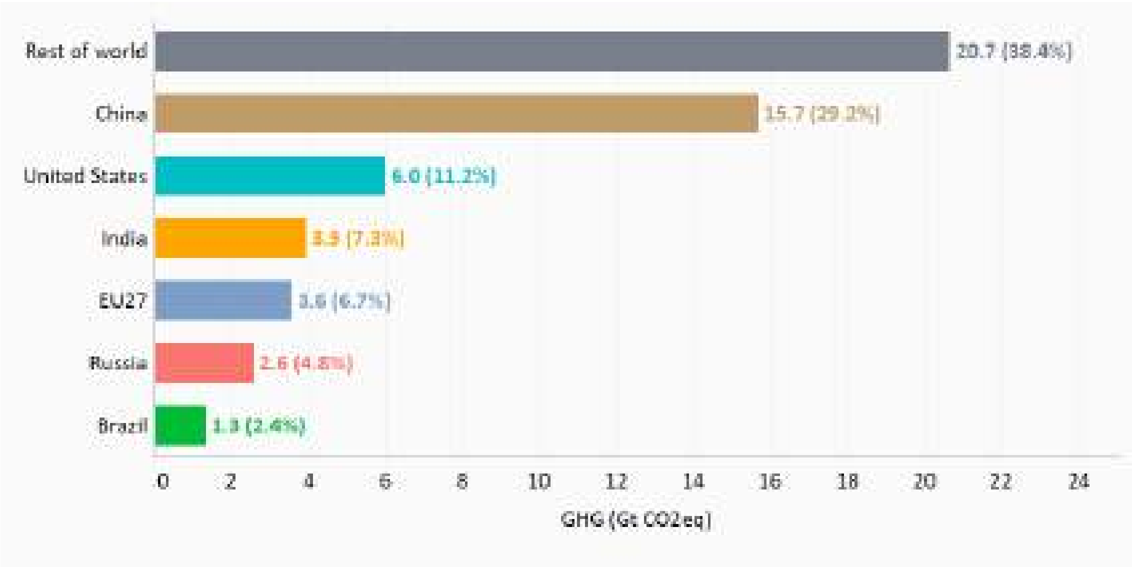
(9) The analysis on GHG emissions trends presented does not include the emissions from LULUCF. Hereafter, these emissions will be defined as GHG emissions.

(10) The comparison between the 2022 emission levels with the years 2019, 2020 and 2021 is presented across the text to evaluate how current emissions (2022) have changed compared to the pre COVID-19 pandemic (2019), the year of the pandemic (2020) and the previous year (2021) which is also characterised by the emission rebound from the COVID-19 reduction.

(11) Defined as the sum of all coal, liquid fossil fuels and natural gas primary energy consumption.

managed to reduce its emissions in 2021 (by 1.9%) and 2022 (by 0.3%) compared to 2020. Additionally, Australia's emission intensity (emissions per unit of economic output) has consistently decreased over the past decade, although its per capita emissions are even higher than the US or Russian ones. Conversely, Indonesia displayed the largest increase of 10% in GHG emissions in 2022 compared to 2021.

Figure 1. GHG emissions (in Gt CO_{2eq}) and contribution of the major emitting economies and the rest of the world in 2022, (in Gt CO_{2eq})



Source: JRC, 2023

Table 1. Shares in 2022 global emissions[12], yearly GHG emission relative changes[13] over the period 2019-2022 and the CAGR[14] in 1990-2022 (%)

	Share in global	Change 2019-2020	Change 2020-2021	Change 2021-2022	Change 2019-2022	Change 2020-2022	CAGR (1990-2022)
China	29.2%	1.9%	5.1%	0.3%	7.4%	5.4%	4.3%
United States	11.2%	-8.7%	5.5%	1.6%	-2.2%	7.2%	-0.1%
India	7.3%	-5.7%	6.7%	5.0%	5.7%	12.1%	3.2%
EU27	6.7%	-7.7%	5.6%	-0.8%	-3.4%	4.7%	-1.0%
Russia	4.8%	-3.9%	7.2%	-1.0%	2.0%	6.1%	-0.5%
Brazil	2.4%	-0.3%	5.1%	-2.4%	2.3%	2.6%	2.0%
Indonesia	2.3%	-4.9%	2.1%	10.0%	6.8%	12.3%	3.4%
Japan	2.2%	-5.3%	1.2%	0.6%	-3.6%	1.8%	-0.3%
Iran	1.8%	-1.6%	3.9%	1.6%	3.9%	5.6%	3.3%
Mexico	1.5%	-6.5%	3.5%	7.1%	3.7%	10.9%	1.8%
Saudi Arabia	1.5%	-0.8%	3.3%	3.9%	6.4%	7.3%	3.9%
Canada	1.4%	-8.2%	3.0%	3.2%	-2.4%	6.4%	0.8%
South Korea	1.3%	-4.3%	4.5%	-0.7%	-0.8%	3.7%	2.5%
Türkiye	1.3%	3.5%	8.5%	3.1%	15.8%	11.9%	3.5%
Australia	1.1%	-3.9%	-2.0%	1.7%	-4.1%	-0.3%	0.7%
South Africa	0.99%	-9.8%	-0.5%	-2.5%	-12.5%	-3.1%	0.8%
Global		-3.7%	4.8%	1.4%	2.3%	6.2%	1.5%
International Aviation	0.8%	-52.3%	15.4%	23.3%	-32.1%	42.3%	1.5%
International Shipping	1.4%	-8.5%	5.7%	5.7%	2.2%	11.7%	2.0%

Source: JRC, 2023

([12]) In Table 1, countries are ranked by their GHG emission share in the global total (countries with share of more than 1% are shown, together with international shipping and aviation).

([13]) It is important to acknowledge that year-to-year variations in emissions are estimated with an accuracy level of approximately ±0.5% (Olivier et al., 2016) when relying on robust statistical activity data (such as IEA energy balance data or CO_2 emissions from fossil fuel combustion for the period 1970-2020). For the data spanning 2021-2022, the accuracy can range up to ±2% (based on a Fast-Track approach), contingent upon regional, sectoral, and fuel-specific contributions. Emission magnitudes, on the other hand, have a range of accuracy that depends on the level of aggregation (for example global or country level, total emission, or specific sector, as detailed by Solazzo et al., 2021), as well as the substance, with N_2O in particular having higher levels of uncertainty, and CO_2 the least. Global total GHG emissions are estimated with around ±10% accuracy, while the range of accuracy for country level total CO_2 emissions is between ±4% and ±35% (95% confidence interval). Policy makers and the scientific community should consider these uncertainties when using these data for further analysis.

([14]) Compound annual growth rate (CAGR) calculates annual changes over a specified number of years as if this change had happened steadily each year over that time period.

Emissions from international aviation and shipping, which represented 0.8% and 1.4% of global GHG emissions in 2022, increased by 23.3% and 5.7%, respectively. Emissions from international aviation decreased by almost half in 2020, partially rebounding in 2021 when they accounted for 55% of the 2019 value.

Concerning international shipping, the increase in GHG emissions was more than twice their 2020 reduction (in relative terms), with emissions in 2022 being 2.2% higher than in 2019.

Quick guide

The main sections of this booklet present an overview of the global and regional trends of GHG emissions. A brief and representative analysis shows the role of top emitters (by country and sector) in the evolution of emissions over a 52-year period. Section 3 is devoted to preliminary estimation of LULUCF CO_2 emissions and removals, and GHG emissions from wildfires. Then, for each country, a fact sheet is provided with time series of GHG emissions from all anthropogenic activities except land use, land-use change, forestry, and large-scale biomass burning which are provided in Annex 7 for world macro-regions.

1 Introduction

Scope

In December 2015, the Paris Agreement brought together 195 nations to undertake ambitious efforts to combat climate change and required all parties to the agreement to put forward their best efforts through "nationally determined contributions" (NDC). Acknowledging the need to ensure environmental integrity, an enhanced transparency framework was created and 5-yearly Global Stocktakes were planned from 2023 onwards. It is nevertheless worth noticing that current NDCs commitments by world countries for 2030 have been judged "highly insufficient" by the latest UNEP emission Gap report (UNEP, 2022).

The Emissions Database for Global Atmospheric Research (EDGAR) contributes to global climate action with an independent and quantitative view of global GHG emissions. EDGAR is a global database that provides estimates of country and sector-specific GHG emissions (CO_2, CH_4, N_2O and F-gases) implementing a transparent state-of-the-art methodology (Janssens-Maenhout et al., 2019; IPCC, 2006a; IPCC 2019b). As such, it supports efforts to provide consistent and transparent emission estimates that are global in scope and can inform climate action under the Paris Agreement, although the conception and early versions of EDGAR precede by far the Paris Agreement.

EDGAR estimates of greenhouse gas emissions use global statistics and state-of-the-art scientific knowledge of emission mechanisms for a wide range of anthropogenic activities. The methodology used is transparent and in line with the most recent scientific literature and Intergovernmental Panel on Climate Change (IPCC) guidelines (IPCC, 2006a; IPCC, 2019b). The EDGAR Community GHG emission database used in this report comprises IEA-EDGAR CO_2[15], EDGAR CH_4, EDGAR N_2O and EDGAR F-gases version 8.0. This edition of the booklet also includes annual macro-regional estimates of CO_2 emissions from Land Use, Land Use Change and Forestry (LULUCF) sector from 1990 to 2022, including GHG emissions from wildfires from the Global Wildfire Information System (GWIS)[16], as part of the continuous improvement and expanding outreach of the EDGAR database.

A combination of reliability, independence, transparency and completeness makes EDGAR a valuable quantitative tool to support the complex international scientific and political discussions on climate mitigation. EDGAR data can contribute to providing the comprehensive picture needed for the UNFCCC's Global Stocktakes envisaged from 2023 onwards. Previous editions of this booklet have been regularly presented to the annual Conference of Parties (COP) under UNFCCC.

Overview

This booklet presents the trends of global GHG emissions from 1990 to 2022 together with emissions and removals from LULUCF and wildfires. EDGAR applies a bottom-up methodology a summary of which is available in the Annex 1 of this booklet, together with data sources and references. For each country as well as for the world and EU27 emissions, a fact-sheet with time series of GHG reveals sector-specific trends and trends in emissions per capita and per GDP. The upper panel of the fact sheet includes emissions from 1990 until 2022 by aggregated sectors, together with a pie chart indicating the relative share of each GHG to the country total in 2022. An overview table with total emissions by country for the years 1990, 2005 (Kyoto protocol), 2015 (Paris Agreement) and 2022 is also reported, together with per capita and per GDP emissions and population data. Finally, the bottom panel of each fact-sheet shows the changes of emissions by sector for the last available year (2022) compared to 1990, 2005 and 2021. All data presented in this booklet are available for download and further analysis from the EDGAR website *https://edgar.jrc.ec.europa.eu/report_2023*.

Related and future JRC work

The reliability, independence and completeness of the EDGAR GHG emission estimates make them a valuable quantitative information source in support of the complex international scientific and political discussions on climate mitigation. The EDGAR database compiles global GHG emissions, making use of international statistics and

(15) IEA-EDGAR CO_2 dataset incorporates IEA CO_2 emissions from fossil fuel combustion (1970-2020), extended up to 2022 with a Fast-Track (FT) methodology and JRC computed CO_2 process emissions (1970-2022), as described in Annex 1.
(16) https://gwis.jrc.ec.europa.eu/

a globally consistent methodology across countries, complementing official national inventories reported by the EU Member States to the European Environmental Agency and by Parties to the UNFCCC[17].

The EDGAR database aims to inform policy makers and the scientific community involved in the field of GHG emissions and budgets. It complements and supports the upcoming UNFCCC Global Stocktakes foreseen under the Paris Agreement. It also underpins analyses of the co-benefits of air pollution and GHG emission mitigation strategies, supports the development of an independent verification system and helps the understanding of emission uncertainties.

EDGAR depends on a number of sources of international statistics for the underlying data. Foremost among these is the International Energy Agency (IEA). The IEA and the JRC are committed to the yearly co-production of consistent fossil CO_2 emissions estimates up to the year *t-1*, directly using IEA CO_2 emissions from fossil fuel combustion (up to *t-2* extended by the JRC with a Fast-Track approach) and JRC computations of CO_2 process emissions.

This booklet incorporates emissions from IEA-EDGAR CO_2 (v2), EDGAR CH_4, EDGAR N_2O and EDGAR F-gases version 8.0 (2023). Land Use, Land Use Change and Forestry (LULUCF) emissions are based on an updated version of the EDGAR-LULUCF database and the Global Wildfire Information System (GWIS).

In addition, the EDGAR framework and the JRC experience in compiling emissions inventories are shared and compared within the international emissions community of the Global Emissions InitiAtive (GEIA) where EDGAR is represented in the Scientific Steering Committee.

EDGAR GHG emissions presented in the yearly EDGAR booklets also contributed to the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) Working Group III on climate mitigation (Dhakal et al., 2022), and are regularly used in the yearly UNEP Emission Gap Reports.

EDGAR supports the IPCC Task Force on National Greenhouse Gas Inventories, compiling and refining guidelines for national GHG emission inventories and providing training support and knowledge databases to visualise emission hot spots. EDGAR supports the Arctic Monitoring and Assessment Programme (AMAP) of the Arctic Council by providing methane (CH_4), Persistent Organic Pollutant (POPs) and mercury (Hg) emission data. Finally, EDGAR air pollutant emission estimates contribute to the United Nations Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the Task Force on Hemispheric Transport of Air Pollution (TF-HTAP) with the compilation of global air pollutant emission mosaics[18] (Crippa et al., 2023) and to global atmospheric modelling activities to enhance the scientific understanding of the intercontinental transport of air pollution and related impacts.

Future developments of EDGAR will include the extension of historical and up to date emissions with projections under different climate scenarios, and the development of high spatial resolution emissions in support of sub-national climate territorial policies. Moreover, starting from the EDGAR-FOOD work[19], EDGAR will further provide tools and data to move from a sector-based approach to a system perspective.

Thanks to their transparency and completeness EDGAR data are also being used by an ever-increasing pool of researchers, policy makers and engaged citizens as a reliable source of information on climate-relevant emissions.

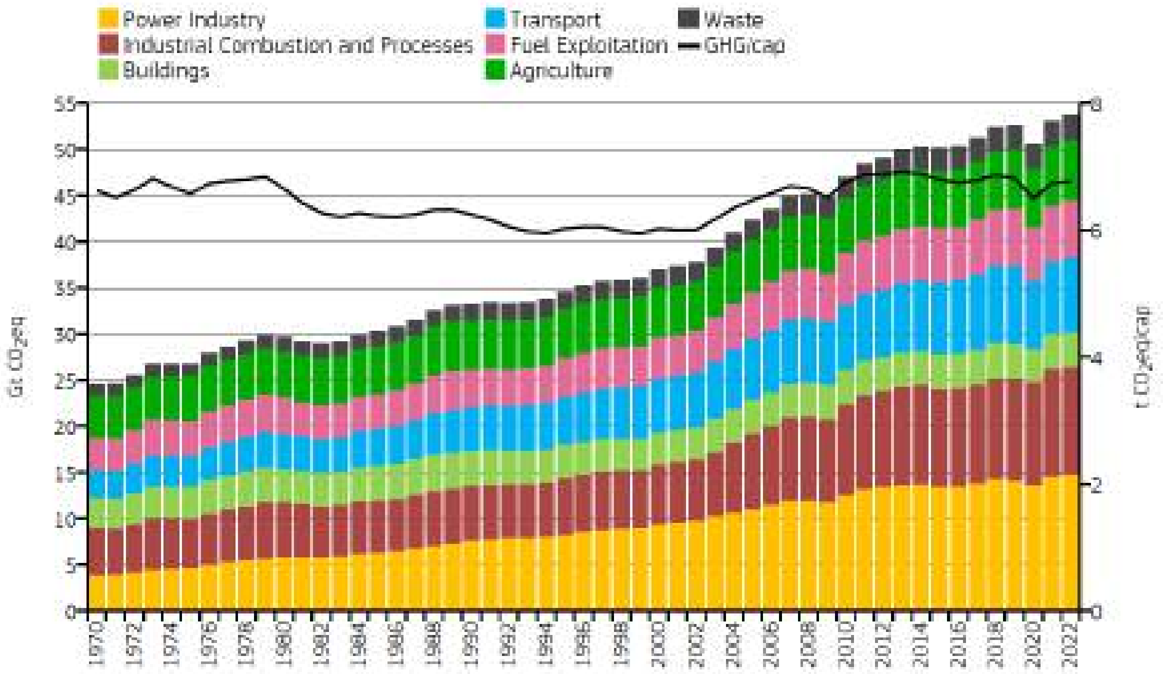
([17]) Whenever available, officially reported data, used for tracking progress towards policy targets and for a number of countries or regions, normally provide a more robust and complete picture than the data available under EDGAR. For the EU, for example, the national inventory data is more complete/accurate and should be used as the basis for assessing EU climate progress.

([18]) https://edgar.jrc.ec.europa.eu/dataset_htap_v3
([19]) https://edgar.jrc.ec.europa.eu/edgar_food

2 Global GHG emissions from 1970 until 2022

The evolution of global GHG emissions over the period 1970-2022 is illustrated in Figure 2. Emission trends for the main activity sectors (namely power industry[20], industrial combustion and processes[21], transport[22], buildings[23], agriculture[24], waste[25] and fuel exploitation[26]) are also shown. Because of the COVID-19 pandemic, global emissions decreased by 3.7% in 2020 compared to 2019 levels, interrupting a more than ten-year increasing trend. Global GHG emissions started to grow after the COVID-19 pandemic, reaching in 2022 the level of 53.8 Gt CO_{2eq}[27], which is 2.3% higher than 2019 and 1.4% higher than 2021. In 2020, the GHG emissions from transport experienced the largest drop compared with the pre COVID-19 year (-14.1%). However, in 2022, this sector experienced the largest increase, rising by 4.7%. In 2022, GHG emissions from the building sector only saw a marginal decrease of 0.4% compared with 2021, year in which these emissions grew by 4.6%. Global per-capita emissions in 2022 increased by 0.4% to reach 6.76 t CO_{2eq}/cap, a value still 0.8% lower than in 2019.

Figure 2. Global GHG emissions by sector (left axis, bars) and per capita (right axis, black line), 1970-2022 (in Gt CO_{2eq})



Source: JRC, 2023

Figure 3 shows total annual GHG emissions of the EU27 and the other five top-emitting countries in the world (China, the United States, India, Russia and Brazil) from 1970 to 2022 including also uncertainty bands showing the 95% confidence interval of the emission estimates[28]. The corresponding per capita CO_2 emissions (in t

([20]) Power industry includes power and heat generation plants (public and auto-producers).

([21]) Industrial combustion and processes includes combustion for industrial manufacturing and industrial process emissions (e.g. non-metallic minerals, non-ferrous metals, solvents and other product use, chemicals, etc.).

([22]) Transport includes road transport, rail transport, domestic aviation, domestic shipping and inland waterway transport for each country. International shipping and aviation also belong to this sector and are presented separately in the country factsheets due to their international nature. Figure 2 includes also international shipping and aviation under the transport sector.

([23]) Buildings includes small-scale non-industrial stationary combustion.

([24]) Agriculture includes agriculture livestock (enteric fermentation, manure management), agriculture soils (fertilisers, lime application, rice cultivation, direct soil emissions, indirect N_2O emissions from agriculture), field burning of agricultural residues.

([25]) Waste includes solid waste disposed on land, solid waste composted and hazardous solid waste processing/storage, waste water handling, waste incineration.

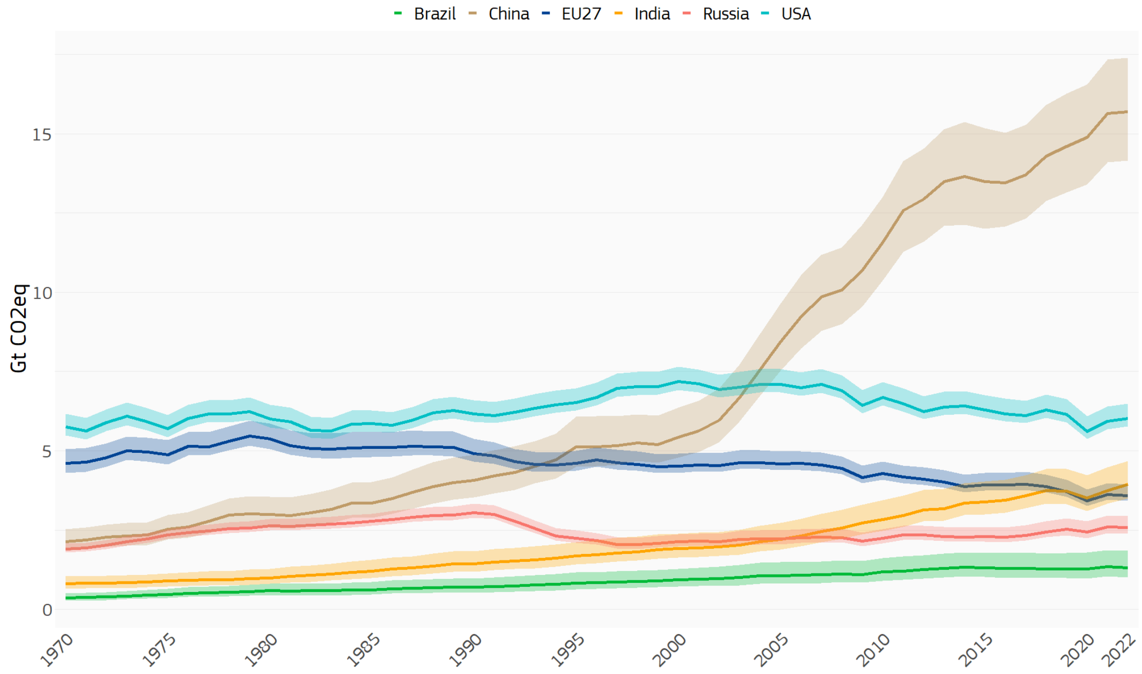
([26]) Fuel exploitation: fuel extraction, transformation and refineries activities, including venting and flaring.

([27]) Total GHG consists of CO_2, CH_4, N_2O and F-gas emissions which can be expressed in CO_{2eq} using their Global Warming Potential values established in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. More details are provided in Annex 1.

([28]) The estimated uncertainty considers the accuracy of both activity data and emission factor statistics. The tiered model of IPCC (IPCC, 2006a) is used to estimate the uncertainty, assigning lower/higher uncertainty to more/least developed countries (Solazzo et al., 2021). The overall accuracy depends on the degree of aggregation (global or country level, total or sector-specific, etc.).

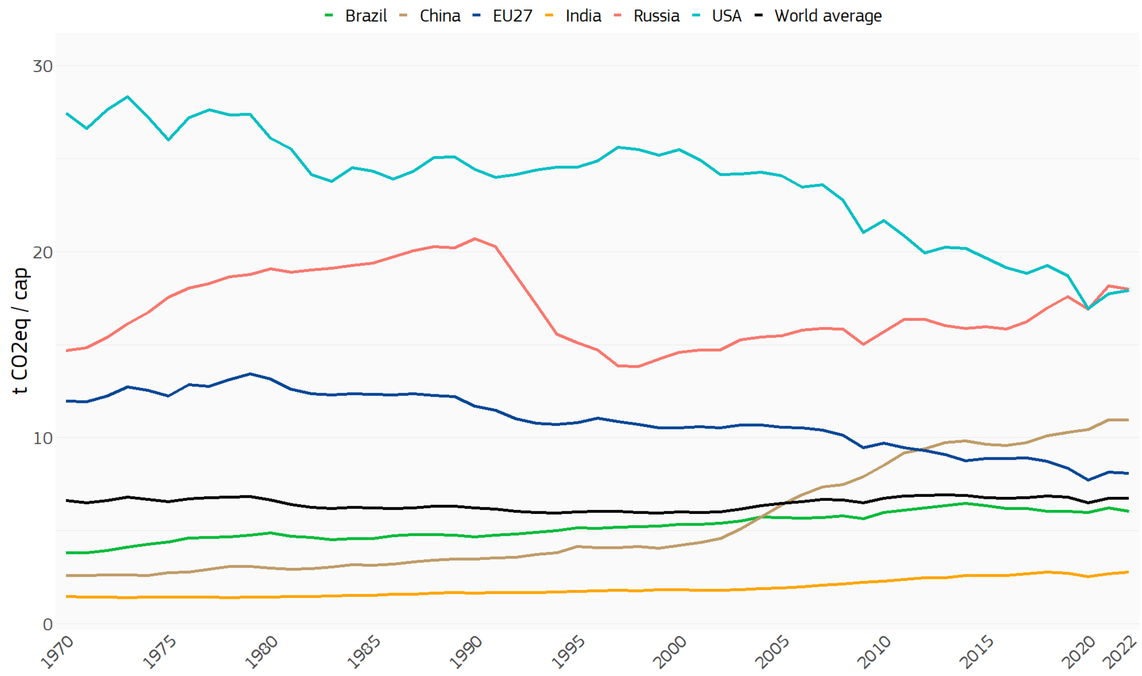
CO_{2eq}/cap) and the world average are represented in Figure 4. Figure 5 depicts the GHG emissions per unit of GDP PPP (in t CO_{2eq}/k USD) in top emitting economies and for the world average.

Figure 3. GHG emissions in top emitting economies and estimated uncertainty (coloured bands), 1970-2022, (in Gt CO_{2eq})



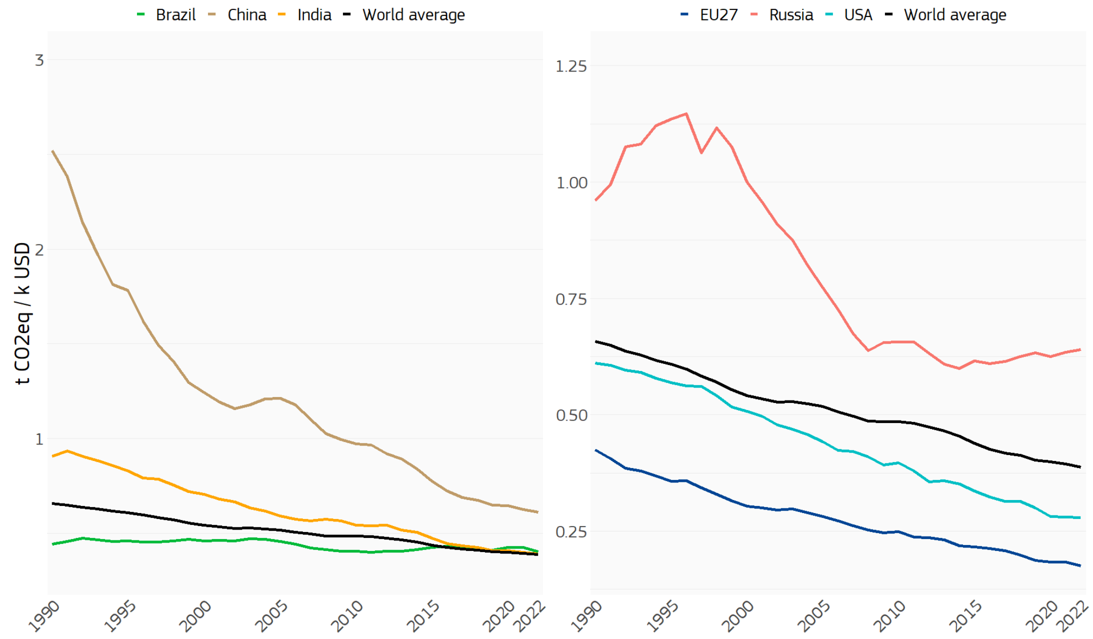
Source: JRC, 2023

Figure 4. GHG emissions per capita in top emitting economies, 1970-2022, (t CO_{2eq}/cap)



Source: JRC, 2023

Figure 5. GHG emissions per unit of GDP PPP in top emitting economies, 1990-2022, (t CO_{2eq}/k USD)[29]



Source: JRC, 2023

Global greenhouse gas emissions increased by 1.4% or 730 Mt CO_{2eq} in 2022, reaching a new record high of 53.8 Gt CO_{2eq}. This growth follows a 3.7% decrease in emissions during 2020, largely influenced by the impact of the COVID-19 pandemic, and a subsequent full rebound in 2021 with a notable increase of 4.8% (refer to Table 1).

Among the countries accounting for more than 1% of global emissions, only the EU27, Russia, Brazil and South Korea experienced a decrease in their total GHG emissions in 2022 compared with 2021, with respective reductions of 0.8%, 1.0%, 2.4%, and 0.7%. All other top emitters experienced a rise in their GHG emissions between 2021 and 2022. Notably, Indonesia saw a significant increase of 10%, while Mexico experienced a rise of 7.1%, and India recorded a growth of 5%. After the rebound of GHG emissions in 2021 and 2022, six regions/countries (EU27, USA, Australia, Japan, Canada, and South Korea) show emissions in 2022 lower than 2019, the last year before the pandemic. All other top emitters, including Turkey, China, Indonesia, Saudi Arabia, India, Mexico, Iran, Brazil, and Russia, have higher levels of emissions in 2022 compared to 2019, showing that their upward trend of emissions continued also after the rebound of emissions in 2021.

Global GHG emissions per capita have increased by about 8.3% from 6.24 t $CO2_{eq}$/cap to 6.76 t CO_{2eq}/cap between 1990 and 2022. In terms of emissions intensity per GDP PPP in 2022 they reached 0.386 tCO_{2eq}/k USD, which is 2% less than in 2021. However, this decrease was higher when compared with only 0.7% decline observed between 2020 and 2019 (see Table 2).

Table 2 shows GHG emissions and GDP PPP[30] changes in G20 economies in 2022 compared with 2021 for the whole world and the largest economies, including the EU27. Table 2 also illustrates the comparison of emissions intensity of each economy (defined as CO_{2eq} emissions per unit of GDP PPP) between 2022 and 2021, but also 2020 versus 2019 (COVID-19 effect), 2021 and 2022 versus 2019 (rebound effect to pre-pandemic levels). All the reported economies had increases in GDP PPP in 2022 except for Russia, Indonesia and Mexico (see Table 2). For several countries, the recovery pace of GDP PPP in 2022 was higher than the rebound of the emissions, and a decrease of the GHG intensity of economy[31] was observed when comparing with pre COVID-19 pandemic years but also with

(29) On the left hand side emerging economies are represented while industrialised countries are on the right hand side.

(30) GDP: Gross Domestic Product GDP, expressed in Purchasing Power Parity (PPP) (constant 2017 international $, USD). The difference with GDP nominal is that GDP PPP is adjusted for the difference in the level of prices and is in constant prices (but not adjusted for inflation). GDP PPP data (expressed as billion USD, 2017 prices and PPPs) are mainly sourced from World Bank (WB, 2023) and complemented for missing countries with IEA GDP data (IEA, 2022a). For countries where the 2022 GDP data were not available (i.e. Afghanistan, Cuba, Lebanon, Syria, Gibraltar, Greenland, North Korea), the 2021 or 2020 value was considered also for 2022.

(31) In the column of GHG intensity (in terms of GDP PPP) the following colour code for circles is applied when comparing the 2022 and 2021 data: Red for "increase" and, Green (with check mark) for "decrease".

2021. However, for some economies such as Russia, Indonesia and Mexico, this recovery was not enough to offset the rebound of emissions.

Table 2. GDP PPP and GHG emissions intensity of economy in G20 countries – 2022 compared to 2021 and yearly change of GHG emissions intensity for period 2019 -2022

Country	GDP PPP 2022	Emissions/GDP PPP 2022	GDP PPP change 2021-2022	Emissions change 2021-2022	Emissions/GDP PPP change 2021-2022	2019-2020	2019-2021	2019-2022
World	139438	0.386	3.4%	1.4%	-2.0%	-0.7%	-2.0%	-3.9%
China	25685	0.611	3.0%	0.3%	-2.6%	-0.4%	-3.5%	-6.0%
United States	21565	0.279	2.1%	1.6%	-0.5%	-6.1%	-6.6%	-7.0%
EU27	20479	0.175	3.6%	-0.8%	-4.3%	-2.1%	-2.1%	-6.3%
India	10057	0.392	7.0%	5.0%	-1.8%	0.2%	-2.0%	-3.8%
Japan	5210	0.227	1.0%	0.6%	-0.4%	-1.1%	-2.0%	-2.4%
Russia	4027	0.641	-2.1%	-1.0%	1.1%	-1.2%	0.2%	1.3%
Indonesia	3419	0.363	5.3%	10.0%	4.5%	-2.9%	-4.4%	-0.1%
Brazil	3250	0.403	2.9%	-2.4%	-5.2%	3.1%	3.2%	-2.1%
United Kingdom	3136	0.136	4.1%	0.2%	-3.7%	2.6%	-0.5%	-4.2%
Türkiye	2816	0.244	5.6%	3.1%	-2.3%	1.6%	-1.0%	-3.3%
Mexico	2492	0.329	3.1%	7.1%	3.9%	1.6%	0.4%	4.4%
South Korea	2347	0.309	2.6%	-0.7%	-3.2%	-3.6%	-3.4%	-6.4%
Canada	1906	0.397	3.4%	3.2%	-0.2%	-3.3%	-5.2%	-5.3%
Saudi Arabia	1821	0.445	8.7%	3.9%	-4.4%	3.7%	3.0%	-1.5%
Australia	1325	0.431	3.6%	1.7%	-1.8%	-3.8%	-7.8%	-9.5%
Argentina	1038	0.369	5.2%	1.2%	-3.8%	6.7%	1.8%	-2.1%
South Africa	807	0.663	2.0%	-2.5%	-4.5%	-3.7%	-8.7%	-12.8%
Germany	4503	0.174	1.8%	-1.1%	-2.8%	-3.7%	-1.0%	-3.8%
France	3126	0.138	2.6%	-2.8%	-5.2%	-1.4%	0.7%	-4.5%
Italy	2579	0.153	3.7%	0.5%	-3.1%	-0.4%	-0.4%	-3.5%

Source: JRC, 2023

Box 1. Impacts of the Ukraine war and energy crisis in EU

Since the invasion of Ukraine by Russia in March 2022, significant efforts have been made by the European countries and the US to reduce their dependence on energy imports from Russia. The EU has introduced by mid-May 2022 the REpowerEU[32] plan, which establishes an EU Energy Platform to facilitate collective procurement of gas, including Liquified Natural Gas (LNG), and potentially hydrogen in the future. Main actions included in the plan are: exploring alternative approaches to guaranteeing energy provision; enhancing gas storage capacity to ensure accessible and affordable energy for Europeans; encouraging massive funding and support for the expansion of renewable energy initiatives; engagment at reducing gas demand across all member states of the European Union.

REpowerEU plan also suggests raising the EU's target for renewable sources' share in final energy consumption by 2030 from 40% to 45% and also recommends expediting the permitting process for large-scale renewable projects. Additionally, the plan proposes increasing the binding energy consumption reduction target for 2030 from 9% to 13% relative to the levels seen in 2020.

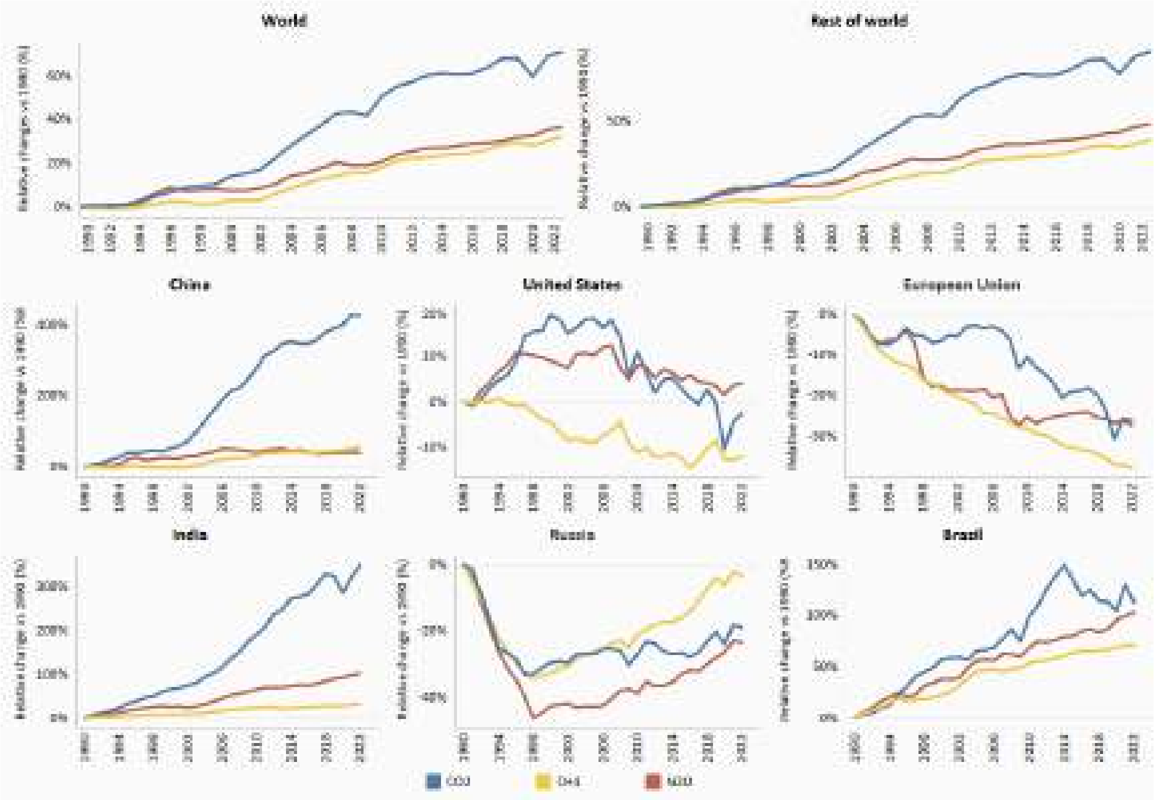
In August 2021, Russian gas accounted for 45% of the EU's gas import, while 40% was sourced from other suppliers, and the remaining portion was fulfilled by LNG. However, by August 2022[32], the import of Russian gas declined significantly to 18%, with 50% of the EU's gas coming from other pipeline suppliers, and approximately 30% being LNG. As of September 2022[32], the share of Russian gas in the EU's pipeline gas imports has significantly decreased to only 9%.

Council Regulation (EU) 2022/1369[33] adopted a voluntary demand reduction on the gas consumption for winter 2022-2023 by 15%. Between August 2022 and March 2023, the consumption of natural gas in the EU witnessed a decline of 17.7% compared to the average gas consumption for the corresponding months (August to March) from 2017 to 2022[34].

According to quarterly reports released by the Market Observatory for Energy of the European Commission[35], the EU gas consumption fall drastically by the end of 2022, 21.4% below the consumption in Quarter 3 of 2022. During the Quarter 4 of 2022 retail gas prices for household customers in several EU capital cities saw a significant decrease. This has marked the first time since the start of the crisis that such a reduction has occurred.

([32]) https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en
([33]) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R1369
([34]) https://ec.europa.eu/eurostat/web/products-eurostat-news/w/DDN-20230419-1
([35]) https://energy.ec.europa.eu/system/files/2023-05/Quarterly%20Report%20on%20European%20Gas%20Markets%20report%20Q4%202022.pdf

Figure 6. Trends of CO_2, CH_4 and N_2O emissions in world total, rest of the world and top six emitting economies, 1990-2022, relative change vs 1990 (%)



Source: JRC, 2023

In 2022, the majority of GHG emissions primarily consisted of CO_2, resulting from the combustion of fossil fuels (71.6%). CH_4 contributed 21% to the total, while the remaining share of emissions comprised N_2O (4.8%) and F-gases (2.6%). Figure 6 shows the emission trend since 1990 by substance for the world and top emitters. Fossil CO_2 emissions have experienced a significant global increase of over 70% since 1990. In the same period CH_4 increased by 32.4% and N_2O by 36.5%, while F-gases have seen a four-fold increase.

In the EU27, a consistent downward trend is found for CO_2, CH_4, and N_2O, with the trend for CH_4 being more pronounced. The USA experiences the downward trend for the three gases, with the decrease in N_2O emissions similar to that of CO_2.

However, in China and India, fossil CO_2 emissions have significantly increased (by a factor of nearly 5 in China and 4 in India) compared to the increases in CH_4 (by a factor of 1.6 and 1.3, respectively) and N_2O (by a factor of 1.4 and 2, respectively).

In Russia, after a drastic decrease from 1990 to 1998 due to the fall of the USSR and the subsequent economic crisis, CO_2, CH_4 and N_2O emissions have increased. The rate of CH_4 increase has been faster than that of CO_2 and N_2O. Brazil has experienced an overall increase in CO_2, CH_4, and N_2O emissions following a similar trend since 1990. In comparison to 1990, Brazil now ranks as the sixth top emitter, surpassing Japan.

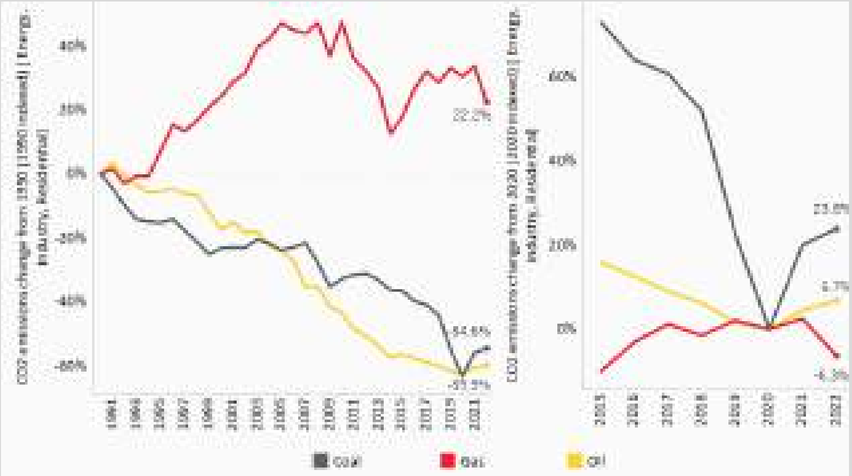
In the **EU27**, there was a 0.8% (30 Mt CO_{2eq}) decrease in total GHG emissions in 2022 compared to 2021, as indicated in Table 1. It is noteworthy that despite their 2021 rebound, EU27's emissions remained below the pre-COVID-19 levels, continuing their decades-long decreasing trend.

In 2022, several EU27 countries experienced a decrease in their emission levels compared to the previous year, with the largest relative drops observed in Luxembourg (-11.1%), Belgium (-6.4%), Lithuania (-6.3%), Estonia (-6.3%), and the Netherlands (-6.1%). On the other hand, the largest increase in 2022 was observed in Bulgaria (+8.0%), followed by Spain (+7.4%), Portugal (+3.7%), Greece (+3.4%), Ireland (+2.2%), and Malta (+2.0%). In terms of contribution to the EU27's GHG emissions in 2022, Germany remained the largest emitter (21.9%), followed by France (12.0%), Poland (11.2%), Italy (11.0%), and Spain (9.2%).

Box 2. How EU27 energy related CO_2 emissions have changed in 2022

The EU27 energy[36] related CO_2 emissions were in 2020 nearly 45% below the level of 1990. An increase by nearly 9.5% took place in 2021 followed then by a drop of 2.0% in 2022. The main sources of the rebound of the EU27 energy related CO_2 emissions in 2021 were from the coal use in power and industrial sectors, respectively by 21.5% and 14.7%. In residential sector the CO2 emissions from coal increased by 11% over the same period. The decrease in the level of these energy related emissions in 2022 was determined by the drop of emissions from gas use, with 8.6% less than in 2021 while the increase of emission from coal and oil were respectively 3.1% and 2.2%.

Relative changes in the EU27 energy related CO_2 emissions, 1990-2022 (1990 and 2020 indexed)



Source: JRC, 2023

The EU27 energy related CO_2 emissions from coal has been on decline after 2012 with the largest drop in 2020, year in which these emissions were nearly 16% lower than those from gas. In 2022 these emissions continued to increase further after the rebound in 2021 being nearly 24% (+121 kt) higher when compared with 2020.

The increasing overall trend since 2014 of CO_2 emissions from gas has been interrupted in 2021 showing a decrease by 6.3% (-38 kt) when comparing to 2020. CO_2 emissions from gas consumption saw the largest decreases in residential and industry sectors where a drop by 9.6% and 9.1% respectively took place in 2022 compared to 2020. The reduction was modest in power sector, only by 2.0%.

A shift, even partially, gas-to coal/oil on energy related CO_2 emissions has been observed in some of the EU27 countries during 2021-2022 period. Six EU27 countries increased their energy related CO_2 emissions in 2022 comparing with 2021: Bulgaria (+11.8%), Spain (+13.2%), Czechia (+2.6%), Ireland (+1.5%), Italy and Greece (+0.3% each).

In Bulgaria, the energy related CO_2 emissions were 16.7% less when sourcing from gas and 18.2% higher when sourcing from coal and 10% higher when sourcing from oil. In Spain, the increase of emissions from coal (+4.9%) was accompanied also with the increase of emissions from gas (+9.6%) as well as from oil (+7.5%) which affected the overall increase of CO_2 emissions between 2021 and 2022. In Greece, despite the energy related CO_2 emissions from gas dropped by 12.0% in 2022 the increase of these emissions from oil (+12.7%) determined the overall trend of CO_2 emissions. In Ireland the drop by 20% of energy related CO_2 emissions were partially compensated by the increase of these emissions from the use of gas (+5.6%) and oil (+10.3%). In Czechia, the energy related CO_2 emissions dropped by 17.4% when sourced from gas and increased by 9.3% higher when sourced from coal. In Italy, the decrease of energy related CO_2 emissions was by only 0.6% when sourced from gas and the increase by 13.9% when sourced from coal.

In other countries the energy related CO_2 emissions decreased mostly in Luxembourg (-24%), in Latvia (-20.3%0, in Lithuania (-17.8%), in Hungary (-13.9%) and in Denmark (-12.8%). In countries as *Lithuania*, *Luxembourg* and *Latvia* the drop in the energy CO_2 emissions related to gas was considerable respectively by 25%, 33% and 25% whereas no change was seen in these emissions from coal and oil. *Hungary* experienced a drop in energy related CO_2 emissions from both gas and coal respectively by 15.4% and 16.7%. Netherlands also decreased the energy related CO_2 emissions from gas by 19% but at the same time, these emissions sourced from oil increased by 7.3%.

Over the same period in some countries, the reduction of emissions from gas has been notably higher compared to the increase from coal: in Estonia, these emissions from gas halved in 2022 after being stable between 2020 and 2021, whereas the emissions from coal increased by 9.1%. In Finland, emissions from gas dropped by 37% in 2022 whereas those form coal and oil remained stable.

([36]) CO_2 emissions from power, residential and industry sectors are included here.

In the EU27, except for the transport and power industries, all other sectors experienced a decrease in their GHG emissions in 2022. The largest relative drop was observed in the buildings sector, in which emissions decreased by 6.5%. The industrial combustion and processes showed the second-highest decrease, falling by 4.3% below the 2021 levels. Emissions in the transport sector increased by 4.0%, while in the power sector the increase was 1.9%.

From a longer-term perspective, GHG emissions in the EU27[37] have been on a decreasing trend over the past three decades, and in 2022 they were 3.6 Gt CO_{2eq}, i.e., 27% below the 1990 level (see Figure 3). The EU27's share of global emissions has also decreased over the last decades (from 14.8% in 1990 to 7.8% in 2015 and 6.7% in 2022).

CO_2 accounted for 78.2% of EU27 GHG emissions in 2022. CH_4 contributed by 13.5%, N_2O by 6% and F-gases with 2.3%. Fossil CO_2 emissions in the EU27 have decreased by 26%, N_2O by 27.1% and CH_4 by 37.6% from 1990. In the same time span, emissions related to F-gases increased by 67.2%. In terms of per capita emissions, the EU27's GHG emissions amounted to 8.09 t CO_{2eq} per person in 2022 (see Figure 4), representing a 0.8% decrease compared to 2021 (8.15 t $CO2_{eq}$/cap). GHG emissions per unit of GDP PPP reached 0.175 t CO_{2eq}/k USD in 2022, indicating a 4.3% decrease compared to 2021.

In the overall picture for the EU27, the rebound from COVID-19 pandemic situation has caused an interruption of the decreasing trend of coal used in the power sector. In 2021, the rebound in coal utilisation within the EU27 power sector resulted in a notable 20% increase compared to the previous year, during which coal usage decreased by 21%. This upward trend in coal consumption continued in 2022, influenced also significantly by the energy crisis stemming from the conflict in Ukraine. As a response to the uncertainties and rise to extraordinarily high gas prices caused by this crisis, some EU27 Member States have temporarily adjusted their energy mix consumption, favouring an increased on coal to ensure a stable power supply (see Box 1 and Box2).

China's GHG emissions increased by 0.3% in 2022 compared to 2021, reaching 15.7 Gt CO_{2eq}. During the pre-pandemic, pandemic and post-pandemic years, its GHG emissions increased by 2.2%, 1.9% and 5.1% respectively. China's GHG emissions in 2022 were almost four times larger than in 1990 (+285%) and accounted for 29.2% of global GHG emissions (in 1990, this share was 12.2%). This increase is mainly due to increased economic activities which resulted in an increase of CO_2 emissions, which were 5.3 higher than in 1990 and accounted for 80.8% in total national GHG whereas the non-CO_2 GHG gases, i.e. CH_4, F-gases and N_2O, contributed in 2022 by 13.8%, 3.0% and 2.5%, respectively.

The main sectors contributing to the CO_2 emissions in 2022 were power industry (46.6%), industrial combustion (23.9%) and transport (6.9%). The contributions to CH_4 emissions were from fuel exploitation (43.1%), agriculture (29.4%) and waste (23.0%) sectors, while for N_2O they were from agriculture (62.5%) and processes (10.8%). The per capita GHG emissions in 2022 (10.95 t CO_{2eq}/cap) were 6.5% higher than in pre-pandemic 2019 (10.29 t CO_{2eq}/cap), while GHG emission per GDP PPP amounted to 0.611 t CO_{2eq}/kUSD, having the second highest GHG intensity among top emitting economies (see Table 2).

Emissions of GHGs in the **United States** increased in 2022 by 1.6% in comparison with 2021 (see Table 1), reaching about 6.0 Gt CO_{2eq} (see Figure 1). These emissions decreased already by 2.1% in pre-pandemic year followed by a greater decrease of 8.7% in 2020 compared to 2019 to rebound in 2021 with an increase of 5.5% compared to 2020. The contributions to the total national emissions by substance in 2022 were 80.7% CO_2, 12.4% CH_4, 3.7% N_2O and 3.2% F-gases.

Overall, emissions were only 2.4% lower in 2022 than in 1990. Emissions mostly fell between 2005 and 2020 (see Figure 3), primarily due to decreases in CO_2 emissions in the power industry and transport sectors, by 39.5% and by 16.6% respectively. In 2022, emissions per unit of GDP PPP were 0.279 t CO_{2eq}/kUSD, i.e., 0.5% lower than in 2021 (see Table 2), continuing the decreasing trend of the previous years. The per capita GHG emissions in 2022 (17.90 t CO_{2eq}/cap) were 4.3% lower than in 2019 pre-pandemic year (18.70 t CO_{2eq}/cap), very close to Russia's value which is much higher than other top emitters (see Figure 4).

India's GHG emissions increased by 5.0% (or 0.19 Gt CO_{2eq}) in 2022 compared to 2021, reaching a level 5.7% higher than the pre-pandemic 2019 level (see Table 1). In the last three decades, India's emissions have increased almost continuously, and were almost 3 times higher in 2022 than in 1990 (see Figure 3). In 2022 the shares of CO_2, CH_4, F-gases and N_2O in total national emissions expressed in CO_{2eq} were 68.3%, 23.5%, 1.7% and 6.5% respectively.

([37]) As mentioned in the executive summary, EDGAR emission estimates aim to contribute to the upcoming UNFCCC Global Stocktakes, complementing officially reported national emission inventories which are also based on IPCC reporting guidelines and reviewed by UNFCCC. The EDGAR data are different from those used to track the accomplishment of EU reduction policies and officially submitted to UNFCCC.

The increase in GHG emissions from 1990 in India is mainly due to the increase in CO_2 emissions from power industry and industrial combustion, which were 6 and 4 times higher respectively in 2022 compared to 1990. With a share of approximately 7.3% in the total global emissions in 2022, India is the third largest emitting economy after China and the United States. However, India's per capita emissions (2.79 t CO_{2eq}/cap in 2022) are six times lower than those of the United States and Russia, four times and three times lower than those of China and the EU27 and less than half than those of Brazil. India's emissions per unit of GDP PPP were 0.392 t CO_{2eq}/kUSD in 2022, i.e., 1.9% lower than in 2021.

In 2022, **Russia**'s GHG emissions decreased by 1% compared to 2021, and increased by 2% compared to the pre-pandemic level of 2019 (see Table 1). Compared to 1990, in 2022 emissions were 15.5% lower (see Figure 3). With a 4.8% share of global emissions in 2022, Russia was the fifth largest emitter after China, the United States, India and the EU27. Per capita emissions (17.98 t CO_{2eq}/cap in 2022) were at the same level of the United States, but they are higher than those of China (by 64%) and the EU27 (by 122%) (see Figure 4). Emissions per unit of GDP PPP were 0.641 t CO_{2eq}/k USD in 2022, i.e., 1.1% higher than in 2021 (see Table 2).

In 2022, **Brazil's** GHG emissions decreased by 2.4% compared to 2021, and increased by 2.3% compared to the pre-pandemic level of 2019 (see Table 1). Compared to 1990, in 2022 emissions are 88.4% higher (see Figure 3). With a 2.4% share of global emissions in 2022, Brazil is the sixth largest emitter after China, the United States, India, EU27 and Russia. In contrast to the other top emitters, CH_4 accounts for the largest share of emissions (51.1%) followed by CO_2 (35.6%), N_2O (12%) and F-gases (1.2%). In 2022, Brazil per capita emissions were 6.05 t CO_{2eq}/cap, 10.7% lower than the world average.

3 Global GHG emissions from LULUCF from 1990 until 2022

This edition of the EDGAR booklet includes annual estimates of CO_2 emissions and removals from Land Use, Land-Use Change and Forestry (LULUCF), identified as one of the key sectors for tackling climate change and for compliance with emission reduction strategies (IPCC 2019a). The inclusion of emissions from LULUCF helps to provide a more complete overview of global CO_2 fluxes. However, LULUCF is an extremely complex sector to account for in terms of carbon emissions and removals, due to the inherent complexity of terrestrial ecosystems and the difficulty of disentangling anthropogenic and natural fluxes.

In this version of the EDGAR-LULUCF dataset, only the living biomass pools (i.e., above- and below-ground biomass) of the "Forest Land" category and the emissions from biomass burning have been estimated independently, while the other LULUCF fluxes (i.e., non-biomass forest pools and non-forest categories) were taken from a compilation of the official country reporting to the UNFCCC (Grassi et al., 2022). Emissions from biomass burning are estimated within the Global Wildfire Information System (GWIS) (Artés et al., 2019).

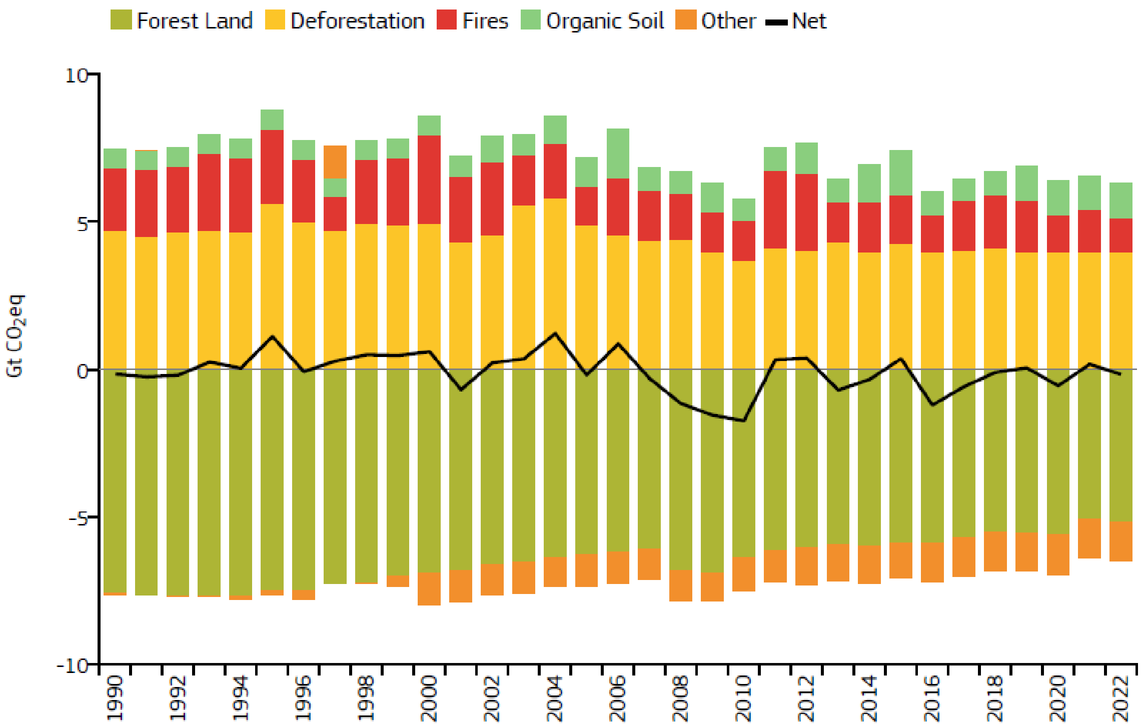
We focus on Forest Land (i.e. managed forest existing for at least 20 years and land converted to Forest Land within the previous 20 years) because this category is very important in terms of absolute CO_2 fluxes, but its reporting is often incomplete (especially in developing countries) and the attribution of anthropogenic vs. natural fluxes is very uncertain. Furthermore, within this category, we focus on living biomass because it is by far the most important carbon pool (typically representing >80% of the net CO_2 flux, based on data from Annex I countries). The estimates for forest land presented here combine satellite-derived data to track land use with specific default IPCC factors for forest growth and country statistics for forest harvest (see Annex 2 for details). The IPCC factors provided in the IPCC Guidelines are often very uncertain and show a high variability across different continents (even for the same tree species or forest types). Compared to the 2022 edition, in this version of the dataset a careful and thorough review of the parameters' values has been performed to obtain a more homogeneous and consistent set of values. It should be noted that our estimates are based on the IPCC Tier 1 approach, i.e. the most basic approach to estimate GHG fluxes.

Our estimates serve as a valuable source of information for areas where official estimations are lacking or limited (e.g. several African countries). However, it is important to clarify that our intention is not to challenge or verify the estimates provided by individual countries when they utilize locally available parameters, reliable datasets, and advanced methods (Tier 2 or Tier 3). This particularly applies to Annex I countries. This year, we have substantially improved our methodology, thoroughly updated, and reviewed the reference data.

In terms of attribution of anthropogenic fluxes, the approach used here is, in principle, comparable with what most countries include in their GHG reporting prepared following the IPCC Guidelines for National GHG inventories (IPCC, 2006a; IPCC, 2019b), but differs from the global models used in the IPCC reports (e.g., IPCC, 2022). Global models typically consider as managed forest only those areas subject to intense harvest, whereas countries may define managed forest more broadly within their GHG Inventories and thereby include a much larger area. In addition, countries generally include in their GHG inventories most of the natural response of land to human-induced environmental changes (e.g., CO_2 fertilization, etc.), while the global model approach treats this response as part of the non-anthropogenic flux (Grassi et al., 2021; IPCC, 2019a). Our approach is closer to country GHG inventories because we filter the total satellite-derived forest area with non-intact forest area, which is a reasonable proxy for countries' managed forests (Grassi et al., 2021), and because the IPCC growth factors are expected to incorporate most of the recent human-induced environmental changes.

For the other LULUCF fluxes, we use a compilation of countries' data officially reported to the UNFCCC (Grassi et al., 2022), including GHG Inventories for Annex I parties (complete time series 1990-2022, with 2022 assumed to be equal to 2021) and other GHG reporting such as National Communications, Biennial Update Reports, Nationally Determined Contributions and REDD+ submissions for Non-Annex I parties (often incomplete time series, gap-filled when necessary). In this booklet, we aggregated the available data into categories aimed to be a minimum common denominator between the detailed reporting of Annex I countries, the often coarse reporting from non-Annex I countries, and the outputs by the global models (Grassi et al., 2023; Friedlingstein et al., 2022). These categories are 'deforestation', 'organic soil', and 'other'. Deforestation incudes CO_2 emissions reported under 'Forest conversion to other land use categories'. Organic soils includes data from all land uses, including peat fires (e.g., in Indonesia). The category 'other' includes all the fluxes not covered in the previous categories, e.g. from non-biomass forest pools and from other land use categories such as cropland, grassland, wetlands, settlements, and Other Land. We also include in EDGAR-LULUCF part of the emissions associated with wild fires from the GWIS database (see details in Annex 3). Since CO_2 emissions from forest fires in tropical regions can be assumed to be mostly associated to deforestation practices (e.g. Van der Werf et al., 2017), to avoid to double counting we excluded them from the EDGAR dataset. Forest fire emissions in non-tropical regions were included in our estimates of net CO_2 fluxes. Moreover, CH_4 and N_2O emissions arising from crops burning are removed from GWIS to avoid double counting with EDGAR emissions from the agricultural residue burning sector. GHG emissions and removals from LULUCF are here below presented for the world (see Figure 7) and for the EU27 (see Figure 8) from 1990 to 2022.

Figure 7. Global GHG emissions and removals from LULUCF sector (in Gt CO_{2eq}), 1990-2022



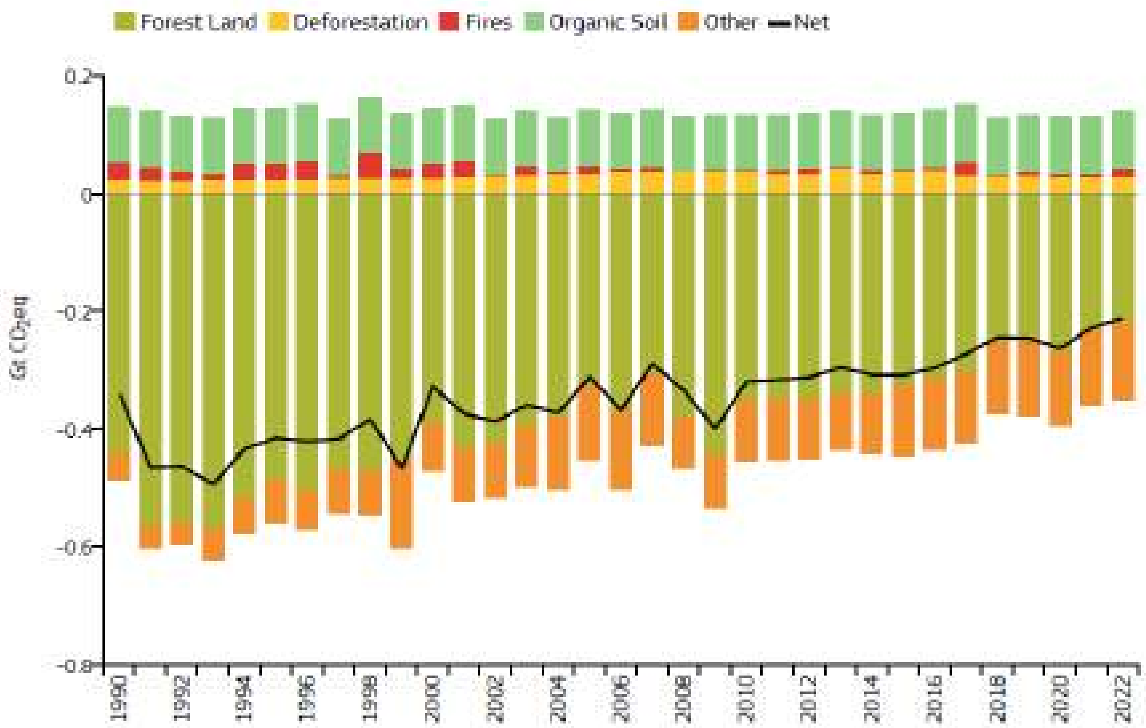
Source: JRC, 2023

Global: The LULUCF sector was estimated to remove about 0.18 Gt CO_{2eq} (or 1.35 Gt CO_{2eq} excluding wildfires) in 2022, approximately the same level of 1990 and 90% less than in 2010. Including fires, this net removal is equivalent to 1.85% (or 0.33%) of global fossil CO_2 (or total GHGs) emissions without LULUCF of 2022.

Based on our estimates, managed forests (living biomass, excluding deforestation) are by far the largest CO_2 removal category, with an estimated 5.2 Gt in 2022, equivalent to about 13.9% of global anthropogenic fossil emissions (excluding LULUCF) emitted in the same period. This independently estimated net removal is lower than what countries include in their GHG reports (about 6.3 Gt CO_2, Grassi et al. 2022); the difference may be explained by different methodologies and assumptions between country reports and our approach. In particular, we estimate a larger C gain in the boreal area (e.g., in Russian Federation and Canada), mostly due to the IPCC default factors suggesting a greater tree growth than the country GHG reports, and larger C losses in some tropical areas, mostly due to the high values of harvest reported by some countries to FAOSTAT (e.g., India, Ethiopia). In most cases, it can be assumed that the local data and approaches used in country GHG reports which use Tier 2 or Tier 3 methods are better suited for GHG reporting than the global-scale implementation of a default IPCC Tier 1 approach, as done in our study.

In 2022, based on GWIS data, global wildfires contributed to LULUCF emissions for 1.2 Gt CO_{2eq}. For the same year, based on country GHG reports, global deforestation was responsible for net CO_2 emissions of 4.0 Gt CO_2, equivalent to 10.4% (or 7.46%) of the total anthropogenic CO_2 (or GHG) emissions. Among the other components, in 2022 organic soils were a rather stable with emissions emission of about 1.16 Gt CO_2. The large difference between the net LULUCF estimates in this booklet and those from the IPCC reports (which report net anthropogenic land-use emissions of about 5 to 6 Gt CO_2/yr, IPCC, 2022) can be to a large extent explained by different approaches in assessing the “anthropogenic” CO_2 removals, i.e. this booklet (consistently with most country GHG reports) consider anthropogenic part of the CO_2 removals that global models (as reflected in the IPCC reports) consider natural. Once the difference in defining the 'anthropogenic' sink between countries and models are understood, LULUCF estimates can be largely reconciled at global and regional level (Grassi et al. 2021; Grassi et al., 2023).

Figure 8. EU27 GHG emissions and removals from LULUCF sector (in Gt CO_{2eq}), 1990-2202



Source: JRC, 2023

EU27: The LULUCF sector produced a net removal of CO_2 emissions of 0.212 Gt CO_2 (or 0.224 Gt CO_{2eq} when excluding wildfires) in 2022, approximately 38% less than the 1990s levels. The total CO_2 emitted including wildfires is equivalent to approximately 7.6% of EU27 fossil anthropogenic CO_2 emissions excluding LULUCF.

Living biomass in managed forests is by far the most important C sink, with an estimated net 0.22 Gt CO_2 in 2022, equivalent to 7.9% of fossil CO_2 emitted in EU27 in the same period excluding LULUCF. The other components (non-biomass forest pools, deforestation, organic soils and other, based on country GHG reports) were compensating each other, with a net sink of 0.003 Gt CO_2 in 2022. Based on our estimates, wild fire emissions represent a minor component for EU27 in 2022, with a contribution of 0.012 Gt CO_{2eq}, although this figure obviously vary greatly according to the fire season severity (0.021 Gt CO2 were emitted in 2017). It is important to highlight that these data are not aimed at criticizing nor challenging what is produced by Member States in their reporting process under the climate agreements, which are by definition with the best data and methods locally available and with several country-specific assumptions. This study is, on the contrary, part of a global methodologically coherent estimation at Tier 1.

4 Conclusions

The Emissions Database for Global Atmospheric Research (EDGAR) is a comprehensive inventory of anthropogenic emission time series from 1970 until 2022 for GHG. The data used in this report consists of the IEA-EDGAR CO_2, EDGAR CH_4, EDGAR N_2O and EDGAR F-gases version 8.0. An IPCC-based bottom-up emission calculation methodology is applied to all countries, demonstrating that consistent inventories can be developed for all countries within the limitations of the quality of the available statistical data.

EDGAR complements the national inventories and reporting prepared by Parties to the Paris Agreement, in particular by producing a timely independent emissions estimate[38] based on the consistent application of homogeneous information and methodological tools across countries. In particular, the time series of EDGAR can provide collective emissions trend information for all countries that will be needed for the UNFCCC's Global Stocktake in 2023.

Overall, EDGAR provides an important input to the analysis of global GHG emission trends with its 52-year time series.

This report shows that global GHG emissions from anthropogenic activities have increased by nearly 1.5% annually on average since 1990, and they were around 62% higher in 2022 than in 1990. Global GHG emissions remained rather constant between 2014 and 2016, reaching a peak in 2019 at 52.6 Gt CO_{2eq}. After falling by 3.7% in 2020 (mainly because of the COVID-19 pandemic and its associated impacts), and rebounding during 2021, they were 2.3% higher in 2022 than in 2019.

In 2022, among the six major economies collectively contributing 61.6% to the global GHG emissions (China, USA, India, EU27, Russia, and Brazil), four showed increases in their emissions compared to pre-COVID values of 2019 (China +7.4%; India +5.7%; Russia +2.0%; Brazil +2.3%) while two showed a decrease (USA –2.2% and EU27 –3.4%).

This edition of the EDGAR booklet also includes estimates of GHG emissions from Land Use, Land Use Change and Forestry (LULUCF), resulting in a global removal of approximately 0.18 Gt CO_{2eq} in 2022. In the EU27, LULUCF removed about 0.21 Gt CO_{2eq} in 2022, reducing its absorption capacity significantly compared to 1990.

This edition of the EDGAR booklet also includes estimates of GHG emissions from Land Use, Land-Use Change and Forestry (LULUCF), resulting in a global net removal of approximately 0.18 Gt CO_{2eq} in 2022. This small net global flux actually reflects the difference between much larger removals (mostly from forest land) and emissions (mostly from deforestation and fires), each close to around 6 Gt CO_{2eq}. In the EU27, LULUCF reduced its absorption capacity significantly compared to 1990, but nevertheless it is still an important net removal, equal to about 0.21 Gt CO_{2eq} in 2022.

Overall, the reduction in global greenhouse gas emissions witnessed in 2020, although partially offset by the economic recovery in 2021, has been surpassed by several major economies. These countries are now reverting to the pre-pandemic patterns, including the trend of decreasing carbon intensity that was prevalent among most leading economies. However, it is worth mentioning that countries like Russia, Mexico, and Indonesia have observed an increase in the intensity of GHG emissions within their economies.

([38]) In the official National Inventory Reports, the latest reporting year can be up to two years prior to the submission year.

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List of abbreviations and definitions

AR5 - Fifth Assessment Report of IPCC
Cap - capita (population)
BGS - British Geological Society
CH_4 - Methane, greenhouse gas with GWP-100 = 28-30 under IPCC AR5
CO_2 - Carbon dioxide
DG CLIMA - Directorate-General for Climate Action, European Commission
EDGAR - Emissions Database for Global Atmospheric Research
EI – Energy Institute (formerly British Petroleum Company plc)
EIA - Energy Information Administration (of the U.S.)
EU27 - European Union with 27 Member States
F-gases – Fluorinated gases
GCSA - Global Cement and Concrete Association
GDP - Gross Domestic Product
GGFR - Global Gas Flaring Reduction Partnership of the World Bank
GHG - Greenhouse Gas
Gt - Gigatonnes (1000 megatonnes = 10^9 metric tonnes)
GWP-100 Global Warming Potential over a 100-year period
IEA - International Energy Agency of the OECD (Paris)
IFA - International Fertiliser Association
IMF - International Monetary Fund
IPCC - Intergovernmental Panel on Climate Change
JRC - Joint Research Centre of the European Commission
k USD - 1000 US Dollar GDP
LULUCF - Land use, land-use change and forestry
Mt - Megatonnes (10^6 tonnes or 1 tera gramme) mass of a given (greenhouse gas) substance
NBSC - National Bureau of Statistics of China
NOAA U.S. - National Oceanic and Atmospheric Administration
N_2O Nitrous oxide, greenhouse gas with GWP-100 = 265 under IPCC AR5
n/a - Not Available
OECD - Organisation for Economic Co-operation and Development
PPP - Purchasing Power Parity
t- tonne (1 t or 1 mega gramme) mass of a given (greenhouse gas) substance
UNFCCC - United Nations Framework Convention on Climate Change
UNPD - United Nations Population Division
USD - U.S. Dollar
USDA – United States Department of Agriculture
USGS - United States Geological Survey
Worldsteel - Word Steel Association
yr – Year

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Annexes

Annex 1. Bottom-up methodology for global GHG emissions compilation

The EDGAR v8.0 GHG emissions presented in this report include IEA-EDGAR CO_2 data (v2)[39] (IEA 2022b) covering fossil CO_2 emissions from combustion and processes, EDGAR CH_4, EDGAR N_2O and EDGAR F-gases up to 2022. In EDGAR, the emissions per country and compound are calculated on an annual basis and sector-wise by multiplying the country-specific activity and technology mix data by country-specific emission factors and reduction factors for installed abatement system for each sector. For the greenhouse gas emission factors, the global default values recommended in the IPCC 2006 guidelines (IPCC, 2006a) were used and where recommended, region-specific values were applied for other sources.

Regarding GHG emissions, all anthropogenic activities leading to climate relevant emissions are included (see Table 3), except biomass/biofuel combustion (short-cycle carbon) in the power, industry, buildings, transport, and agricultural sectors for CO_2 only. Large-scale biomass burning and land use, land-use change and forestry (LULUCF) are now part of the EDGAR estimations for CO_2 emissions.

EDGAR makes use of the IPCC sectorial classification, and a consistent bottom-up emission calculation methodology is applied to all countries, so that emissions of different countries can be compared, considering their respective levels of detail, uncertainties or data limitations. In particular, for developing countries with less robust and systematic statistical data infrastructures and limited experience in reporting their emission inventories, EDGAR can provide information and support them in complying with their inventory preparation.

In order to compute emissions up to the year t-1 for all sectors and gases, a Fast-Track approach is applied. For combustion sources, both IEA-EDGAR CO_2 (v2) emissions and non-CO_2 GHGs are extended until 2022 using the Energy Institute (EI, 2023) detailed statistics by fuel type for the years 2021 and 2022, while still assuming the same sectoral breakdown as in the last year of the IEA energy balance statistics. As a consequence of this approach, the emissions for the Fast-Track years (2021-2022) reported in this booklet will be updated in subsequent editions of this booklet, using future releases of the IEA energy balance statistics up to most recent years. For agriculture related sources, USDA (2023) data are used to extend FAOSTAT statistics up to 2022. For the other sectors with lower contributions to global GHG emissions, the time series have been extended for the latest years using proxy data and relative changes in activity data and trends to be applied to the latest available year. More details on the assumptions of the Fast-Track methdology are included in the following description of each emitting sector when relevant.

([39]) IEA-EDGAR CO_2 emissions from fossil fuel combustion are those reported by IEA from 1990 to 2020. Emissions from 1970 to 1989 are still based on IEA data, but complemented with additional statistics gathered over the years and included in previous releases of the EDGAR database. Furthermore, it includes non-energy use emissions computed from the IEA energy balances (IEA, 2022a) which are however not reported in the IEA CO_2 emissions (IEA, 2022b).

Table 3. Main activities included in EDGAR emissions estimations

GHG (fossil CO_2, CH_4, N_2O, F-gases)		IPCC 2006 categories	LULUCF (CO_2, CH_4, N_2O)		IPCC 2006 categories
POWER INDUSTRY	Power and heat generation plants (public and auto-producers)	1A1a	**FOREST LAND**	Forest land remaining forest land and other lands converted to forest	3B1
INDUSTRIAL COMBUSTION AND PROCESSES	Combustion for industrial manufacturing, industrial processes (e.g. iron and steel, cement, aluminium, chemicals, production, solvents, etc.)	1A2+2+5A (only from non-agricultural activities)	**DEFORESTATION**	Deforestation including tropical fires	3B2bi+3B3bi+3B5bi+3B6bi
BUILDINGS	Small scale non-industrial stationary combustion	1A4+1A5	**ORGANIC SOIL**	Drainage of organic soils	
TRANSPORT	Road, non-road, domestic and international aviation, inland waterways and international shipping	1A3	**OTHER**	Non biomass forest pools, cropland, grassland, settlements, wetlands and other lands	3B2+3B3+3B4+3B5+3B6
AGRICULTURE	Livestock (enteric fermentation, manure management), agricultural soils (fertilisers, lime application, rice cultivation, direct soil emissions, indirect N_2O emissions from agriculture), field burning of agricultural residues	3A+3C1b+3C2+3C3+3C4+3C5+3C6+3C7+5A (only from agricultural activities)	**FIRES**	Forest fires (boreal, temperate), peat fires, shrubland fires, non-tropical savannah fires	3C1a (excluding tropical areas)+3C1c+3C1d
FUEL EXPLOITATION	Fuel extraction, transformation and refineries activities, including venting and flaring	1B+5B			
WASTE	Solid waste disposed on land, solid waste composted and hazardous solid waste processing/storage, waste water handling, waste incineration	4			

Source: JRC, 2023

For combustion sources: detailed IEA-EDGAR CO_2 (v2) emissions (IEA,2022b) are used for the period 1970-2020 together with CH_4 and N_2O emissions from EDGARv8.0 (IEA, 2022a). To extend GHG emission time series from combustion sources up to 2022, trends based on EI (2023) consumption data by fuel type (coal, oil and gas) are applied to the corresponding 2020 values. In particular, EI (2023) oil regional consumption data trends from Jet/Kerosene fuel are applied to domestic aviation emissions to extend them up to 2022. To extend GHG emissions from international aviation transport, we rely on the latest data from the Industry Statistics from IATA Statistics (IATA, 2023), while for shipping (international and domestic) we use fuel oil regional consumption statistics from EI (2023). Biofuel combustion related emissions are extended using FAOSTAT (2023) data for primary solid biomass and charcoal, while biodiesel and biogasoline are derived from EI (2023).

For the countries belonging to "Other Africa"[40], "Other Non-OECD Asia"[41] and "Other Non-OECD Americas"[42] in the IEA classification: the combined share of CO_2 emissions from all these countries in global total is very small, e.g. in 2020, this was less than 1%. To allocate the corresponding activity data and emissions to each single country, we used splitting factors derived from the U.S. Energy Information Administration (EIA, 2023) country specific data on fuel consumption and production of coal, oil and natural gas. Consequently, the uncertainties in GHG emission estimations for these countries are larger than the ones for individually reported countries, in particular for the sectorial subdivision. Additional reliable data and information are needed to further improve their GHG emissions allocation.

For the fugitive emissions: CO_2 emissions from coke production for 2020 and 2021 follow the same relative change as reported for the crude steel production by the World Steel Association (worldsteel, 2023). CO_2 flared at oil and gas extraction facilities for 1994 onwards is based on the total amount of gas flared derived from satellite observation of the intensity of flaring lights per country (GGFR/NOAA, 2023). CH_4 emissions from venting are estimated based on data and information from UNFCCC (2023b), EPA (2023) and Höglund-Isaksson (2017). Compared to previous EDGAR CH_4 emission estimates, we also include fugitive emissions from abandoned mines following the methodology of the IPCC 2019 Refinements (IPCC, 2019b).

For the metal industry: the largest contribution is from blast furnaces, which in addition to the CO_2 emissions from blast furnace gas combustion (accounted for under the energy sector) emit also CO_2 from the coke/coal input as reducing agent and limestone used for iron and steel production. Here the crude steel production statistics reported by World Steel Association (worldsteel, 2023) are used as input to calculate CO_2 emissions. Ferro-alloys production data are from USGS (2023) up to 2019 and BGS (2023) up to 2021 which are further extended to the year 2022 using the pig iron production trends and data from World Steel Association (worldsteel, 2022), USGS (2023), BGS (2023) and NBSC (2023) for China.

For non-metallic minerals: CO_2 emissions from carbonates used in cement clinker production are based on reported or estimated cement clinker production. Cement production was calculated from cement production reported by the USGS (2023), except for China for the latest years (NBSC, 2023). The clinker-to-cement ratio is based on the clinker production data until 2020 from UNFCCC (2023a) for the Annex I countries, and for USA up to 2022 using USGS (2023) data; for China it is calculated from World Cement (2022). For Brazil, Egypt, Philippines and Thailand, we used clinker production ratios from the GCSA (2022) up to the year 2019 and then applied a constant trend. The changes in the lime production from USGS (2023) are applied to extrapolate CO_2 emissions from all other carbonate uses (glass production, etc.). Concerning the feedstock use for chemicals production, the ammonia production from USGS (2023) is used, except for urea consumption and production, where data are provided by the International Fertiliser Industry Association (IFA, 2022). It is assumed that small soil liming emissions follow the gross ammonia production trend.

For waste: GHG emissions from waste **incineration** (no energy recovery) include open burning of municipal solid waste (MSW), industrial solid waste, biogenic waste, clinical waste, sewage sludge waste, waste from cremation[43] and other waste. For Annex I countries the main data source for the activity data is the UNFCCC Locator (UNFCCC,

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([40]) Includes Burkina Faso; Burundi; Cape Verde; Central African Republic; Chad; Comoros; Djibouti; Gambia; Guinea; Guinea-Bissau; Lesotho; Liberia; Malawi; Mali; Mauritania; Namibia (until 1990); Réunion (until 2010); Sao Tome and Principe; Seychelles; Sierra Leone; and Somalia..

([41]) Includes Afghanistan; Bhutan; Cambodia (until 1994); Cook Islands; East Timor; Fiji; French Polynesia; Kiribati; Lao People's Democratic Republic (until 1999); Macau, China; Maldives; Mongolia (until 1984); New Caledonia; Palau (from 1994); Papua New Guinea; Samoa; Solomon Islands; Tonga and Vanuatu.

([42]) Includes Anguilla, Antigua and Barbuda; Aruba; Bahamas; Barbados; Belize; Bermuda; Bonaire; British Virgin Islands; Cayman Islands; Dominica; Falkland Islands (Malvinas); French Guiana (until 2010); Grenada; Guadeloupe (until 2010); Martinique (until 2010); Montserrat; Puerto Rico (for natural gas); Saba (from 2012); Saint Eustatius (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Maarten (from 2012); Suriname (until 1999); and the Turks and Caicos Islands.

([43]) Data sourced from https://www.cremation.org.uk

2023b). Population is used to fill the backward trend. To estimate waste incineration in non-Annex I countries, per capita generation figures from the IPCC are used, considering specific country or region data and urban population information for the year 2000. The fraction of MSW incinerated in 2000 is determined based on the total IPCC numbers for the fraction of incinerated MSW, with consideration for country or region-specific data. The dataset for waste incineration is completed using also reports from Non-Annex I countries to the UNFCCC, specifically on annual net emissions/removals under waste incineration (UNFCCC, 2023c). The year 2000 is taken as the base year, and population data is utilized to fill in the backward and forward trends.

CH_4 and N_2O emissions associated with **wastewater handling** have been updated until 2021, following the IPCC (2006c) methodology as outlined in Janssens-Maenhout et al. (2019). These updates consider the latest statistics from FAO (2023) on meat, pulp, sugar production, average protein supply, as well as data from UN (2023) and RFA (2023) for alcohol production. The population data, both urban and rural, are sourced from UNDP (2019).

The emissions from **landfills** are calculated using the first-order exponential decay method, following the 2006 IPCC Guidelines. For Annex I countries, waste data reported by the parties via the UNFCCC Locator tool is considered. To account for the global domain, additional sources include UN statistics on municipal solid waste (MSW) collection and landfill disposal, as well as per capita MSW generation rates and disposal fractions from the IPCC Guidelines. Non-Annex I countries maintain a constant per capita landfill waste estimate based on the latest available year, as advised by the IPCC Guidelines. In developing countries, municipal waste collection is assumed to occur solely in urban areas, utilizing urban population data from UN statistics (UNDP, 2019) (Janssens-Maenhout et al., 2019). For a more detailed information, refer to Oreggioni et al. (2021).

The emissions from waste **composting** are calculated using the UNFCCC Locator for the Annex-I countries. The methodology applied is that of IPPCC using the emission factor for “wet weight waste” for both CH_4 and N_2O. In the case of non-Annex I countries, UNSD/ENVSAT (2023) country data are utilized. The urban population is employed to address the backward and upward trends, following a similar procedure as applied to waste incineration.

Hazardous waste emissions are estimated using sources as Eurostat (for EU27, UK, Turkey and Western Balkan (WB) countries) and the UNSD/ENVSTAT (2023). The Non-Annex I countries are categorized into two groups: (i) countries with UNSD/ENVSTAT (2023) data on hazardous waste, and (ii) countries without UNSD/ENVSTAT (2023) data on hazardous waste. Additional data sources used are used as the biennial data from EPA[44] for the USA.

For agriculture: The agricultural sector encompasses various activities, including the application of urea and agricultural lime, enteric fermentation, rice cultivation, manure management, fertilizer use (both synthetic and from manure), and agricultural waste burning in fields. However, the current analysis does not consider large-scale biomass burning from savannah. Estimation of emissions from the agricultural sector relies on activity data obtained from FAOSTAT (2023) and emission factors provided by the IPCC Guidelines (2006b). CH_4 emission factors for enteric fermentation in both dairy and non-dairy cattle have been updated to incorporate the IPCC 2006 Tier 2 methodology. Agriculture related emissions are extended up to 2022 making use of crop and livestock specific data at macro regional level from USDA (2023).

Fluorinated gases (F-gases): EDGARv8.0 includes, among other substances, the fluorinated gases (F-gases), a class of man-made chemicals used in a wide range of industrial applications. F-gases play an important role in some key sectors of the economy, such as the production of magnesium and aluminium or the semiconductor manufacturing. F-gases represent a set of powerful greenhouse gases which is significantly contributing to climate change. F-gases include three main groups: (1) Hydrofluorocarbons (HFCs) mainly used as refrigerants, blowing agents for foams and solvents; (2) Perfluorocarbons (PFCs) used in the electronics sector (3) sulphur hexafluoride (SF_6) used mainly as insulating gas, in high voltage switchgear and in the production of magnesium and aluminium (refer to Table 4). Details on the methodology and data sources used are provided in Olivier et al. (2022).

([44]) https://rcrapublic.epa.gov/rcrainfoweb/action/modules/br/trends/view

Table 4. Overview on F-gases by sector included in EDGARv8.0

General category			PFCs	HFCs
Substances	SF6	NF3	C2F6, C3F8, C4F10, C5F12, C6F14, c-C5F8, CH4	HFC-23, HFC-32, HFC-41, HFC-125, HFC-134, HFC-134a, HFC-143, HFC-143a, HFC-152a, HFC-227ea, HFC-236fa, HFC-245fa, HFC-365mfc, HFC-43-10-mee, HFC-131b, HFC-142b
Industrial processes	Non-Ferrous metal production Chemical industry Electrocnic industry Electrical equipment	Electronic industry	Non-Ferrous metal production Electronic industry PFC use in fire extinguishers other application	Refregeration and air conditioning Fire estingishers Solvents Aerosols foam blowing other application

Source: JRC, 2023

Changes compared to previous editions of the report

The current version of this report includes several updates compared to previous editions which may result in differences in final emission estimates by country and by sectors. The main changes are summarised here below:

- **Updated Global Warming Potential:** According to the 27th Conference of the Parties (COP27) decision, all Parties must use Global Warming Potential (GWP-100) value from the IPCC's Fifth Assessment Report for their emission reporting under the United Nations Framework Convention on Climate Change (UNFCCC) and under the Paris Agreement. Therefore, we adopted the IPCC GWP-100 AR5 metrics[45] to compute total GHG emissions in CO_{2eq} instead of the previously used AR4 values. Overall, global GHG emissions expressed in CO_{2eq} using the AR5 GWP-100 values are 2.3% higher than those obtained using the AR4 metrics.

- **New sectorial detail:** GHG emissions are provided with higher sectoral detail, in particular to disaggregate the previous 'other sector'. Specifically, we included: Power Industry, Industrial combustion, Buildings, Transport, Agriculture, Fuel exploitation, Processes, Waste. In the country fact sheets presented in this booklet, emissions from Industrial combustion and processes are shown in an aggregated sector ('Industrial Combustion and Processes'), while they are provided separately in the underlying data set, available as an Excel spreadsheet.

- **Updated statistics** and data sources are used for all emitting sectors, thus resulting in possible differences with previous estimates.

([45]) https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf, pages 73-79.

Annex 2. Methodology for the estimation of emissions from Land Use, Land-Use Change and Forestry (LULUCF)

The EDGAR-LULUCF component is the third release of a dataset developed by the JRC. Compared to the previous releases, it includes new estimates of emissions and the removals from living biomass in the whole Forest Land sector, therefore including the Forest Land remaining Forest Land category (i.e. managed forest existing from at least 20 years) and the areas converted to forest land in the previous 20 years, covered by the Land converted to Forest Land category. Wild fire emissions are also included in current EDGAR-LULUCF estimates and are based on the Global Wildfire Information System (GWIS) data, as discussed in Annex 3. The net fluxes from the other land use categories, namely Deforestation (the Forest Land converted to Other Land category), Organic Soils, and the remaining categories and pools grouped under the "Other" term, are derived from a dataset based on the official country GHG reports submitted to UNFCCC (see Grassi et al. 2022). The resulting dataset is largely complete on most land uses for developed countries, while the GHG reports from several developing countries are still rather incomplete (in this case, gap-filling was done to ensure a complete time series, see Grassi et al. 2023).

The dataset for Forest Land living biomass is produced through a geographically explicit global scale implementation of the IPCC Tier 1 approach for Greenhouse Gas Inventories (GHGI), as outlined in the IPCC Guidelines (IPCC, 2006 and 2019 Refinement), that combines activity data (areas of land stable in the different land use categories, and conversions among them) and various default factors and country statistics to estimate separately the carbon removals (gains) and emissions (losses). Tier 1 is the most basic and widely-applicable approach, while Tier 2 requires the use of locally-derived parameters, and Tier 3 involves more advanced modelling. Parties to the UNFCCC are required to use at least Tier 2 when estimating categories and carbon pools most significant for their GHG inventory. Compared to the previous year, the methodology was reviewed and improved, and the parameters and ancillary data used were also reviewed and updated.
The activity data for the gains consist in the areas of the different land use categories, which we assessed by means of one of the most widely used recent spatial land cover datasets, the "Land cover classification gridded maps from 1992 to present derived from satellite observations", part of the Copernicus Climate Change Service (C3S). This dataset guarantees backward compatibility with the ESA Climate Change Initiative (CCI) Land Cover Dataset (ESA, 2017) previously released for the years 1992-2015.

The dataset currently furnishes annual global land cover maps for the period 1992-2020 at approximately 300m spatial resolution at the equator developed harmonizing data from different sensors, such as AVHRR from 1992 to 1999, SPOT-Vegetation from 1998 to 2012, MERIS (2003-2012), PROBA-V and Sentinel-3 OLCI (S3 OLCI) from 2013. Data are released with a two-year delay, meaning that the latest available global map refers at the moment to 2020.
The legend consists of 22 classes which follow the FAO Land Cover Classification System (LCCS). The Land Cover maps were converted to IPCC land use classes by means of a conversion table which considers, for each of the 22 LCCS classes, the shares within the pixel of the different IPCC land use categories (Forest Land-partitioned in broadleaf and needle leaf, Cropland, Grassland, Settlements, Wetlands, and Other Land), based on the definition of each LCCS classes. For each pixel of the map, these shares were then converted to actual land areas belonging to the various IPCC categories used within GHG inventories. An Intact Forest layer (Potapov et al., 2017) was used to distinguish managed from unmanaged forest, assuming intact forests to be a good proxy for unmanaged forests (see Grassi et al. 2021).

The activity data for the losses are the country harvest production statistics (industrial roundwood and fuelwood, partitioned in broadleaf and needle leaf) from the FAOSTAT database. When possible, harvest data were corrected for illegal and informal logging, not registered in official statistics, using estimates from different datasets (see Kleinschmit et al. 2016).
At the EU level, a calibration procedure was applied on the original satellite-derived land use areas to best harmonize the temporal behaviour of the ESA/Copernicus time series with the trajectory of the country GHG inventories, showing an increase in the EU forest cover.

In the Tier 1 approach, activity data are modelled into gains and losses through a series of default emission factors and parameters (forest growth rate, Biomass Conversion and Expansion Factors, wood density, carbon density, root-to-shoot ratio etc.) available for the whole world. The IPCC Guidelines contain tables with default parameters values compiled from existing literature, varying by geographical area (continents) and vegetation

characteristics (broadleaf/needleleaf, naturally growing/planted forest, age class, etc.). In our geographically explicit modelling approach, the appropriate parameters were assigned to each forest type according to vegetation/climate/management characteristics identified through ancillary spatial and statistical datasets such as the FAO-GEZ (Global Ecological Zones dataset, FAO 2013), the FAO Forest Resource Assessment (FRA), etc. Compared to last year, the ancillary data used were updated. The shares for the 0-20, 21-100 and over 100 years old age classes were obtained at the country level from the GFAD 1.1 database (Poulter et al. 2019). The shares of Naturally-growing and Planted were also updated using the latest FAO-FRA. This allowed the partitioning of each pixel area according to vegetation characteristics essential to select the correct parameters in each context, such as the tree type (broadleaf or needle leaf), the type of forest (e.g., Tropical Rainforest, Temperate Continental Forest, etc., from FAO/GEZ), the vegetation characteristics (planted trees or natural grown forest), and the forest age class (less or equal 20 years old, between 21 and 100, and over 100 years old).
The default parameters are obtained from the IPCC Guidelines (2006 and 2019 Refinement), the official reference for the production of national GHG Inventories. These parameters values are compiled from a wide range of literature and present a high degree of heterogeneity among the different continents (also for the same tree species or forest type), reflecting the difficulty of identifying specific parameters which are truly representative for the IPCC forest species/types or climate zone.
Compared to last year, the set of parameters used this year is more solidly grounded in the IPCC Guidelines. The standard IPCC Tier 1 approach considers two forest age classes, 0-20 years old and above 21 years old. From the previous results we found that this approach overestimates the forest gain, as it does not consider the ageing of forests which reduces the carbon absorption capability of trees. Within the standard IPCC framework a 21 years old forest absorbs like a 300 years old forest. An important improvement implemented this year refers therefore to the subdivision of the "above 21 years old" class in two classes, a 21-100 years old class and another one for forests above 100 years old. For these "older" forests, we used the parameters for primary forests furnished by the IPCC Guidelines.

Since land cover areas after 2020 were not available, while 2021 FAOSTAT harvest data were available, 2021 and 2022 gains are assumed to be constant. 2021 losses are produced from the FAOSTAT data, while 2022 harvest data are estimated through an interpolation of the previous 5 years.
The results for Forest Land were evaluated in comparison with the available official country GHG reports, generally produced using more advanced Tiers, as it is the case of Annex I countries. When possible, we compared both the results in terms of emissions and removals, as well as the areas. While for most developed areas (e.g. EU, USA) the match is fairly good for at least part of the time series, the differences observed for some other countries (e.g. Canada, Russia, some African and South-Asian countries) may depend on the assumptions made and methods used by the specific countries. In fact, within their inventories countries can make specific choices based on local characteristics and local expertise that cannot be extrapolated in a dataset like ours and applied at the global level. Also, several countries adopt stock-difference methods which are very different from our gain/loss approach, and in fact we notice the biggest discrepancies between our results and country data where stock difference approaches are implemented.

The Tier 1 estimates presented here are aimed to provide a globally-consistent overview for LULUCF using IPCC official default methodologies. These estimates can provide useful information on areas for which no or little official estimations are available (e.g. several African countries). It is however important to highlight that the EDGAR-LULUCF estimates are expressly not aimed at challenging nor verifying the estimates produced by individual countries, generally made using locally available data and parameters at Tier 2, or advanced Tier 3 modelling approaches.
By definition, each country should use the best locally available data and expertise to produce its inventories, while we are on purpose adopting a global Tier 1 approach, using the best data and parameters available at the global scale, inevitably less precise and reliable.
To date, the database provides georeferenced information on the following items:

1. Land Use Area subdivided by
    a. Tree type: Broadleaf, Needleleaf
    b. Age Class: <=20 years, 21-100 years, >100 years
    c. System: Planted, Naturally growing
2. C GAINS (Removals from the atmosphere) subdivided as the Land use areas above
3. C LOSSES (Emissions in the atmosphere) subdivided by
    a. Plant type: Broadleaf, Needleleaf

Harvest type: Fuelwood, Industrial roundwood.

Annex 3. Methodology for the estimation of emissions from large scale biomass burning

Estimates of atmospheric emissions due to biomass burning have conventionally been derived adopting 'bottom up' inventory-based methods (Seiler & Crutzen, 1980). The IPCC AFOLU guidelines thus estimate the emissions as:

$$L = A \times Mb \times Cf \times Gef \qquad \text{[Equation 1]}$$

where:

L [g] is the quantity of emitted gas or particulate

A [m^2] is the area affected by fire

Mb [$g\ m^{-2}$] is the fuel loading per unit area

Cf [$g\ g^{-1}$] is the combustion factor i.e. the proportion of biomass consumed as a result of fire

Gef [$g\ g^{-1}$] is the emission factor or emission ratio, i.e. the amount of gas released for each gaseous species per unit of biomass load consumed by the fire.

As the methodology developed is based on the IPCC Tier 1 approach for Greenhouse Gas Inventories (GHGI), as outlined in the IPCC Guidelines (IPCC, 2006 and 2019 Refinement), the parameters of equation 1 are typically not available for each pixel, but reference values are used instead, for instance those given in tables 2.4, 2.5 and 2.6 of the IPCC guidelines. Those reference values are stratified by landcover class, and it is convenient to rewrite equation 1 as:

$$L_{lc} = A_{lc} \times Mb_{lc} \times Cf_{lc} \times Gef_{lc} \qquad \text{[Equation 2]}$$

where:

L_{lc} [g] is the quantity of emitted gas or particulate for landcover class *lc*

A_{lc} [m^2] is the total area burned in landcover class *lc*

Mb_{lc}, Cf_{lc} and Gef_{lc} are the fuel load, the combustion factor and the emission factor derived from the IPCC tables for landcover class *lc*.

The total emission over the whole area of interest is the summation of L_{lc} for all the landcover areas:

$$L = \sum L_{lc} \qquad \text{[Equation 3]}$$

The IPCC 2006 AFOLU guidelines contain tables for biomass consumed as a function of the landcover, but the vegetation types used are not immediately compatible with the legend of any of the current landcover products. To this end, a procedure was developed to combine data on area burned, landcover, JRC climatic characterization and soil classification map, as described in the following.

- **Area burned**

The area burned used is derived from the GlobFire Database developed under the umbrella of the Global Wildfire Information System (GWIS) (Artés et al., 2019). This burned area product is derived from the most recent Collection 6 Moderate Resolution Imaging Spectroradiometer (MODIS) burned area product (MCD64A1), which maps the extent of fire at 500m resolution and the approximate day of burning (Giglio et al., 2018).

- **Landcover**

The Annual International Geosphere-Biosphere Programme (IGBP) classification legend of the global MODIS landcover product MCD12A1 (Friedl & Sulla-Menashe, 2019) was used. The MCD12A1 global land product is part of the standard MODIS suite, and has been produced at annual intervals since the beginning of the mission. The current Collection 6 version has a spatial resolution of 500m, and it is distributed in the same sinusoidal tiled geometry as the MCD64A1 product, allowing for the computation of stratified total area burned A_{lc} in equation 2 without the need for resampling or reprojection. For each pixel, the MCD12A1 product provides a class label assigned following different legends to cover the needs of multiple user communities. The IPCC legend (LC_Type1) was used in the present application.

- **JRC climatic characterisation and soil classification map**

The Climatic Zone and Soil Type raster maps were created by the Joint Research Centre in support of the European Commission guidelines for the calculation of land carbon stocks for the purpose of Annex V to Directive 2009/28/EC. The Climatic Zone layer is defined based on the classification of IPCC (IPCC, 2006b). Soil types are classified according to the World Reference Base (WRB). The raster data layers were resampled and reprojected to the MODIS sinusoidal projection, and tiled into the MODIS geometry, to ensure interoperability with the MODIS MCD64A1 and MCD12A1 products.

The result of the merged approach is a 500 m landcover map, which uses a set of vegetation classes compatible with the IPCC tables. The procedure is fully automatic, and is repeated for every year from 2000 to 2019, to ensure that the statistics are generated using the most appropriate landcover information for the year.

For the period between 1982 to 1999, where MODIS burned area data were not available, images from the Advanced Very High Resolution Radiometer Long Term Data Record burned area product (AVHRR-LTDR) were used. The final burned area product (designated as FireCCILT10) (Otón et al., 2021) estimated BA in a spatial resolution of 0.05° for the period between 1982 and 2017 (excluding 1994, due to input data gaps).

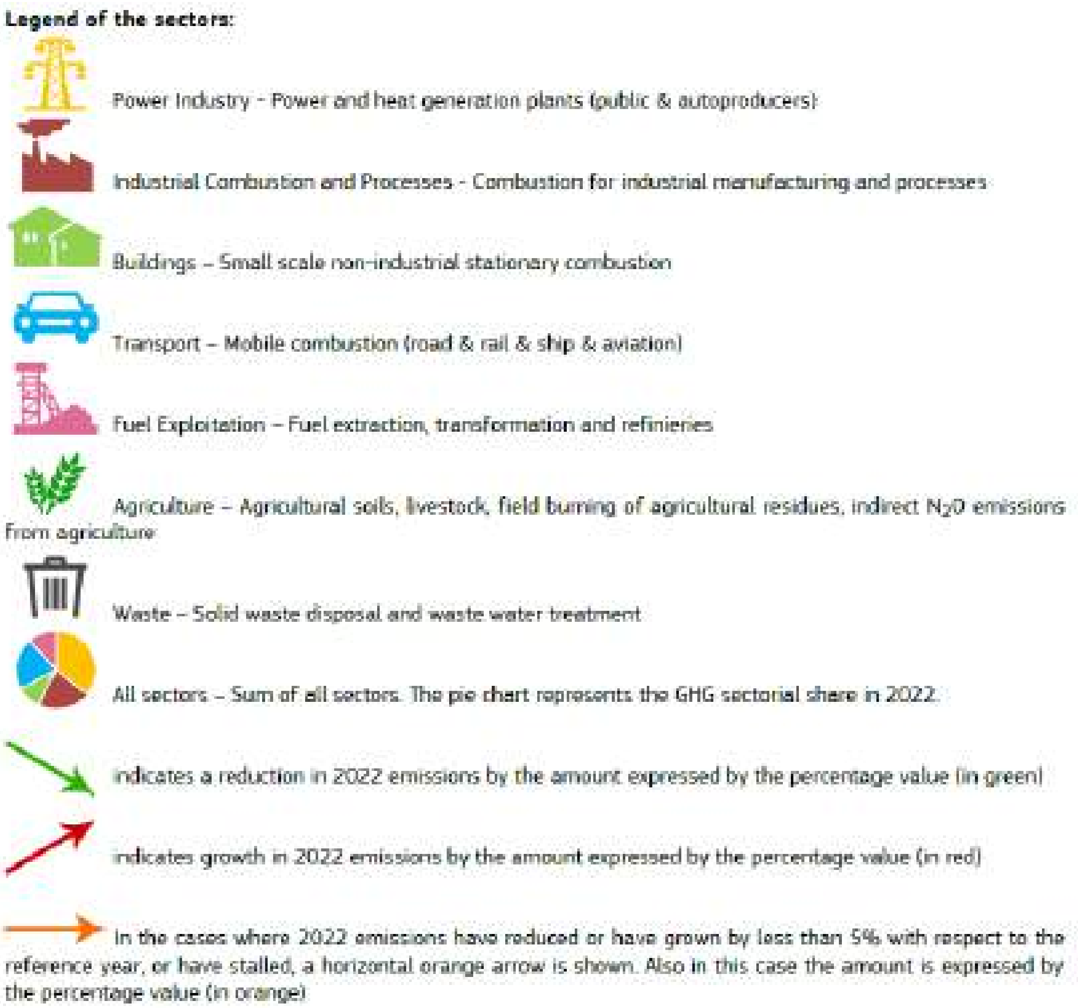
This product is the longest global burned area product currently available, extending almost 20 years back from the existing NASA (MODIS) and European Space Agency (ESA) burned area products. Despite FireCCILT10 and MCD64A1 are based on different sensors and methodologies, Otón et al. (2021) reported high correlation values (r^2 >0.9) between burned area estimations from both with better agreement in tropical regions rather than boreal regions. Spatial trends were found to be similar to existing global burned area products, but temporal trends showed unstable annual variations, most likely linked to the changes in the AVHRR sensor and orbital decays of the NOAA satellites.

The methodology applied for this period was similar to the one developed for the MODIS period (2000-2019), including the resampling and reprojection to the MODIS sinusoidal projection, and tiled into the MODIS geometry, to ensure interoperability with the MCD12A1 products.

Annex 4. Content of country fact-sheets

For each country, a fact sheet is provided with the time series of GHG emissions from all anthropogenic activities except land use, land-use change, forestry and large scale biomass burning. The upper panel of the fact sheet includes GHG annual totals from 1990 until 2022 per sector. A pie chart is also shown representing the share of each individual GHG (fossil CO_2, CH_4, N_2O, F-gases) to the 2022 country total. Then, an overview table with total emissions by country for the years 1990, 2005 (Kyoto Protocol), 2015 (Paris Agreement), and 2022 is also reported, together with per capita, per GDP (PPP constant 2017 international $, USD) emissions, and population data. Along with the summary of the GHG emission time series for each country, a graphical visualisation aids the interpretation of the emission changes by sector over time at the bottom of each page.

The graphs compare GHG emissions for the last available year (2022) with the emission levels of the previous year (2021) and of two key years: 1990 (base year for national greenhouse gases inventory) and 2005, when the Kyoto Protocol came into effect. Emissions stalling, rising or dampening for the year 2022 are expressed in terms of % change with respect to these two years, for sectors specified as follow:



An “n/a” is used to indicate either a sector missing throughout the time series (meaning that no data are reported for that sector) or that no data are available for the reference years or 2022. When computing the emission trend for the sum of all sectors, no value is reported in the case of incomplete statistics for the most emitting sectors for the year 1990 (as for example Greenland).

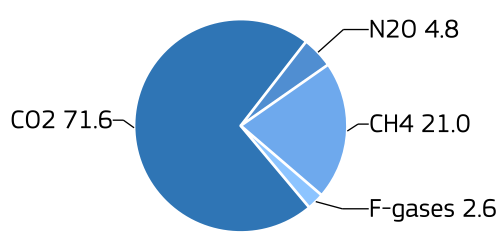
Country-specific GHG emission time series data can be downloaded at the following website: https://edgar.jrc.ec.europa.eu/report_2023.

Annex 5. GHG emissions for the world, international transport and the EU27

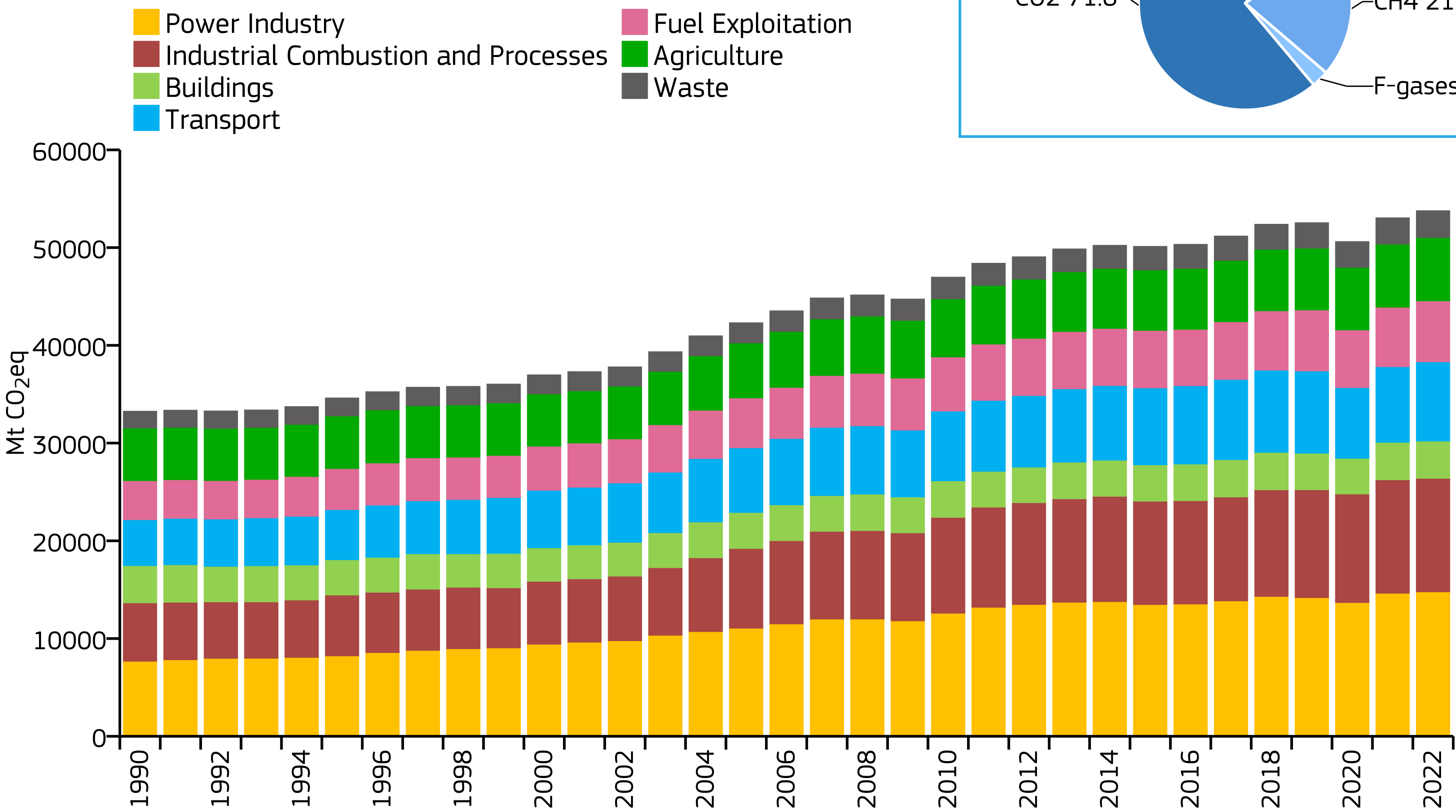
Global totals for all countries, including international shipping and aviation, followed by the international transport sector (shipping and aviation).

Total EU27 emissions from Member States: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

WORLD



GHG emissions by sector

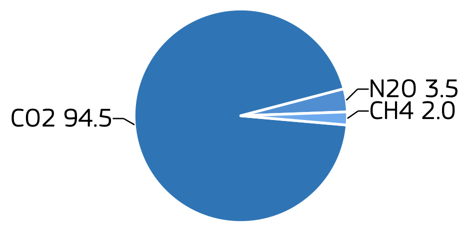


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	53786.039	6.762	0.386	7.954G
2015	50134.384	6.792	0.436	7.381G
2005	42318.428	6.470	0.515	6.540G
1990	33268.121	6.242	0.641	5.330G

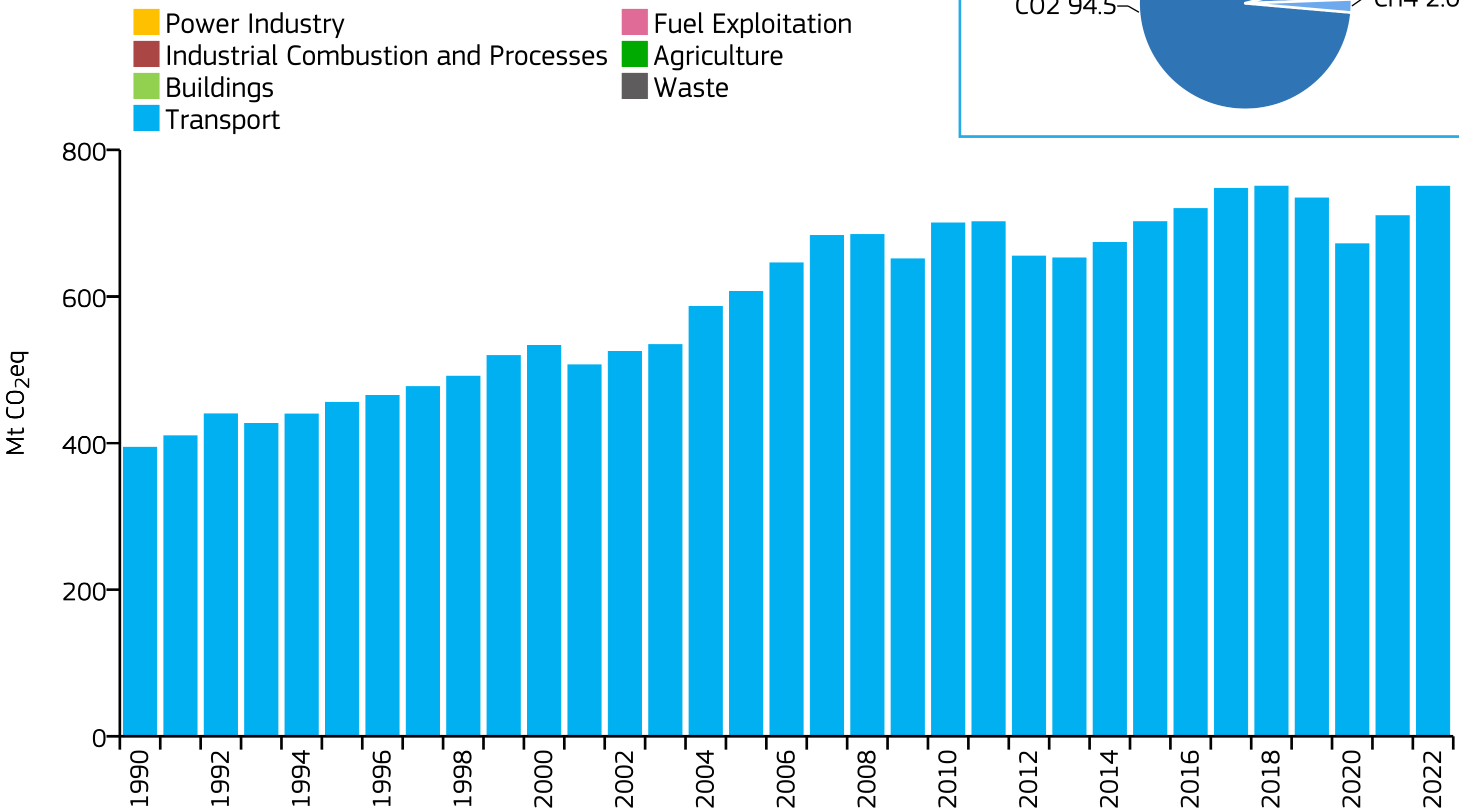
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+92%	+34%	+1%
Industrial Combustion and Processes	+95%	+43%	0%
Buildings	0%	+3%	0%
Transport	+72%	+22%	+5%
Fuel Exploitation	+56%	+22%	+3%
Agriculture	+21%	+15%	+1%
Waste	+58%	+32%	+2%
All sectors	+62%	+27%	+1%

International Shipping

GHG % in 2022



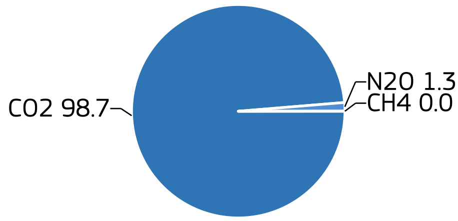
GHG emissions by sector



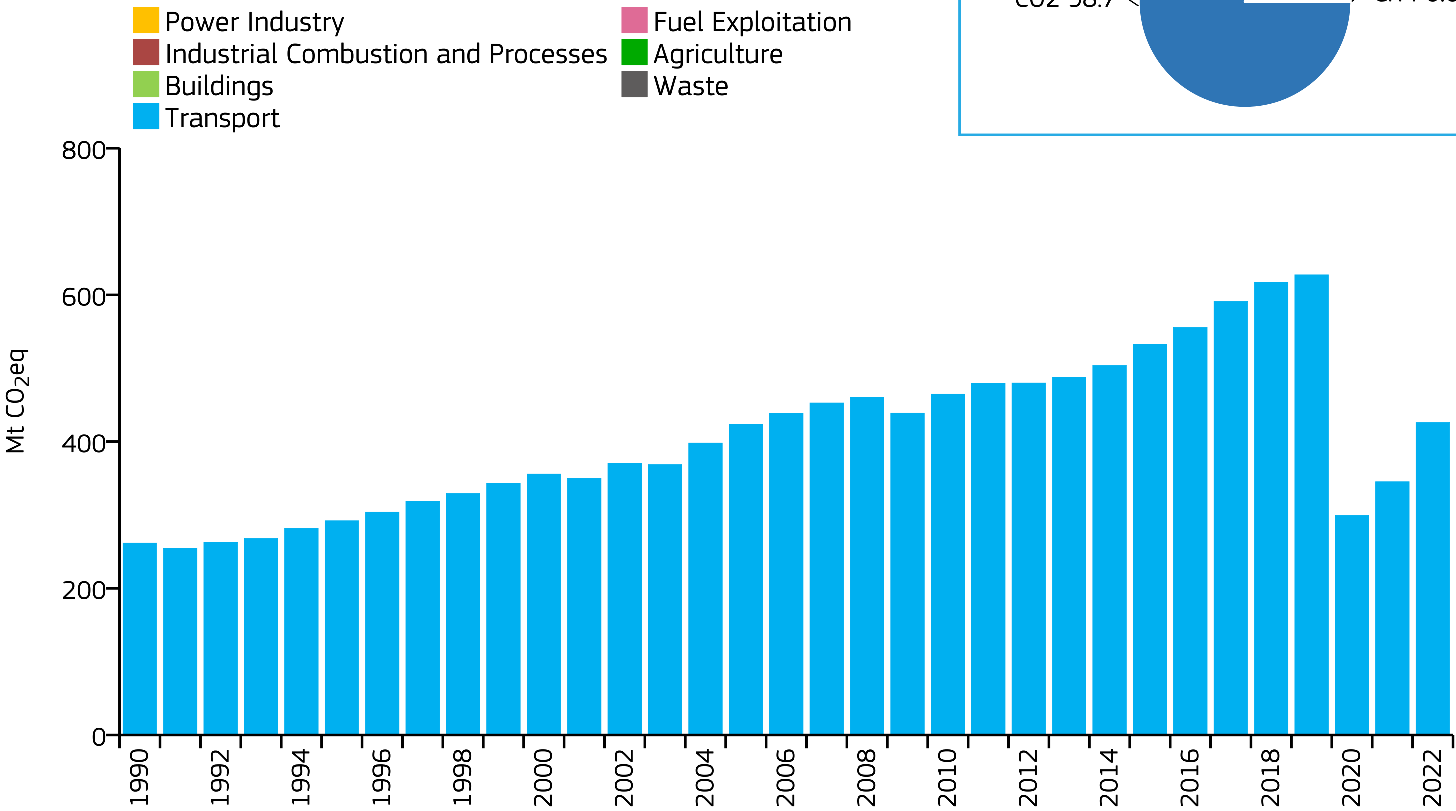
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	750.699	n/a	n/a	n/a
2015	702.303	n/a	n/a	n/a
2005	607.270	n/a	n/a	n/a
1990	394.751	n/a	n/a	n/a

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	**n/a**	**n/a**	**n/a**
Industrial Combustion and Processes	**n/a**	**n/a**	**n/a**
Buildings	**n/a**	**n/a**	**n/a**
Transport	**+90%**	**+24%**	**+6%**
Fuel Exploitation	**n/a**	**n/a**	**n/a**
Agriculture	**n/a**	**n/a**	**n/a**
Waste	**n/a**	**n/a**	**n/a**
All sectors	**n/a**	**n/a**	**n/a**

International Aviation



GHG emissions by sector

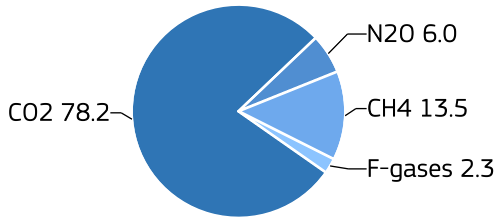


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	425.964	n/a	n/a	n/a
2015	532.878	n/a	n/a	n/a
2005	423.309	n/a	n/a	n/a
1990	261.804	n/a	n/a	n/a

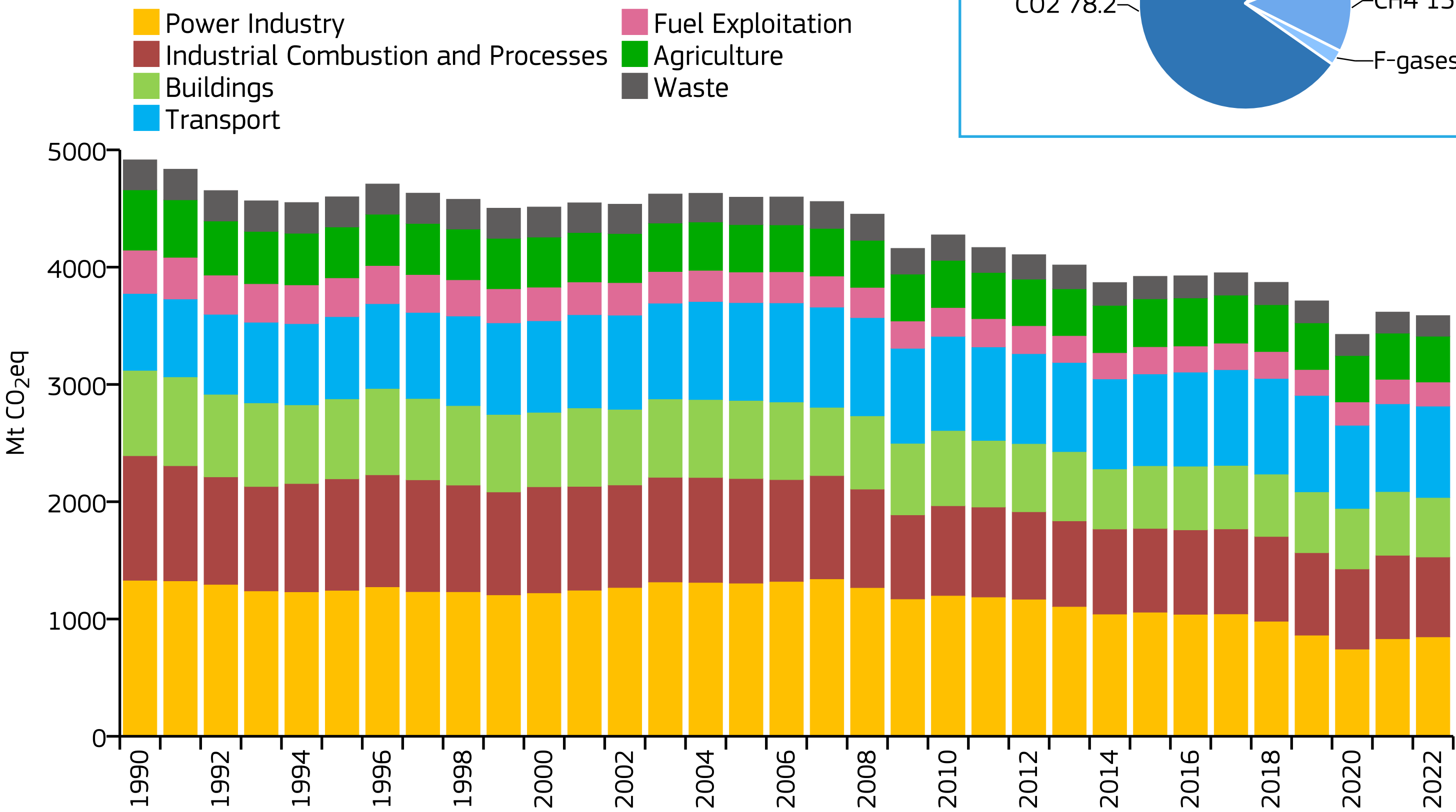
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	**n/a**	**n/a**	**n/a**
Industrial Combustion and Processes	**n/a**	**n/a**	**n/a**
Buildings	**n/a**	**n/a**	**n/a**
Transport	**+63%**	**+1%**	**+23%**
Fuel Exploitation	**n/a**	**n/a**	**n/a**
Agriculture	**n/a**	**n/a**	**n/a**
Waste	**n/a**	**n/a**	**n/a**
All sectors	**n/a**	**n/a**	**n/a**

EU27

GHG % in 2022



GHG emissions by sector



Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3587.796	8.087	0.175	443.641M
2015	3922.022	8.871	0.216	442.095M
2005	4597.105	10.564	0.282	435.163M
1990	4915.144	11.697	0.405	420.198M

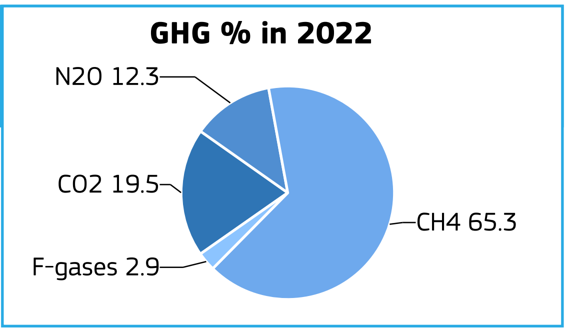
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-36%	-35%	+2%
Industrial Combustion and Processes	-36%	-24%	-4%
Buildings	-30%	-24%	-7%
Transport	+19%	-7%	+4%
Fuel Exploitation	-44%	-21%	-1%
Agriculture	-24%	-3%	-1%
Waste	-31%	-25%	-2%
All sectors	-27%	-22%	-1%

Annex 6: GHG emissions by country

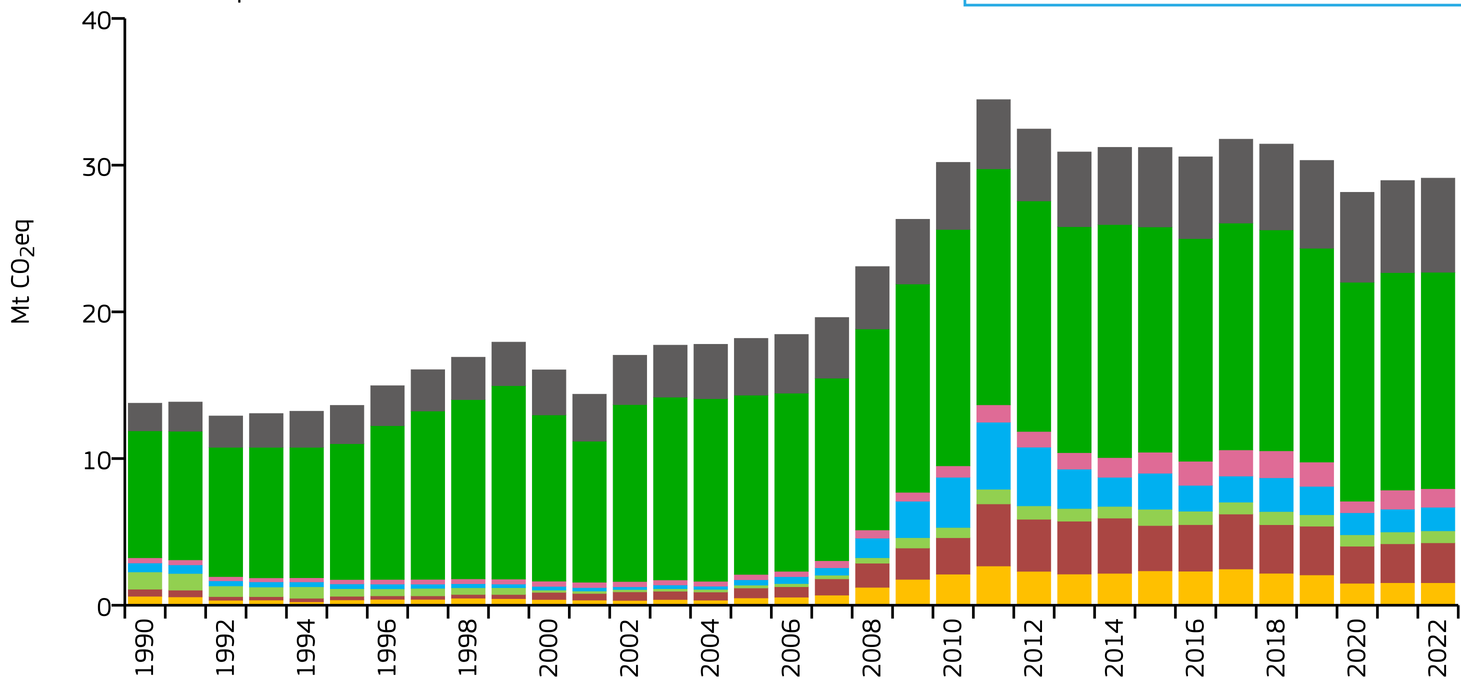
The following countries are presented:

Afghanistan; Albania; Algeria; Angola; Anguilla; Antigua and Barbuda; Argentina; Armenia; Aruba; Australia; Austria; Azerbaijan; Bahamas; Bahrain; Bangladesh; Barbados; Belarus; Belgium; Belize; Benin; Bermuda; Bhutan; Bolivia; Bosnia and Herzegovina; Botswana; Brazil; British Virgin Islands; Brunei; Bulgaria; Burkina Faso; Burundi; Cabo Verde; Cambodia; Cameroon; Canada; Cayman Islands; Central African Republic; Chad; Chile; China; Colombia; Comoros; Congo; Cook Islands; Costa Rica; Côte d'Ivoire; Croatia; Cuba; Curaçao; Cyprus; Czechia; Democratic Republic of the Congo; Denmark; Djibouti; Dominica; Dominican Republic; Ecuador; Egypt; El Salvador; Equatorial Guinea; Eritrea; Estonia; Eswatini; Ethiopia; Falkland Islands; Faroes; Fiji; Finland; France and Monaco; French Guiana; French Polynesia; Gabon; Georgia; Germany; Ghana; Gibraltar; Greece; Greenland; Grenada; Guadeloupe; Guatemala; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; Hong Kong; Hungary; Iceland; India; Indonesia; Iran; Iraq; Ireland; Israel and Palestine, State of; Italy, San Marino and the Holy See; Jamaica; Japan; Jordan; Kazakhstan; Kenya; Kiribati; Kuwait; Kyrgyzstan; Laos; Latvia; Lebanon; Lesotho; Liberia; Libya; Lithuania; Luxembourg; Macao; Madagascar; Malawi; Malaysia; Maldives; Mali; Malta; Martinique; Mauritania; Mauritius; Mexico; Moldova; Mongolia; Morocco; Mozambique; Myanmar/Burma; Namibia; Nepal; Netherlands; New Caledonia; New Zealand; Nicaragua; Niger; Nigeria; North Korea; North Macedonia; Norway; Oman; Pakistan; Palau; Panama; Papua New Guinea; Paraguay; Peru; Philippines; Poland; Portugal; Puerto Rico; Qatar; Réunion; Romania; Russia; Rwanda; Saint Helena, Ascension and Tristan da Cunha; Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Samoa; São Tomé and Príncipe; Saudi Arabia; Senegal; Serbia and Montenegro; Seychelles; Sierra Leone; Singapore; Slovakia; Slovenia; Solomon Islands; Somalia; South Africa; South Korea; Spain and Andorra; Sri Lanka; Sudan and South Sudan; Suriname; Sweden; Switzerland and Liechtenstein; Syria; Taiwan; Tajikistan; Tanzania; Thailand; The Gambia; Timor-Leste; Togo; Tonga; Trinidad and Tobago; Tunisia; Türkiye; Turkmenistan; Turks and Caicos Islands; Uganda; Ukraine; United Arab Emirates; United Kingdom; United States; Uruguay; Uzbekistan; Vanuatu; Venezuela; Vietnam; Western Sahara; Yemen; Zambia; Zimbabwe.

Afghanistan



GHG emissions by sector

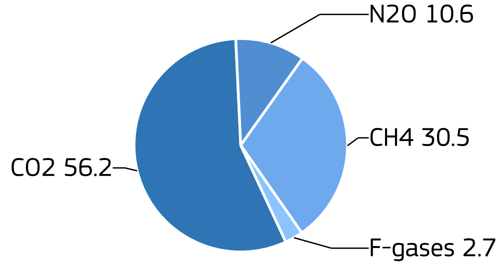


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	29.118	0.732	0.479	39.780M
2015	31.208	0.925	0.438	33.736M
2005	18.191	0.726	0.551	25.071M
1990	13.776	1.125	0.450	12.249M

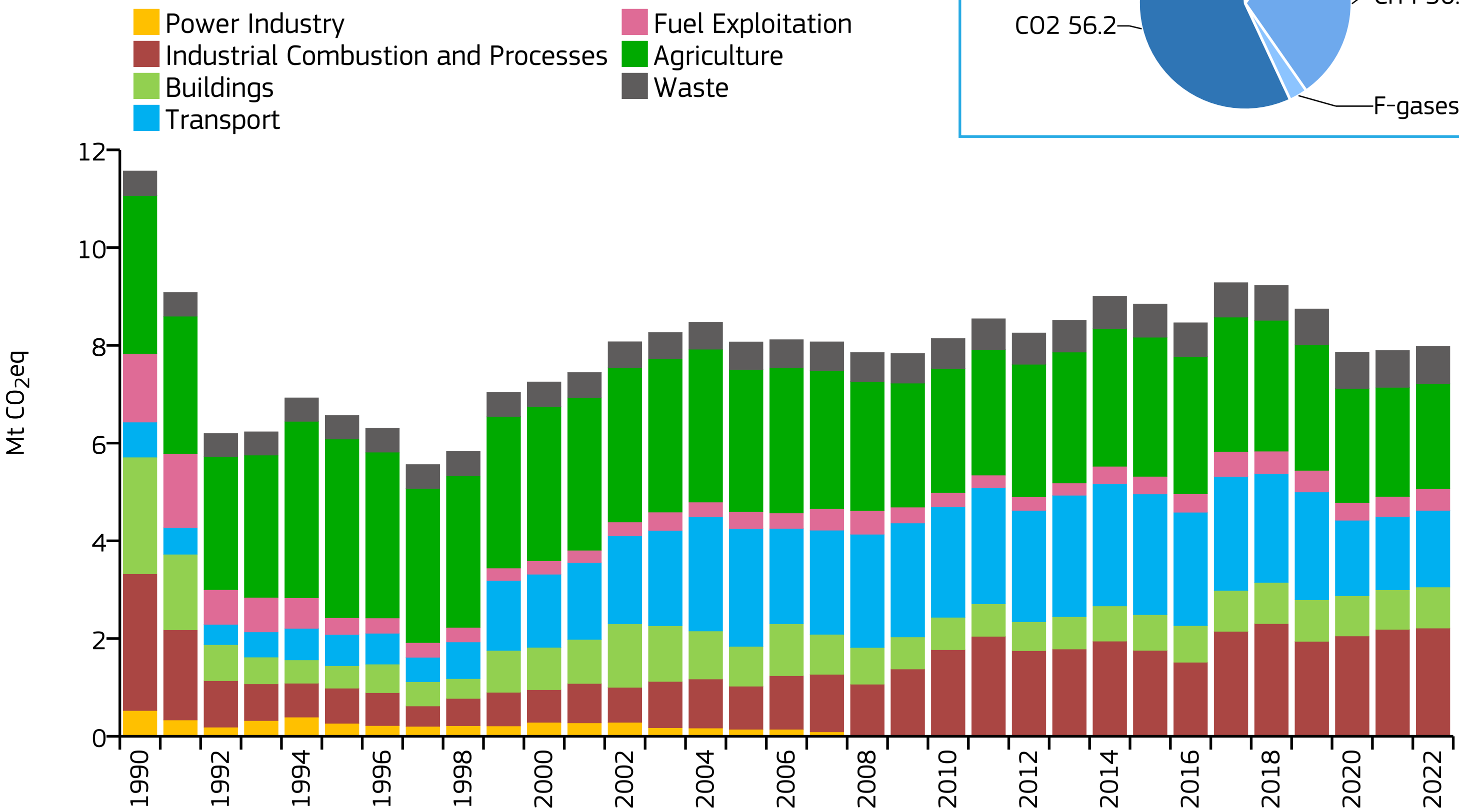
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+153%	+210%	0%
Industrial Combustion and Processes	> +300%	> +300%	+3%
Buildings	-30%	> +300%	+1%
Transport	+163%	> +300%	+3%
Fuel Exploitation	+260%	+248%	-2%
Agriculture	+70%	+21%	-1%
Waste	+240%	+66%	+2%
All sectors	+111%	+60%	+1%

Albania

GHG % in 2022



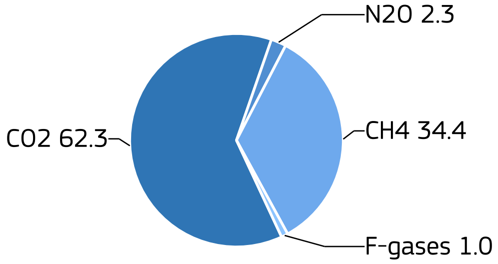
GHG emissions by sector



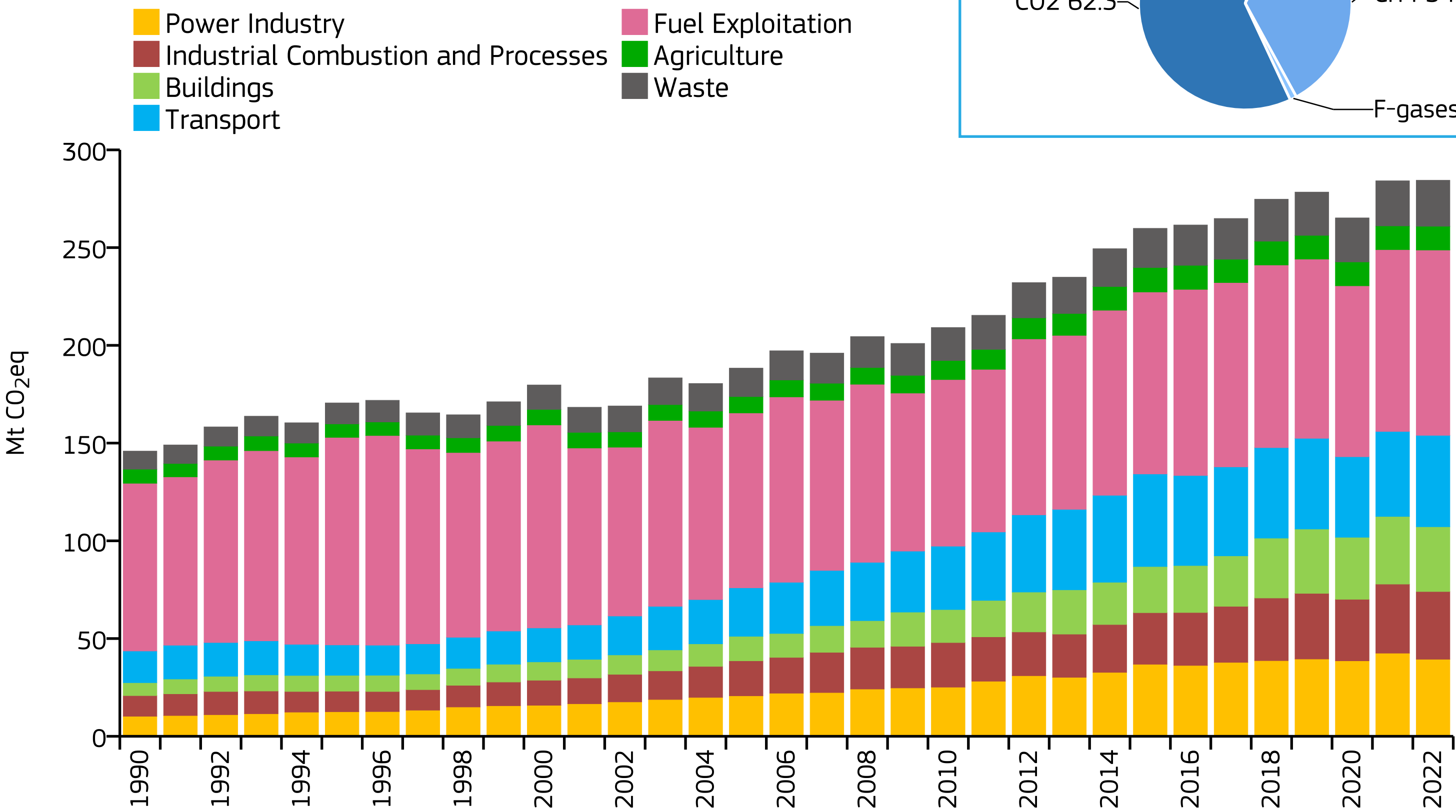
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	7.983	2.709	0.186	2.947M
2015	8.846	3.026	0.259	2.923M
2005	8.070	2.621	0.333	3.079M
1990	11.568	3.525	0.729	3.281M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	n/a	n/a
Industrial Combustion and Processes	-21%	+151%	+1%
Buildings	-65%	+3%	+4%
Transport	+119%	-35%	+5%
Fuel Exploitation	-68%	+27%	+8%
Agriculture	-34%	-26%	-4%
Waste	+53%	+36%	+2%
All sectors	-31%	-1%	+1%

Algeria



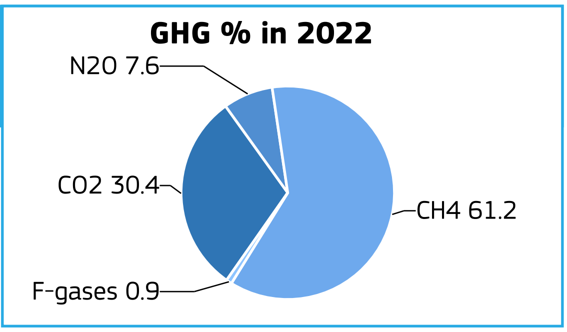
GHG emissions by sector



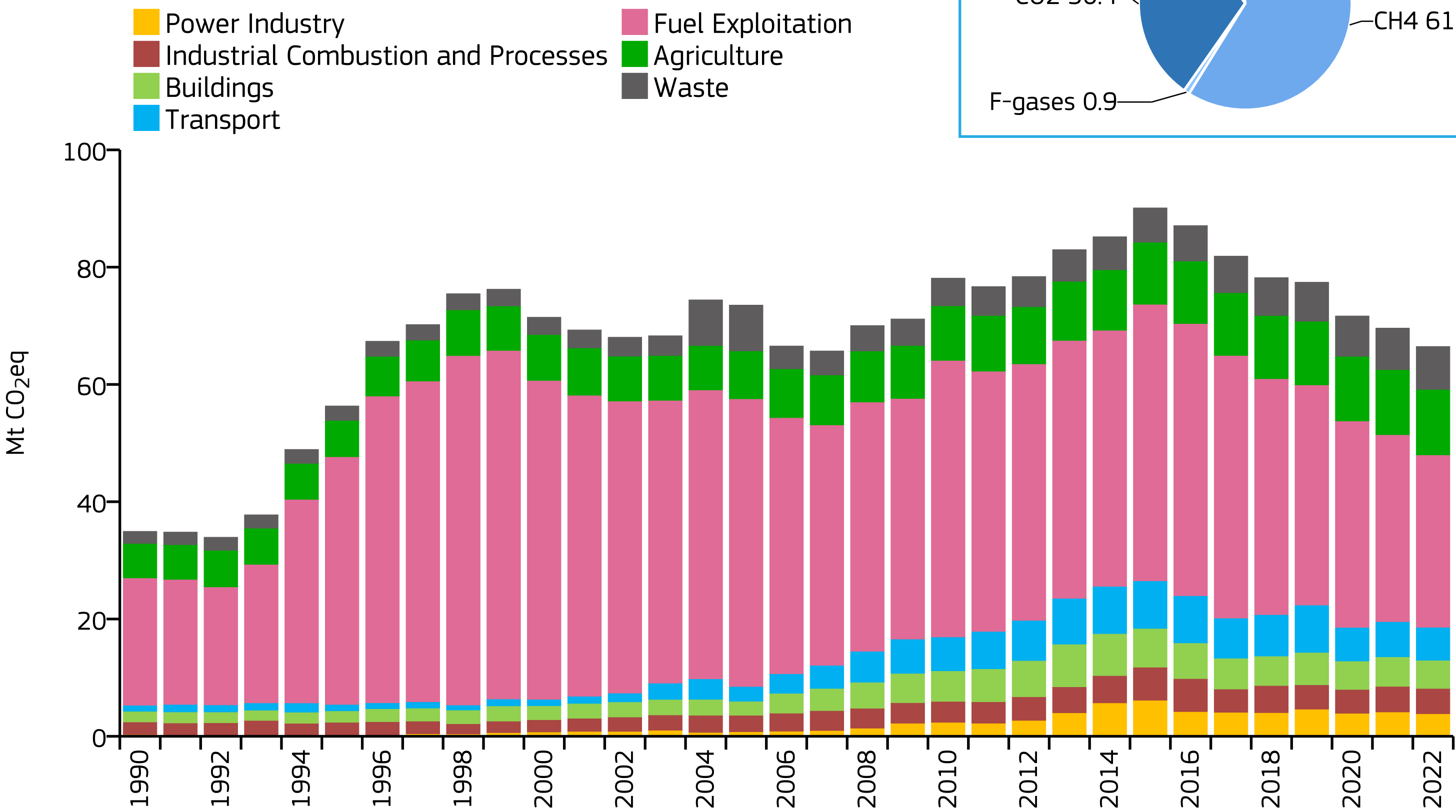
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	284.445	6.380	0.566	44.585M
2015	259.852	6.517	0.559	39.871M
2005	188.338	5.658	0.541	33.288M
1990	145.887	5.630	0.648	25.912M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+285%	+90%	-7%
Industrial Combustion and Processes	+228%	+93%	-2%
Buildings	> +300%	+164%	-4%
Transport	+189%	+89%	+8%
Fuel Exploitation	+10%	+6%	+2%
Agriculture	+69%	+45%	0%
Waste	+155%	+61%	+2%
All sectors	+95%	+51%	0%

Angola



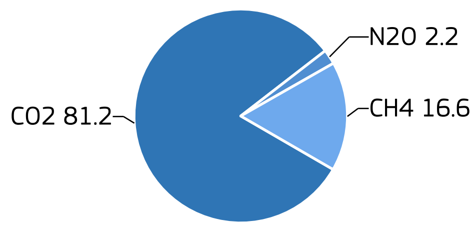
GHG emissions by sector



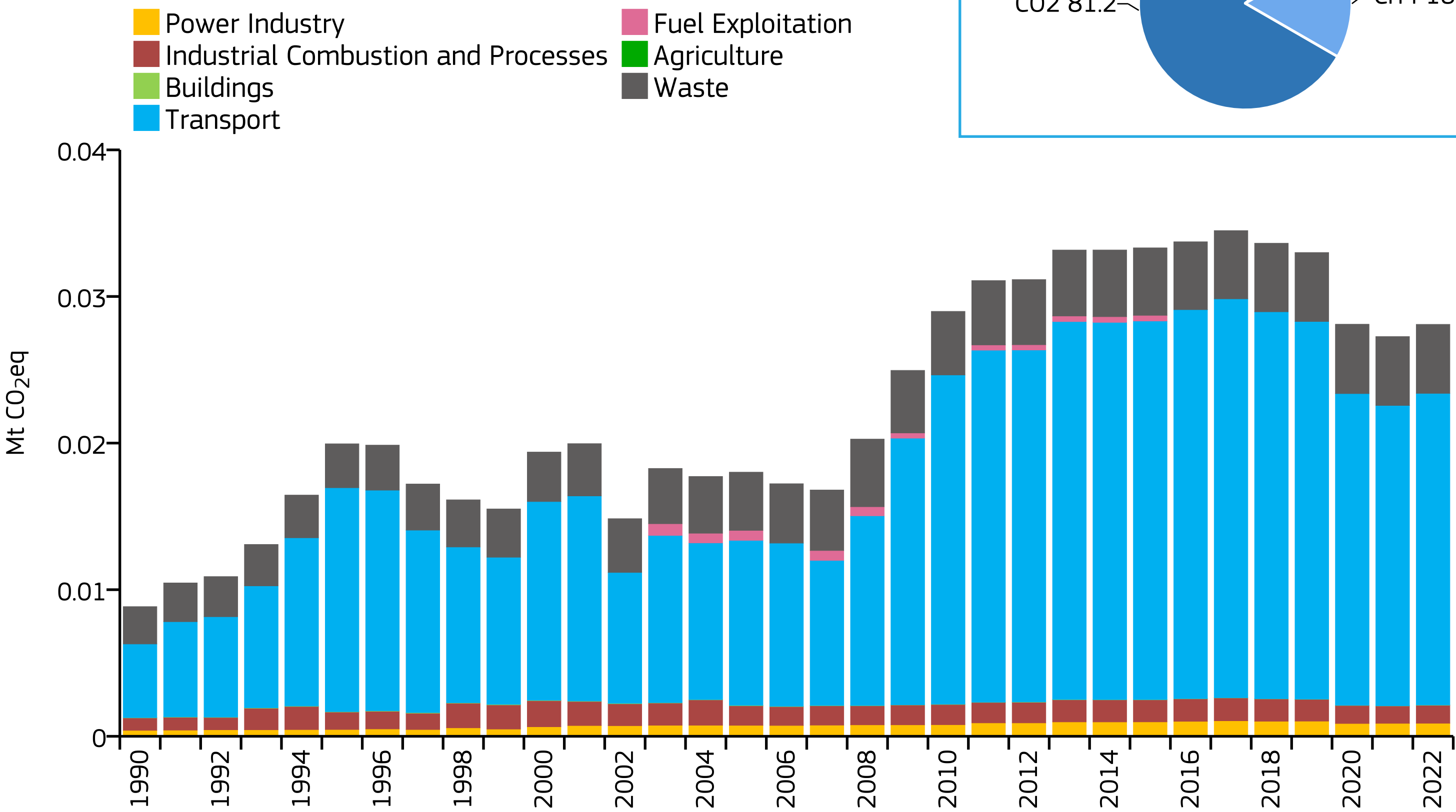
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	66.480	1.900	0.316	34.988M
2015	90.111	3.234	0.402	27.859M
2005	73.534	3.761	0.609	19.552M
1990	34.957	2.872	0.510	12.171M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-7%
Industrial Combustion and Processes	+101%	+53%	-1%
Buildings	+163%	+101%	-4%
Transport	> +300%	+124%	-6%
Fuel Exploitation	+35%	-40%	-8%
Agriculture	+90%	+37%	+1%
Waste	+252%	-6%	+3%
All sectors	+90%	-10%	-5%

Anguilla



GHG emissions by sector

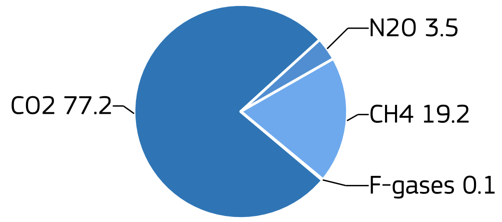


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.028	1.873	0.111	15.000k
2015	0.033	2.280	0.134	14.611k
2005	0.018	1.426	0.041	12.638k
1990	0.009	1.061	0.036	8.334k

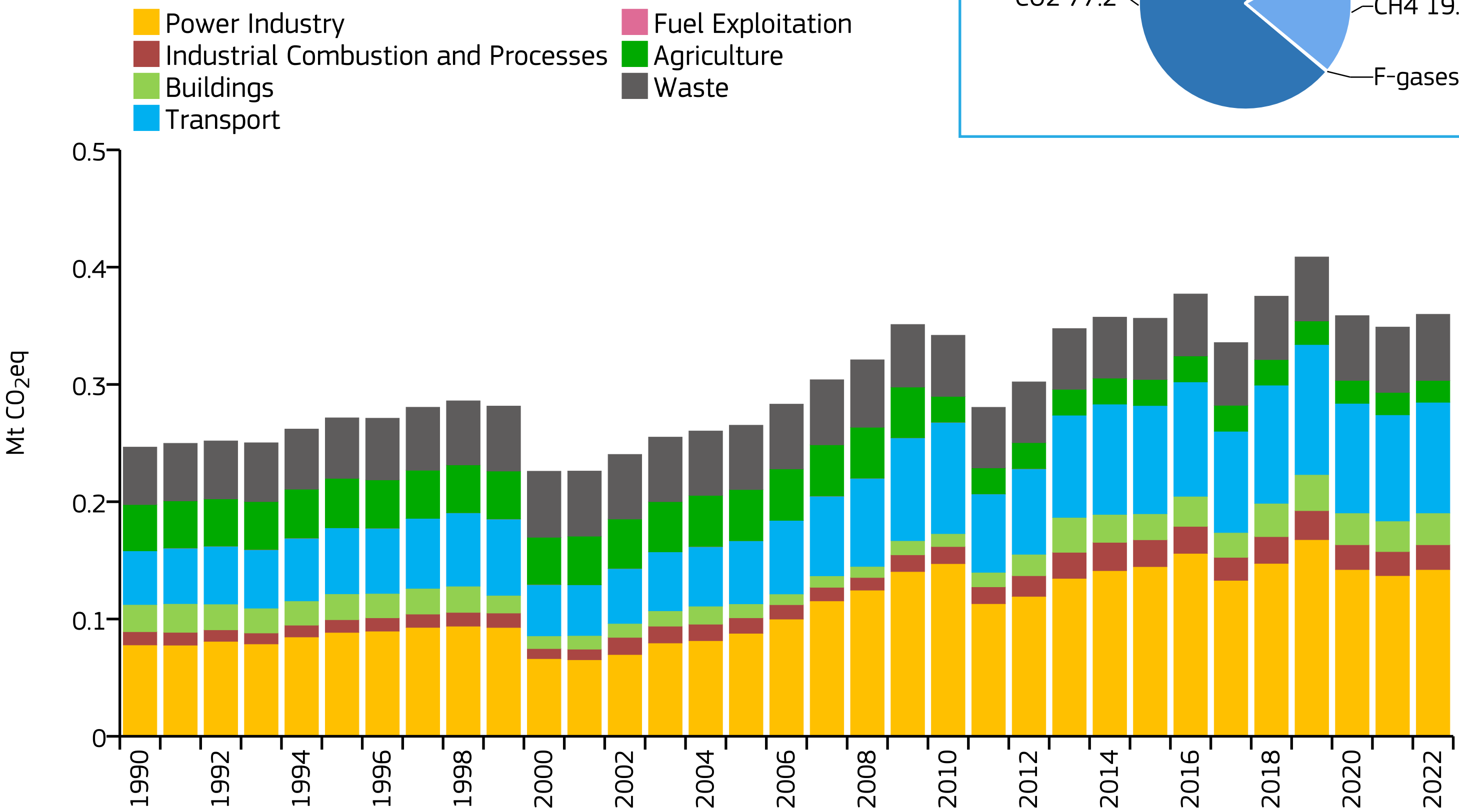
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+121%	+19%	+1%
Industrial Combustion and Processes	+45%	-8%	+4%
Buildings	-40%	-31%	+4%
Transport	> +300%	+89%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+85%	+19%	0%
All sectors	+218%	+56%	+3%

Antigua and Barbuda

GHG % in 2022



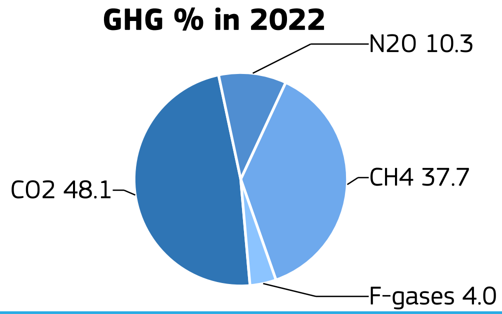
GHG emissions by sector



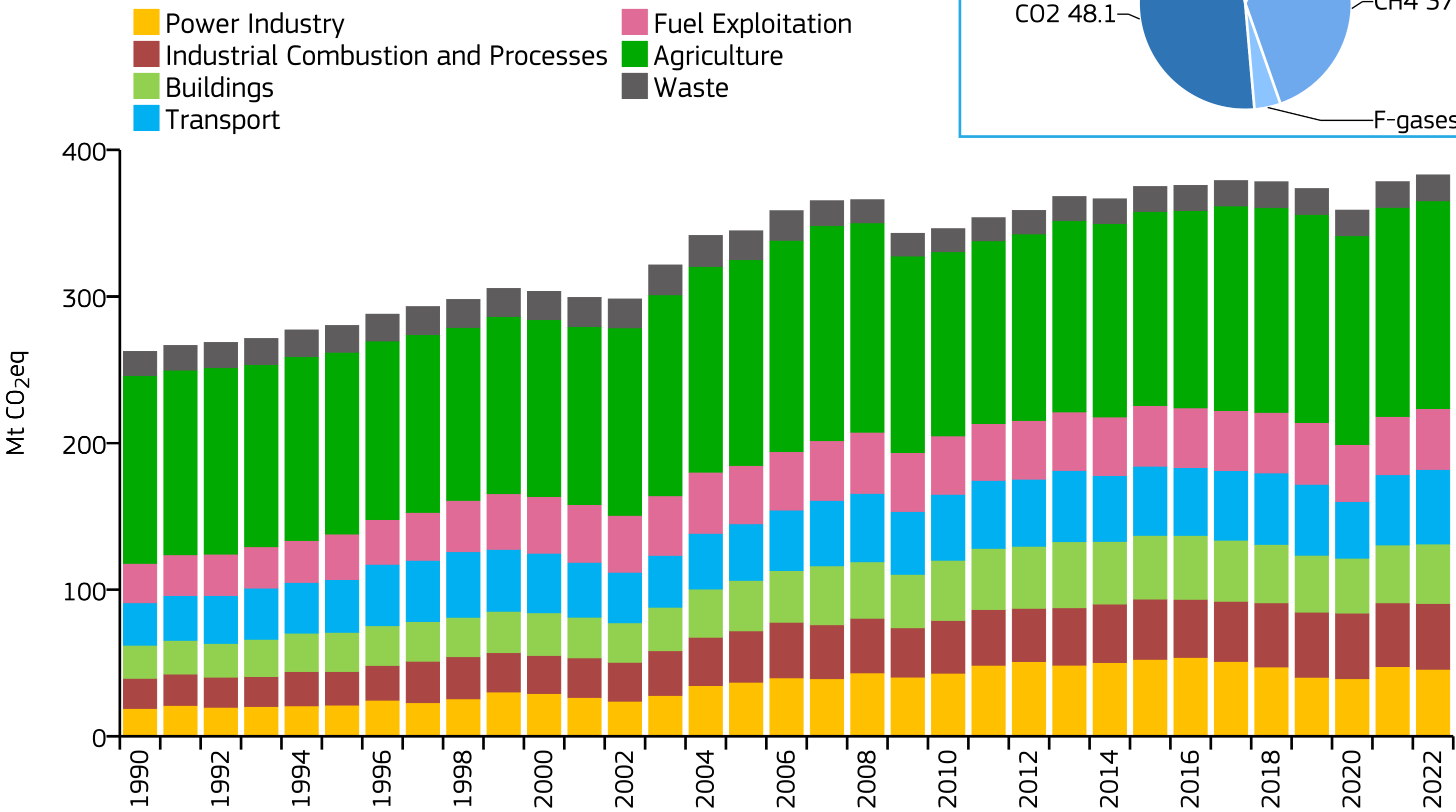
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.360	3.363	0.179	107.000k
2015	0.356	3.567	0.205	99.923k
2005	0.265	2.972	0.165	89.253k
1990	0.247	3.697	0.255	66.696k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+83%	+62%	+4%
Industrial Combustion and Processes	+87%	+60%	+3%
Buildings	+17%	+127%	+4%
Transport	+106%	+76%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	-53%	-57%	-2%
Waste	+15%	+3%	+1%
All sectors	+46%	+36%	+3%

Argentina



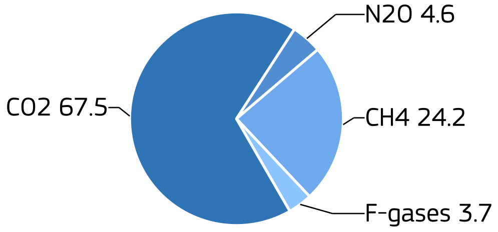
GHG emissions by sector



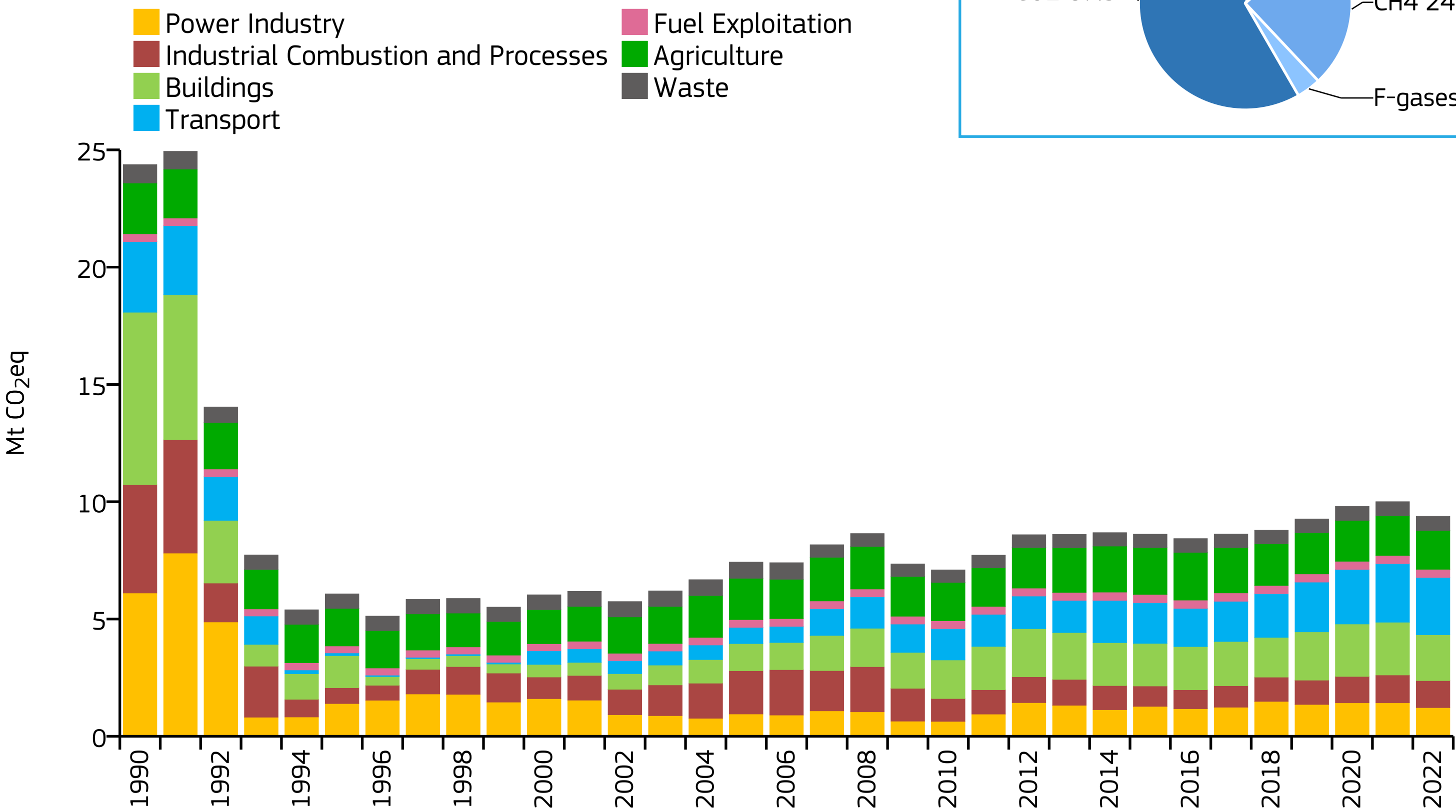
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	382.992	8.269	0.369	46.314M
2015	375.125	8.640	0.363	43.418M
2005	344.827	8.809	0.456	39.145M
1990	262.670	8.025	0.569	32.730M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+142%	+24%	-4%
Industrial Combustion and Processes	+118%	+28%	+3%
Buildings	+79%	+18%	+3%
Transport	+76%	+32%	+6%
Fuel Exploitation	+54%	+4%	+4%
Agriculture	+11%	+1%	-1%
Waste	+7%	-10%	+1%
All sectors	+46%	+11%	+1%

Armenia



GHG emissions by sector

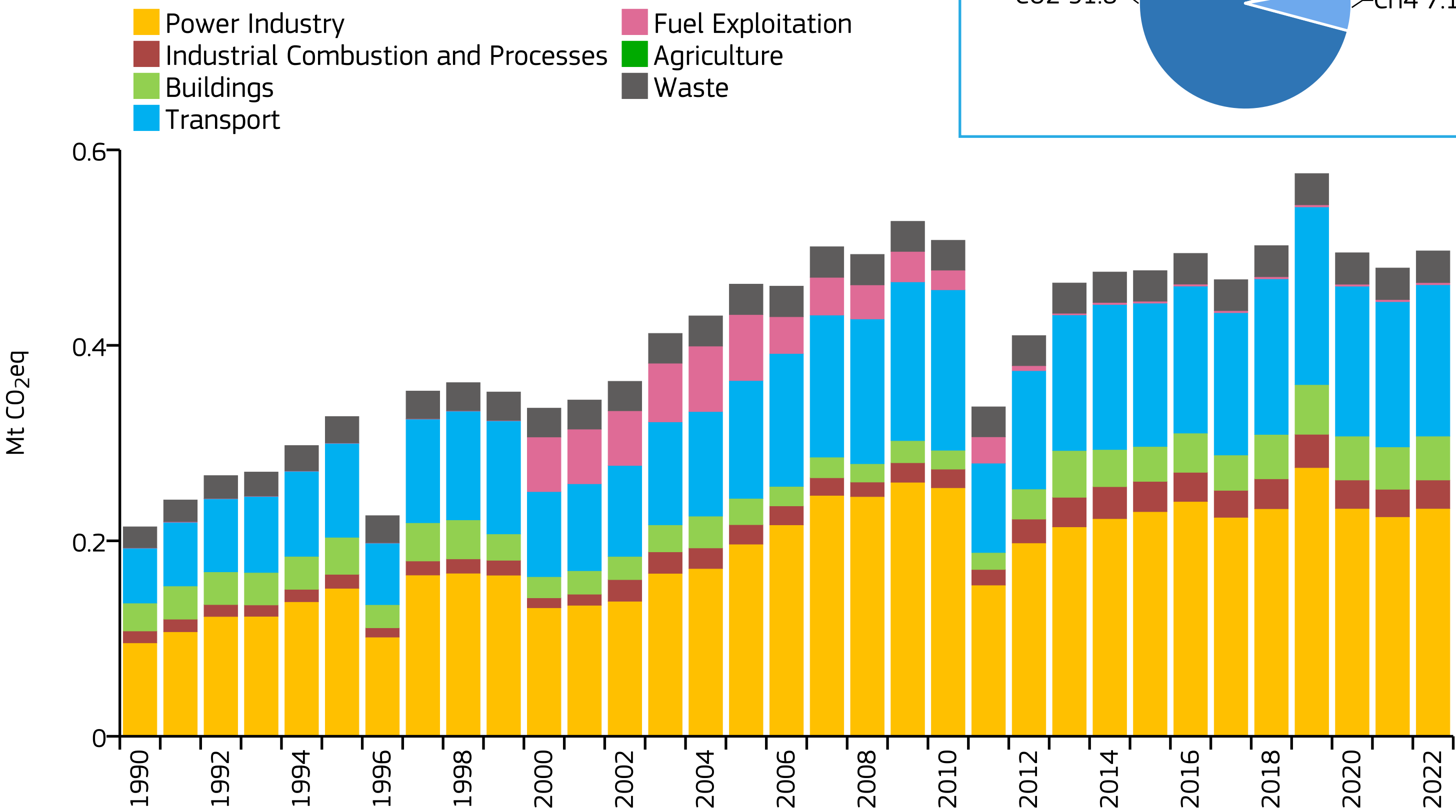


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	9.377	3.189	0.210	2.940M
2015	8.618	2.954	0.260	2.917M
2005	7.430	2.492	0.336	2.981M
1990	24.373	6.889	1.330	3.538M

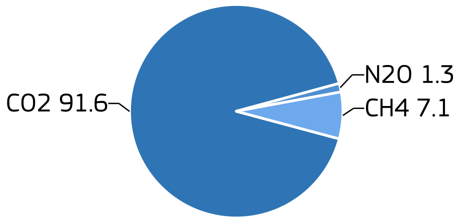
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-80%	+29%	-14%
Industrial Combustion and Processes	-75%	-38%	-3%
Buildings	-73%	+69%	-13%
Transport	-19%	+253%	-2%
Fuel Exploitation	+7%	+7%	0%
Agriculture	-24%	-6%	-2%
Waste	-23%	-13%	+1%
All sectors	-62%	+26%	-6%

Aruba

GHG emissions by sector



GHG % in 2022

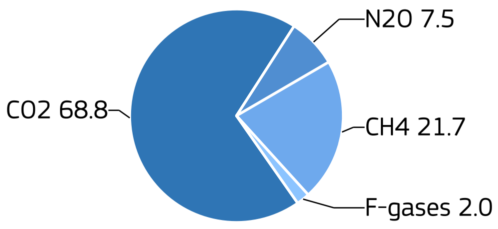


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.497	4.642	0.103	107.000k
2015	0.476	4.566	0.125	104.341k
2005	0.463	4.625	0.125	100.031k
1990	0.214	3.449	0.106	62.149k

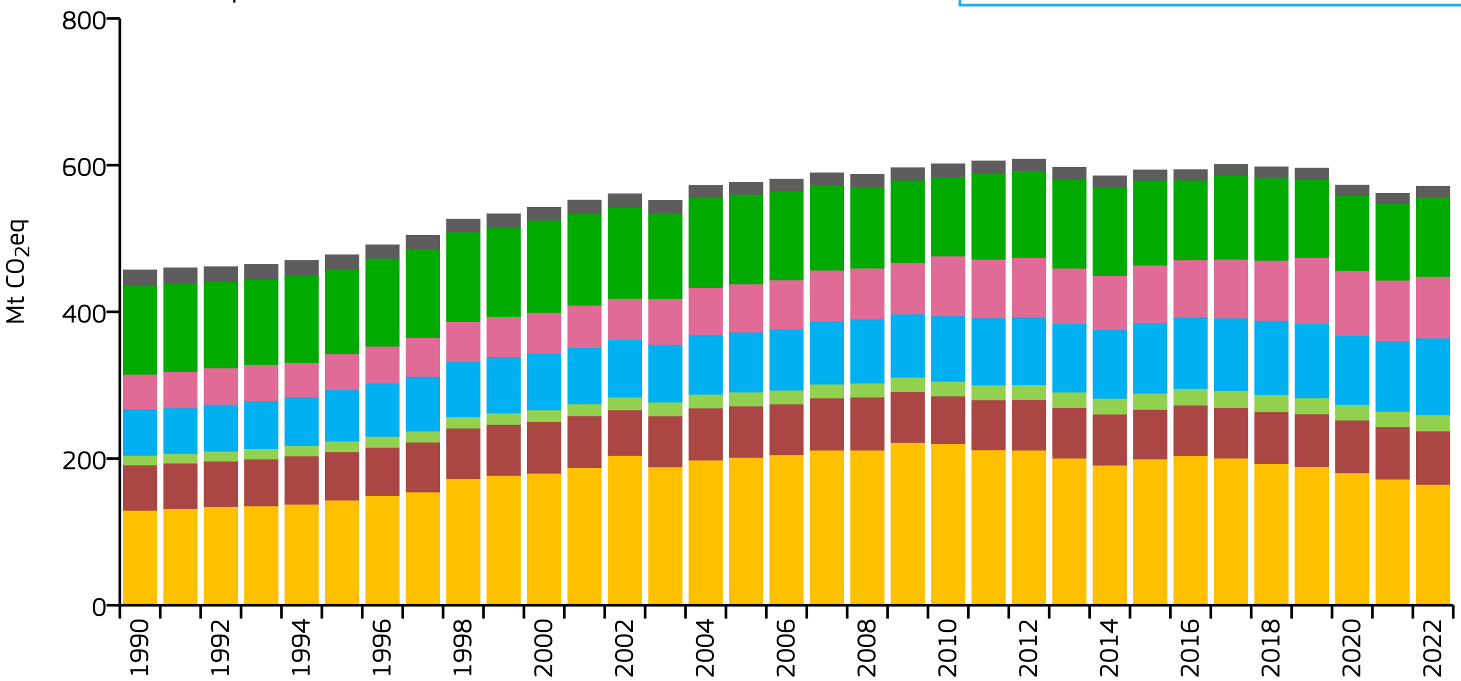
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+144%	+19%	+4%
Industrial Combustion and Processes	+139%	+46%	+3%
Buildings	+57%	+67%	+4%
Transport	+175%	+29%	+4%
Fuel Exploitation	> +300%	-97%	0%
Agriculture	n/a	n/a	n/a
Waste	+52%	+4%	0%
All sectors	+132%	+7%	+4%

Australia

GHG % in 2022



GHG emissions by sector

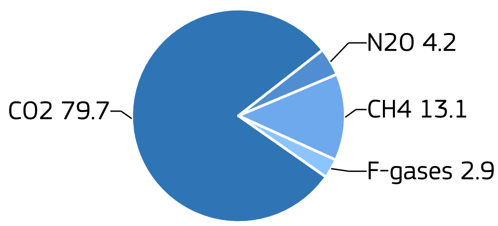


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	571.382	21.979	0.431	25.997M
2015	593.561	24.940	0.524	23.800M
2005	576.590	28.489	0.669	20.239M
1990	457.217	26.830	0.864	17.041M

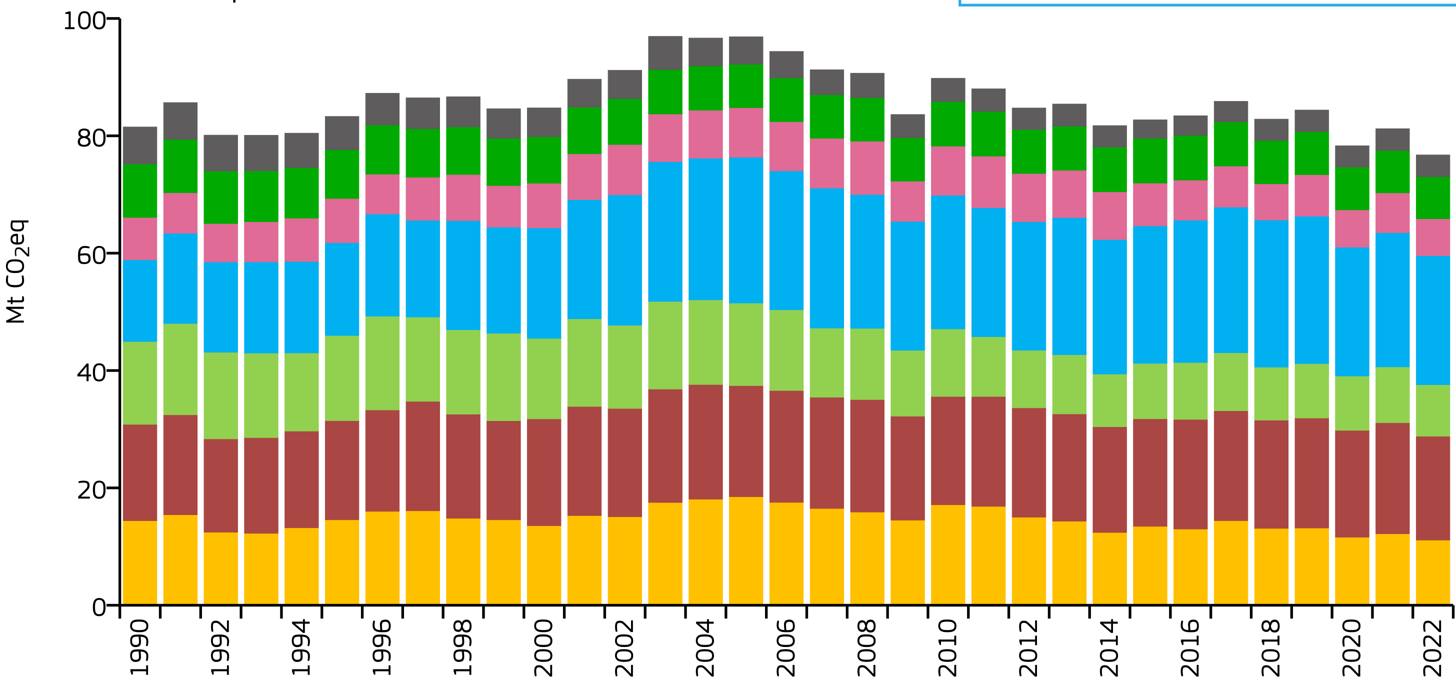
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+27%	-18%	-4%
Industrial Combustion and Processes	+18%	+4%	+2%
Buildings	+69%	+16%	+5%
Transport	+64%	+28%	+9%
Fuel Exploitation	+80%	+28%	+1%
Agriculture	-11%	-11%	+4%
Waste	-31%	-12%	0%
All sectors	+25%	-1%	+2%

Austria

GHG % in 2022



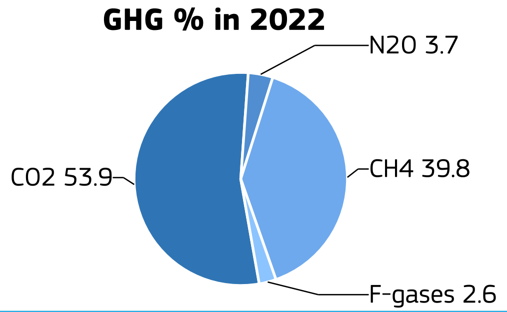
GHG emissions by sector



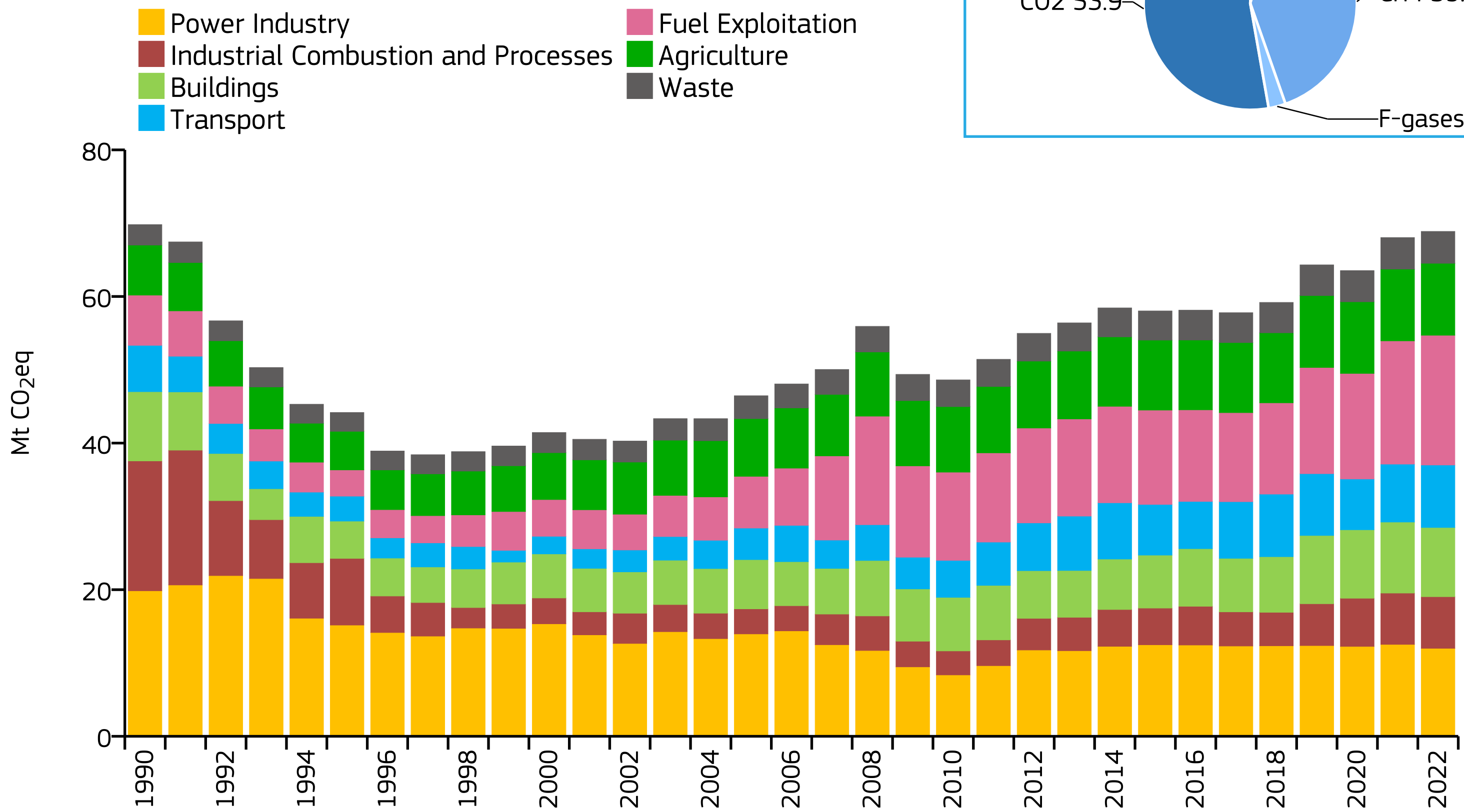
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	76.743	8.700	0.151	8.821M
2015	82.724	9.532	0.181	8.679M
2005	96.878	11.738	0.238	8.254M
1990	81.508	10.553	0.283	7.724M

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-23%	-40%	-9%
Industrial Combustion and Processes	+8%	-7%	-6%
Buildings	-38%	-38%	-8%
Transport	+58%	-11%	-4%
Fuel Exploitation	-13%	-26%	-7%
Agriculture	-21%	-3%	-1%
Waste	-41%	-20%	0%
All sectors	-6%	-21%	-6%

Azerbaijan



GHG emissions by sector

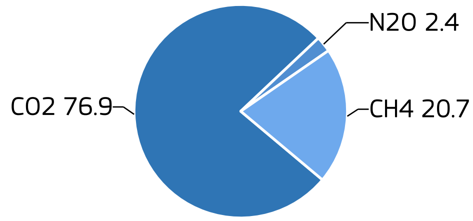


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	68.877	6.718	0.450	10.252M
2015	58.032	6.034	0.405	9.617M
2005	46.459	5.441	0.779	8.539M
1990	69.808	9.638	1.277	7.243M

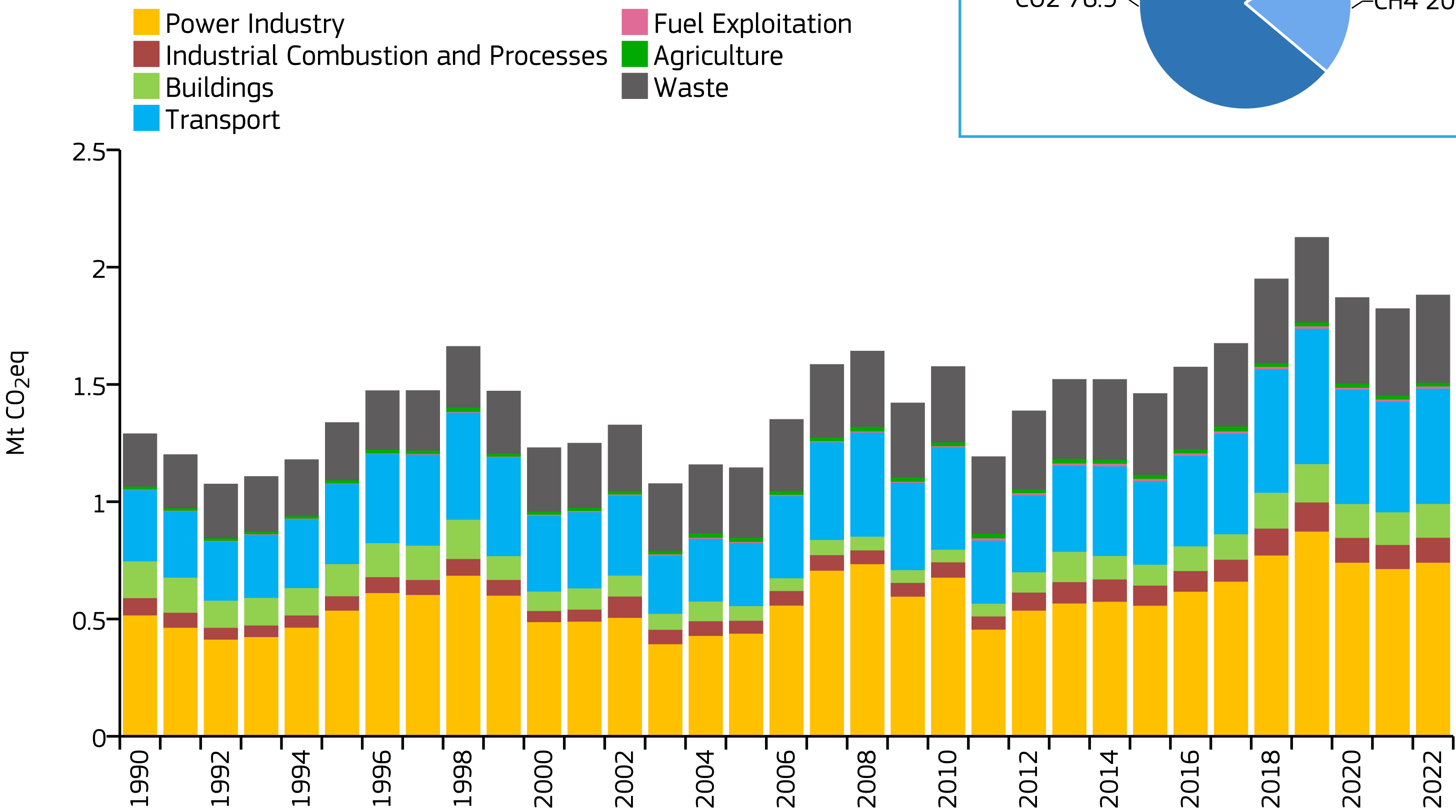
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-40%	-14%	-4%
Industrial Combustion and Processes	-60%	+106%	+1%
Buildings	0%	+40%	-3%
Transport	+35%	+98%	+8%
Fuel Exploitation	+159%	+151%	+5%
Agriculture	+44%	+25%	0%
Waste	+55%	+39%	+1%
All sectors	-1%	+48%	+1%

Bahamas

GHG % in 2022



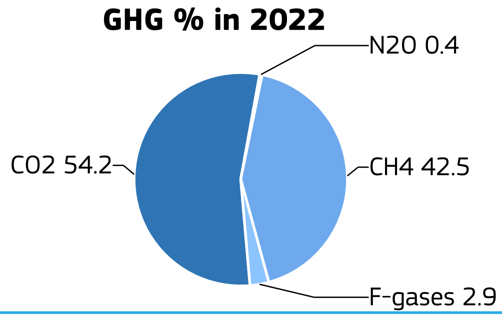
GHG emissions by sector



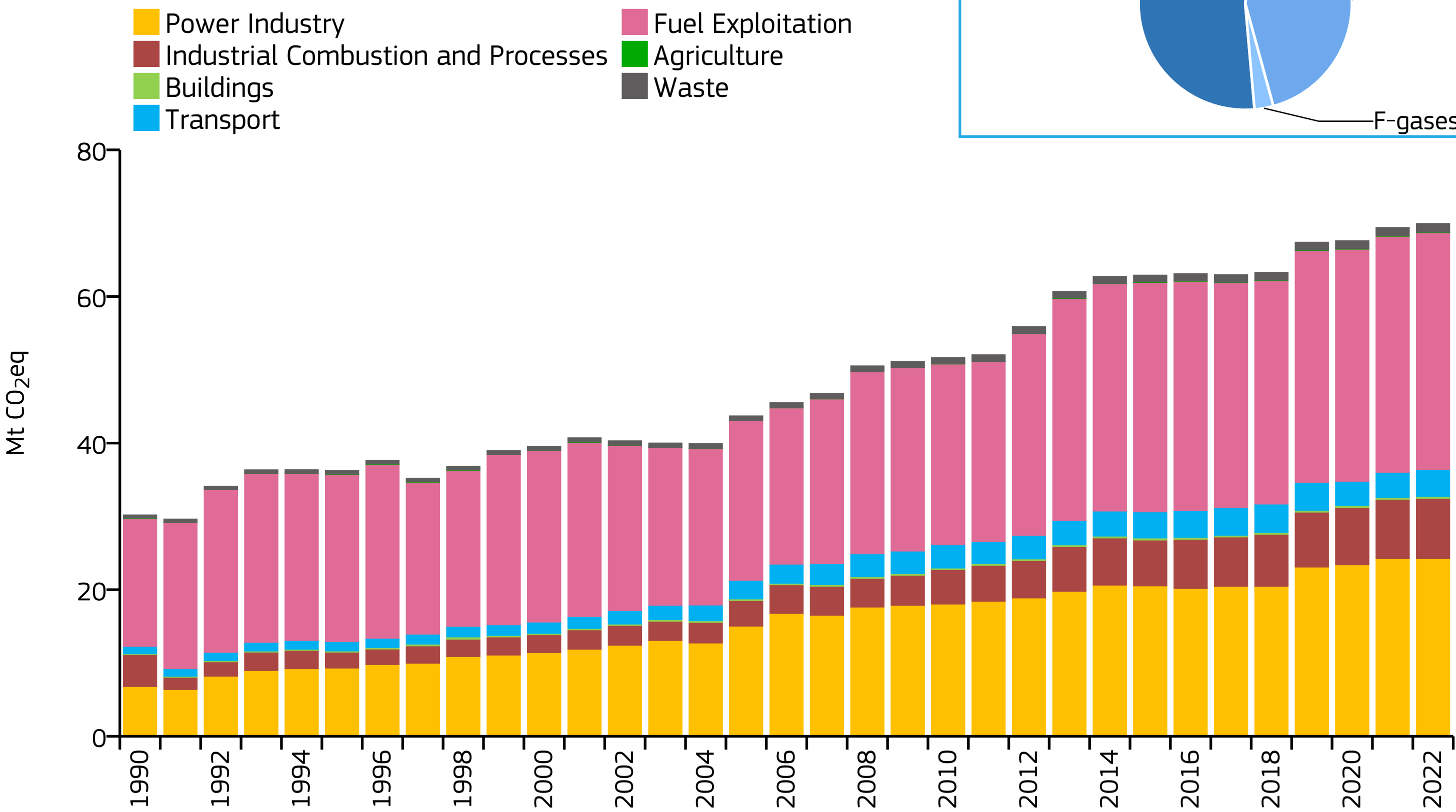
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.882	4.545	0.134	414.000k
2015	1.461	3.778	0.110	386.838k
2005	1.145	3.478	0.088	329.249k
1990	1.290	5.032	0.134	256.336k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+43%	+69%	+4%
Industrial Combustion and Processes	+44%	+92%	+4%
Buildings	-8%	+130%	+4%
Transport	+62%	+83%	+4%
Fuel Exploitation	+225%	+73%	0%
Agriculture	+29%	-9%	-6%
Waste	+66%	+25%	+1%
All sectors	+46%	+64%	+3%

Bahrain



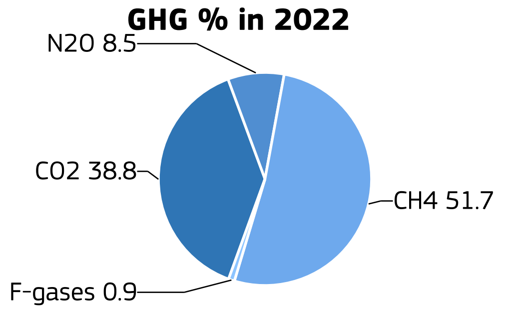
GHG emissions by sector



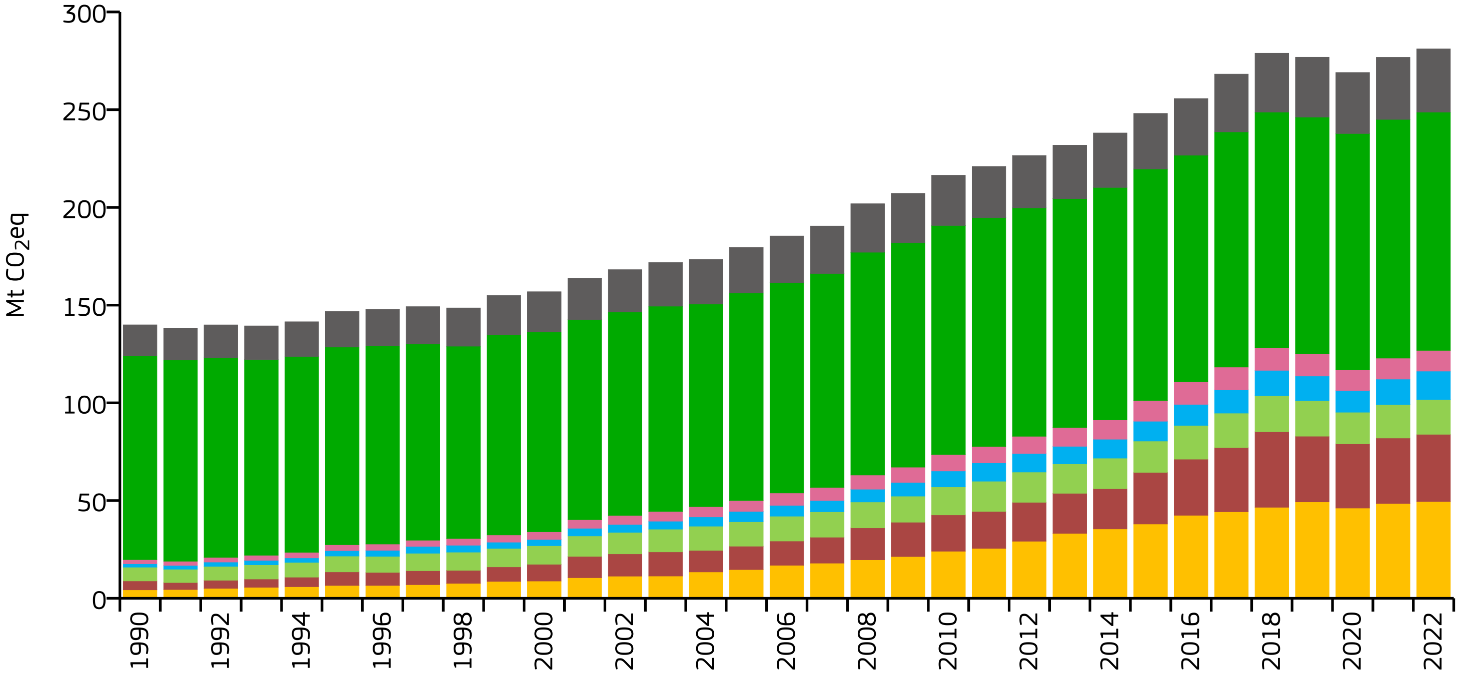
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	69.976	39.290	0.917	1.781M
2015	62.937	45.877	0.954	1.372M
2005	43.733	49.184	1.036	889.168k
1990	30.224	60.944	1.579	495.931k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+258%	+61%	0%
Industrial Combustion and Processes	+90%	+137%	+2%
Buildings	+114%	+14%	+5%
Transport	+263%	+45%	+6%
Fuel Exploitation	+85%	+49%	0%
Agriculture	+52%	+62%	+5%
Waste	+161%	+78%	+3%
All sectors	+132%	+60%	+1%

Bangladesh



GHG emissions by sector

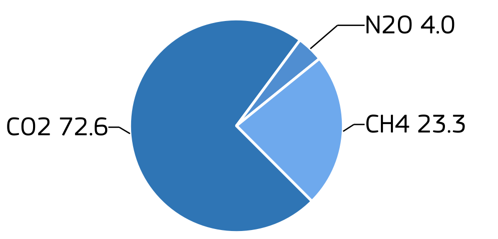


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	281.082	1.623	0.262	173.229M
2015	248.088	1.539	0.362	161.201M
2005	179.555	1.252	0.478	143.431M
1990	139.913	1.318	0.755	106.189M

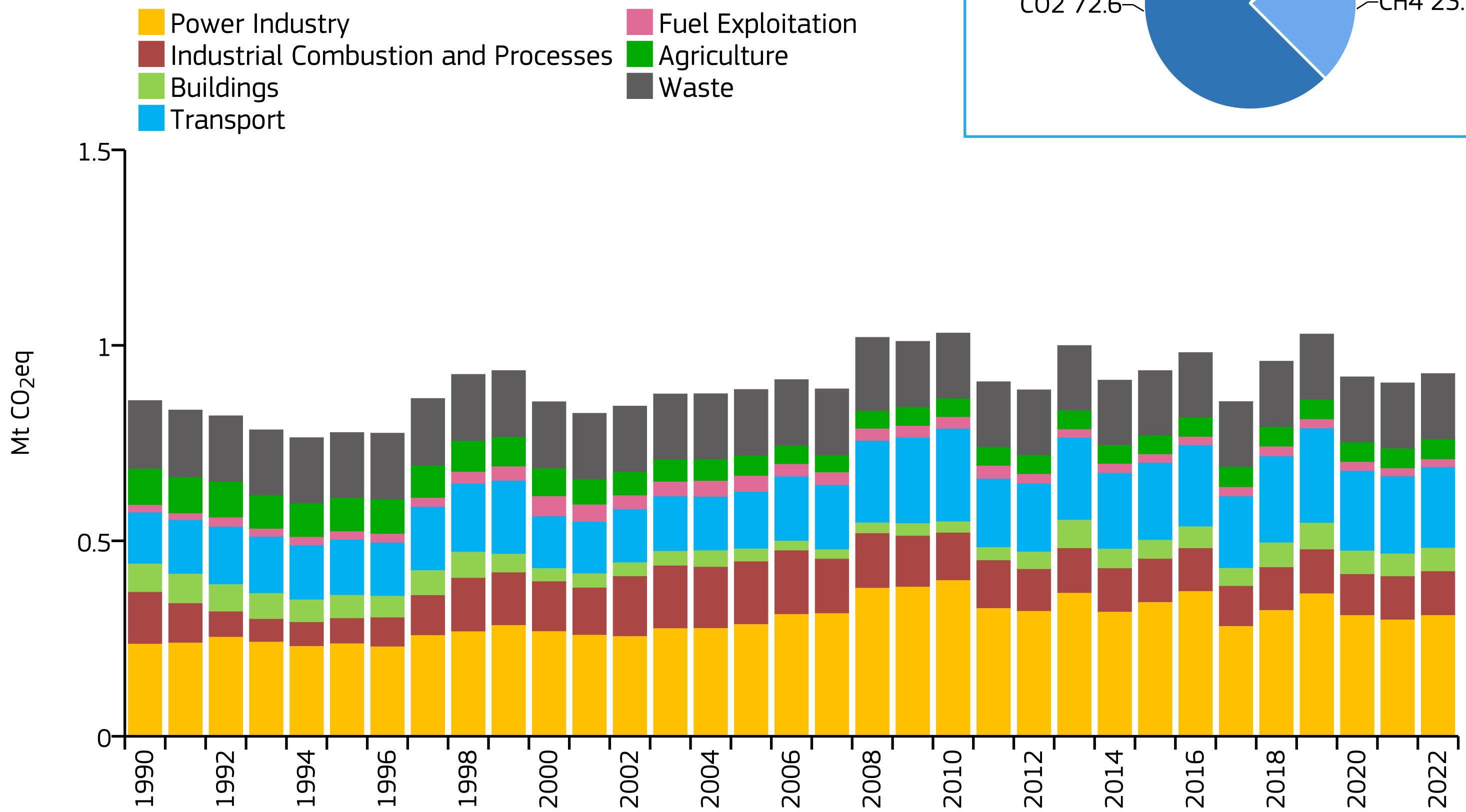
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+237%	+2%
Industrial Combustion and Processes	> +300%	+187%	+3%
Buildings	+151%	+42%	+3%
Transport	> +300%	+177%	+13%
Fuel Exploitation	> +300%	+91%	-1%
Agriculture	+17%	+15%	0%
Waste	+103%	+39%	+2%
All sectors	+101%	+57%	+2%

Barbados

GHG % in 2022



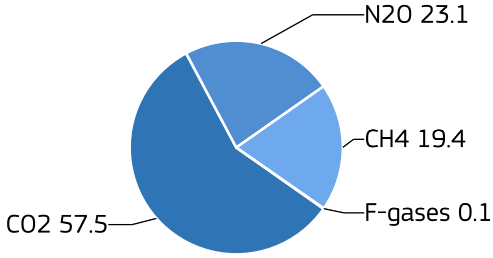
GHG emissions by sector



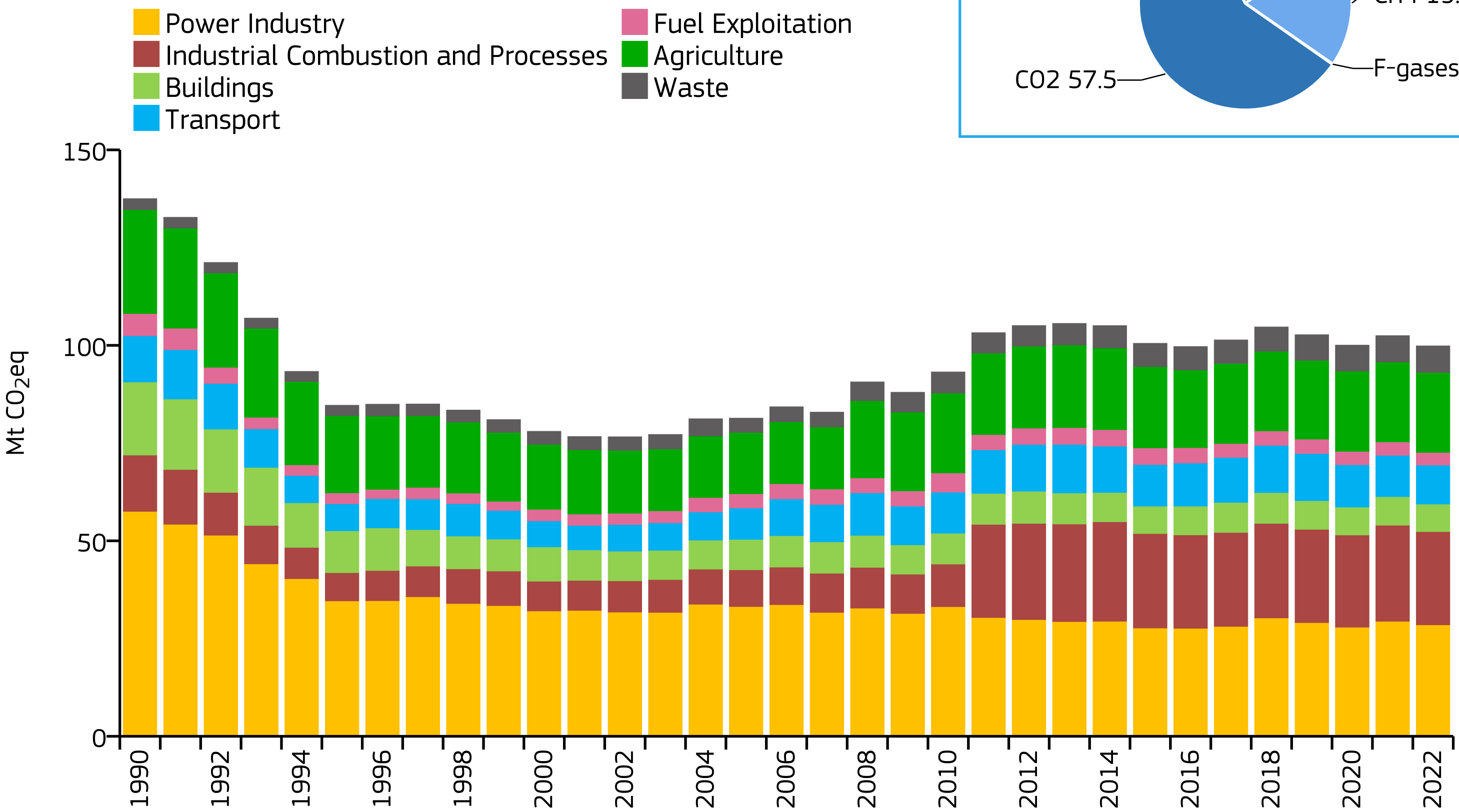
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.928	3.222	0.218	288.000k
2015	0.936	3.292	0.213	284.217k
2005	0.887	3.238	0.204	274.009k
1990	0.859	3.299	0.235	260.374k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+31%	+8%	+4%
Industrial Combustion and Processes	-15%	-30%	+1%
Buildings	-17%	+82%	+4%
Transport	+57%	+42%	+4%
Fuel Exploitation	+9%	-49%	0%
Agriculture	-45%	-1%	+1%
Waste	-3%	-1%	0%
All sectors	+8%	+5%	+3%

Belarus



GHG emissions by sector

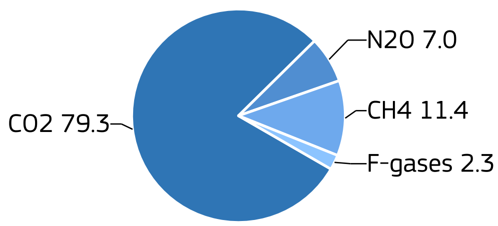


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	99.874	10.650	0.567	9.378M
2015	100.527	10.598	0.579	9.486M
2005	81.382	8.458	0.705	9.622M
1990	137.528	13.461	1.517	10.217M

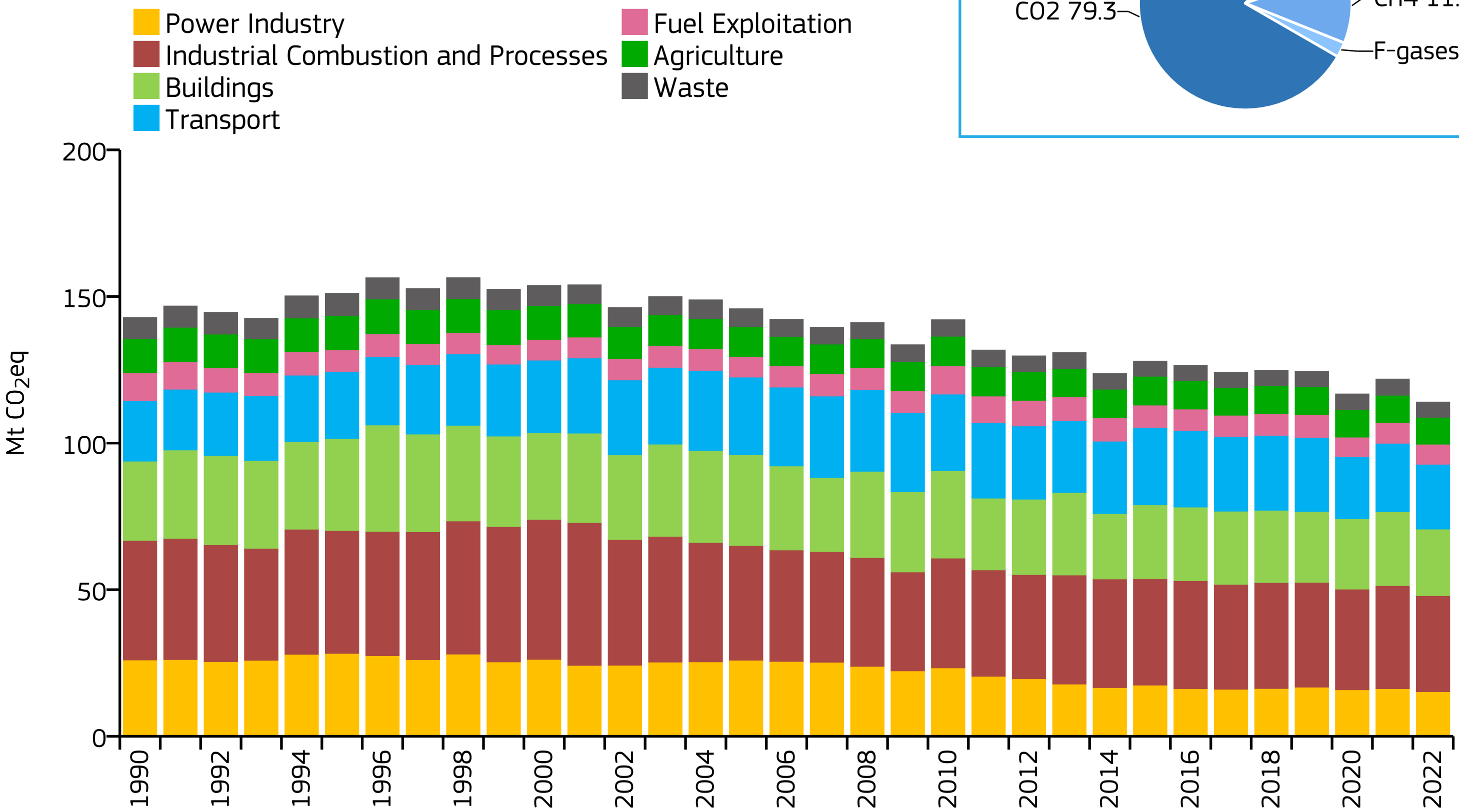
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-50%	-14%	-3%
Industrial Combustion and Processes	+66%	+153%	-3%
Buildings	-62%	-9%	-4%
Transport	-16%	+24%	-6%
Fuel Exploitation	-43%	-11%	-4%
Agriculture	-23%	+30%	0%
Waste	+141%	+87%	+1%
All sectors	-27%	+23%	-3%

Belgium

GHG % in 2022



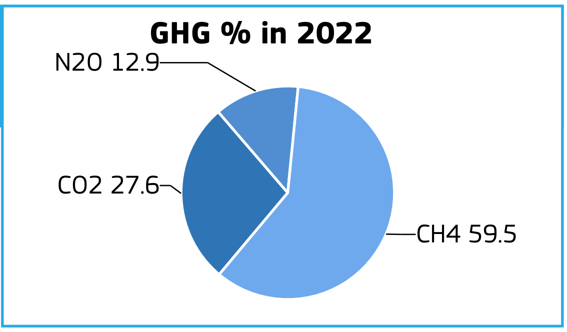
GHG emissions by sector



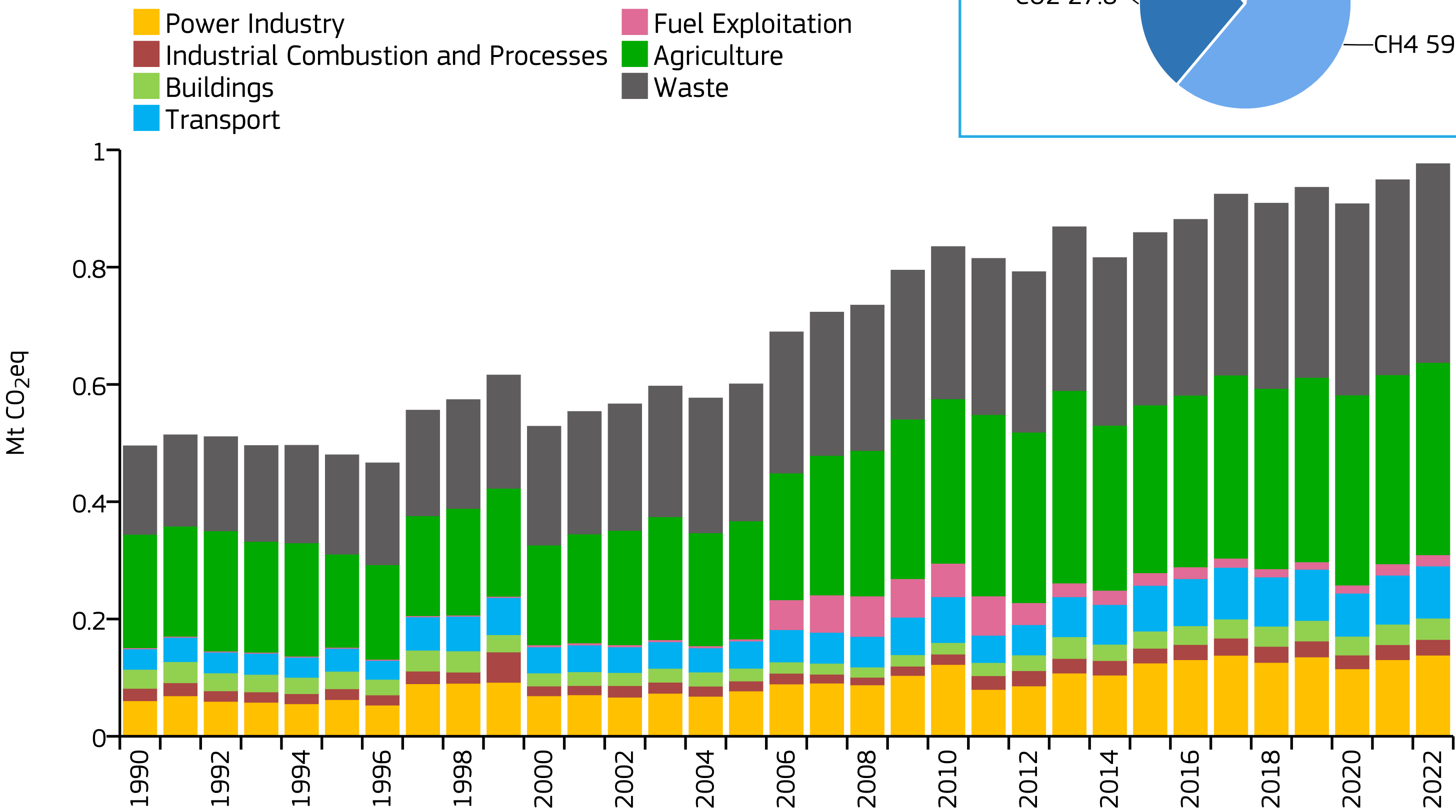
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	114.032	9.737	0.184	11.711M
2015	127.997	11.339	0.230	11.288M
2005	145.835	13.827	0.300	10.547M
1990	142.803	14.271	0.404	10.006M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	↘ -42%	↘ -42%	↘ -6%
Industrial Combustion and Processes	↘ -20%	↘ -16%	↘ -7%
Buildings	↘ -16%	↘ -27%	↘ -10%
Transport	↗ +8%	↘ -17%	→ -5%
Fuel Exploitation	↘ -29%	→ -2%	→ -4%
Agriculture	↘ -21%	↘ -10%	→ -1%
Waste	↘ -28%	↘ -15%	↘ -6%
All sectors	↘ -20%	↘ -22%	↘ -6%

Belize



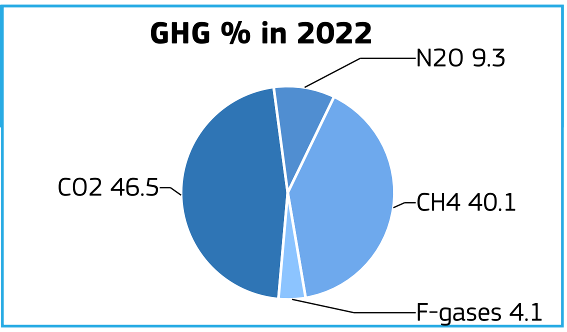
GHG emissions by sector



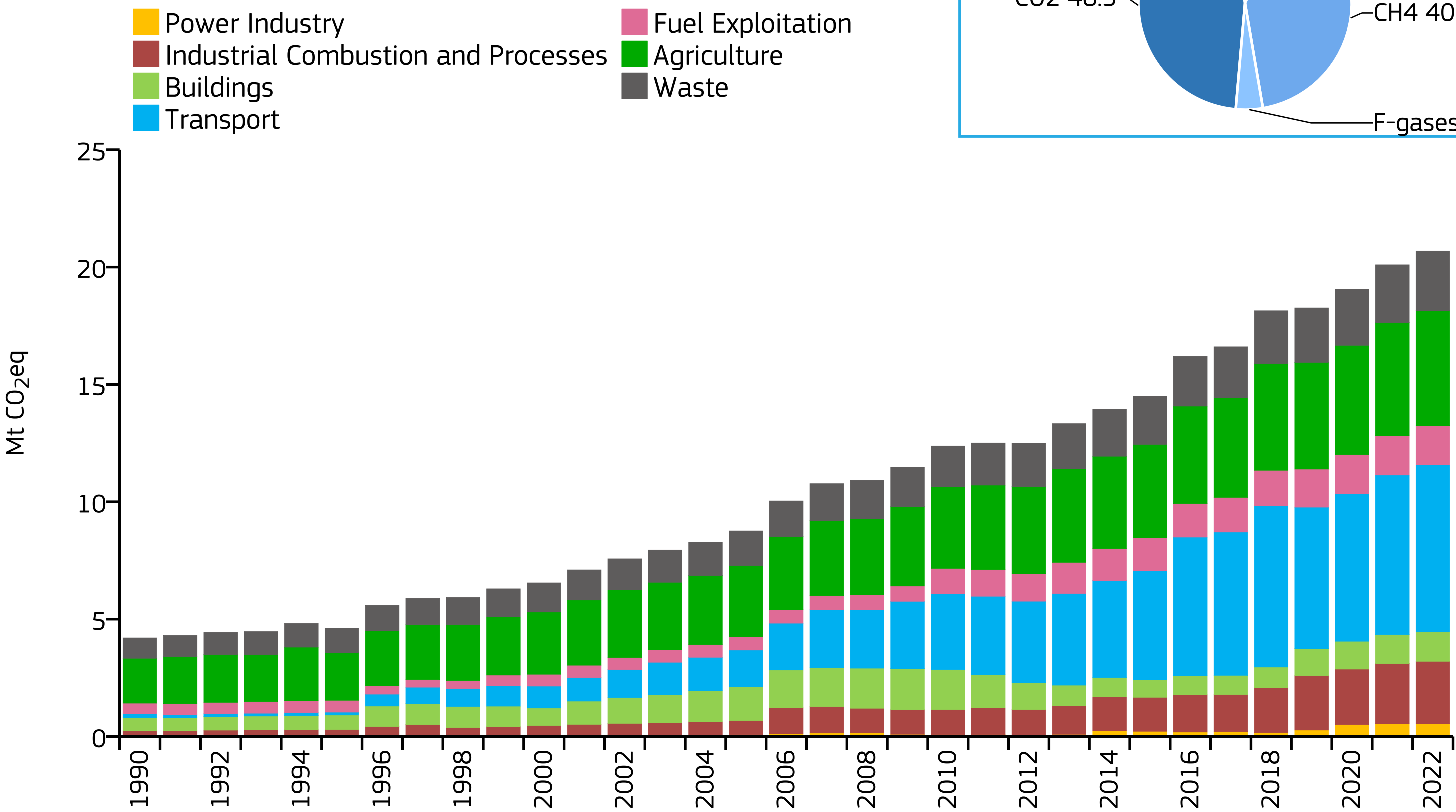
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.977	2.359	0.248	414.000k
2015	0.859	2.391	0.254	359.288k
2005	0.601	2.122	0.223	283.277k
1990	0.495	2.642	0.424	187.552k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+129%	+79%	+6%
Industrial Combustion and Processes	+26%	+57%	+4%
Buildings	+12%	+68%	+4%
Transport	+155%	+91%	+6%
Fuel Exploitation	> +300%	> +300%	-1%
Agriculture	+70%	+63%	+2%
Waste	+124%	+45%	+2%
All sectors	+97%	+62%	+3%

Benin



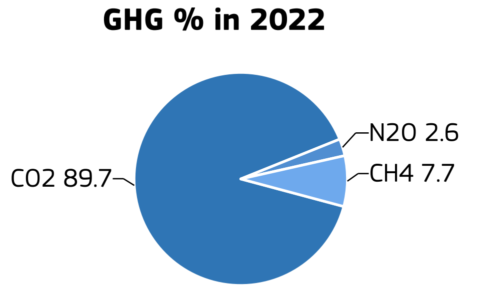
GHG emissions by sector



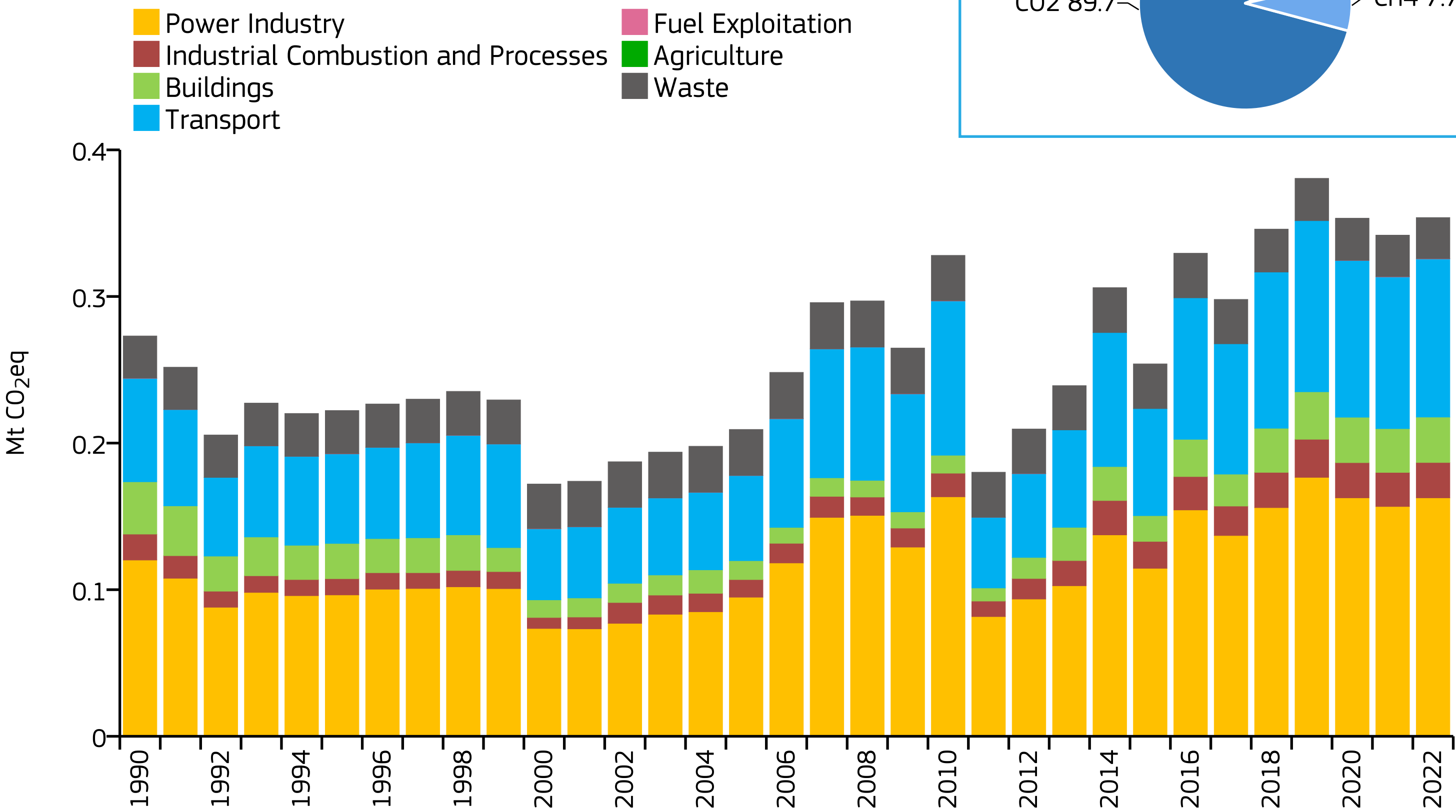
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	20.685	1.618	0.451	12.781M
2015	14.500	1.371	0.465	10.576M
2005	8.759	1.097	0.425	7.982M
1990	4.202	0.844	0.388	4.979M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	0%
Industrial Combustion and Processes	> +300%	> +300%	+4%
Buildings	+127%	-13%	+2%
Transport	> +300%	> +300%	+5%
Fuel Exploitation	+263%	+197%	0%
Agriculture	+157%	+61%	+2%
Waste	+191%	+72%	+3%
All sectors	> +300%	+136%	+3%

Bermuda



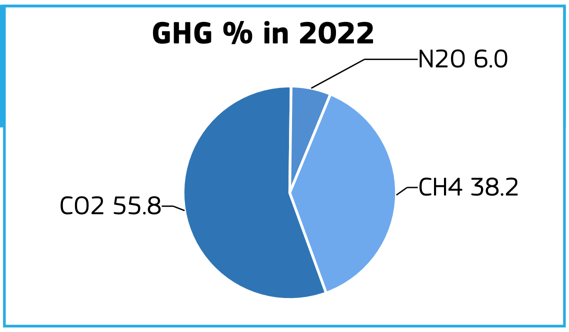
GHG emissions by sector



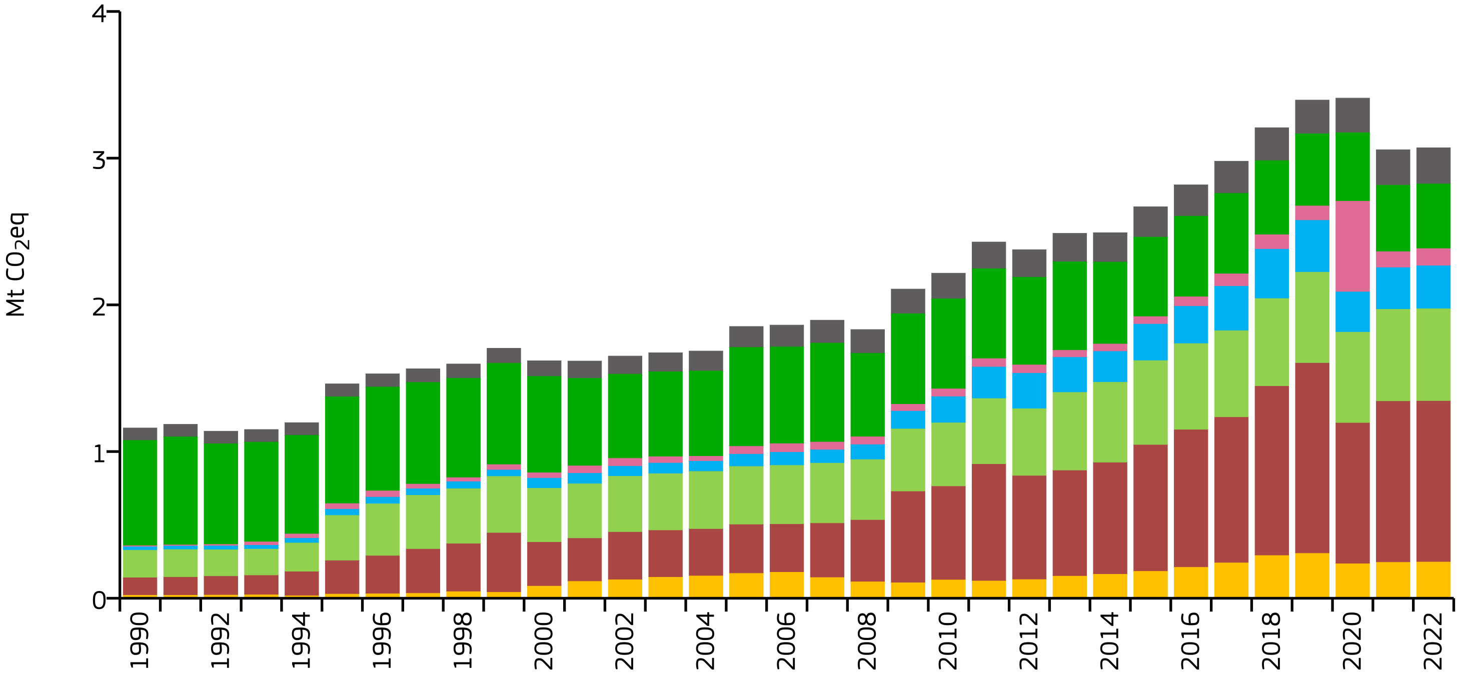
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.354	5.898	0.069	60.000k
2015	0.254	4.097	0.050	62.003k
2005	0.209	3.214	0.036	65.130k
1990	0.273	4.482	0.070	60.930k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+35%	+71%	+4%
Industrial Combustion and Processes	+36%	+101%	+4%
Buildings	-13%	+140%	+4%
Transport	+53%	+86%	+4%
Fuel Exploitation	> +300%	+184%	0%
Agriculture	n/a	n/a	n/a
Waste	-3%	-11%	-1%
All sectors	+30%	+69%	+4%

Bhutan



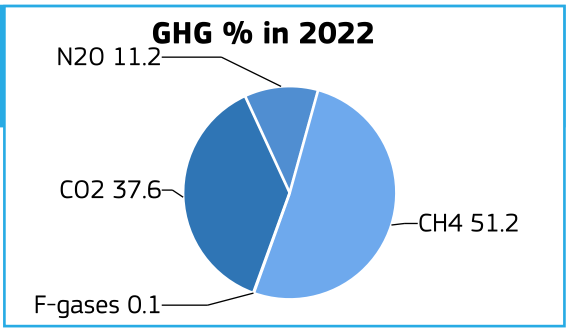
GHG emissions by sector



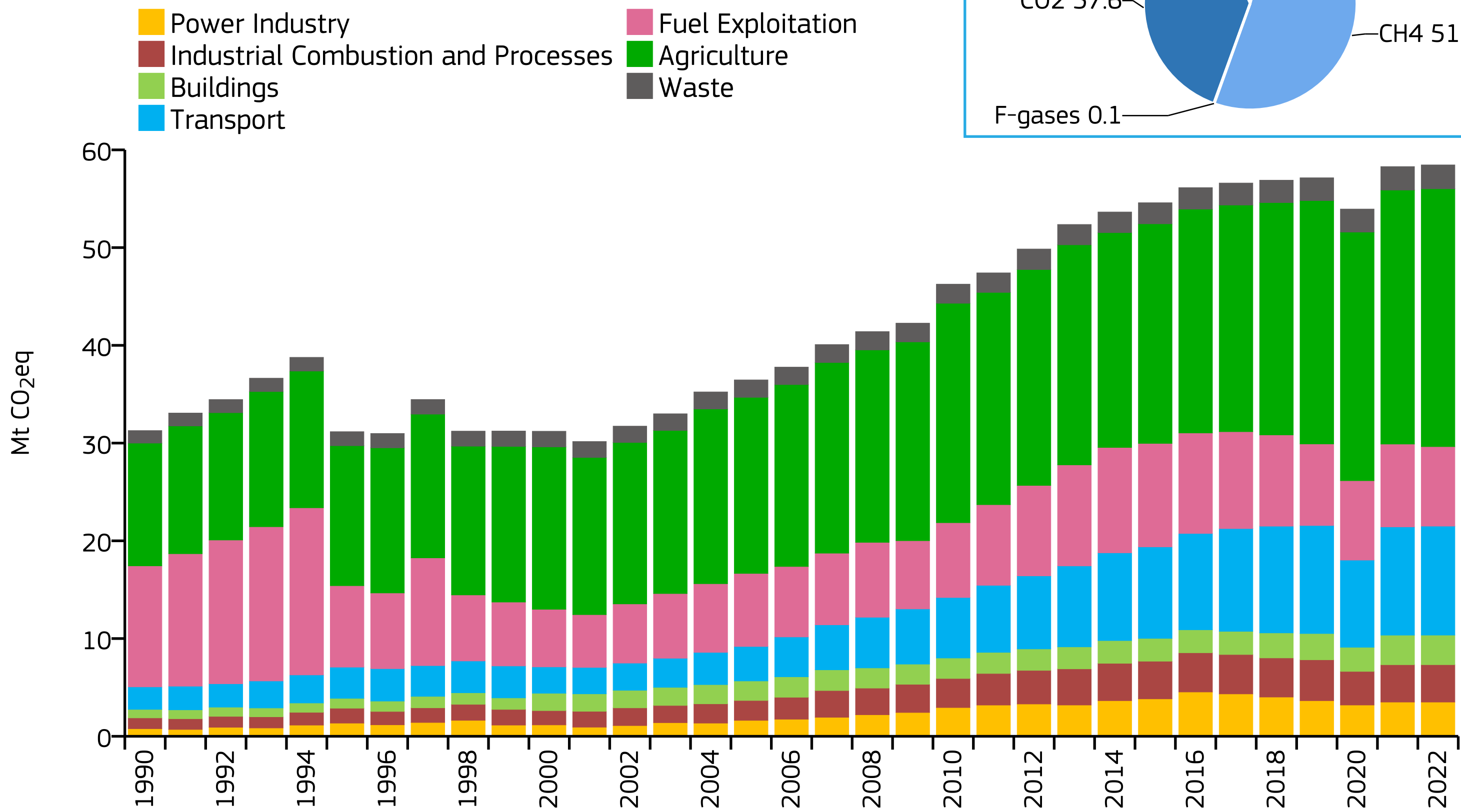
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3.071	3.600	0.374	853.000k
2015	2.669	3.390	0.364	787.386k
2005	1.853	2.821	0.523	656.639k
1990	1.161	2.160	0.759	537.280k

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+45%	+1%
Industrial Combustion and Processes	> +300%	+230%	0%
Buildings	+236%	+59%	0%
Transport	> +300%	+250%	+3%
Fuel Exploitation	> +300%	+118%	+7%
Agriculture	-39%	-35%	-3%
Waste	+199%	+75%	+2%
All sectors	+165%	+66%	0%

Bolivia



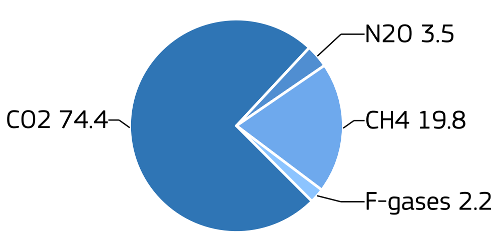
GHG emissions by sector



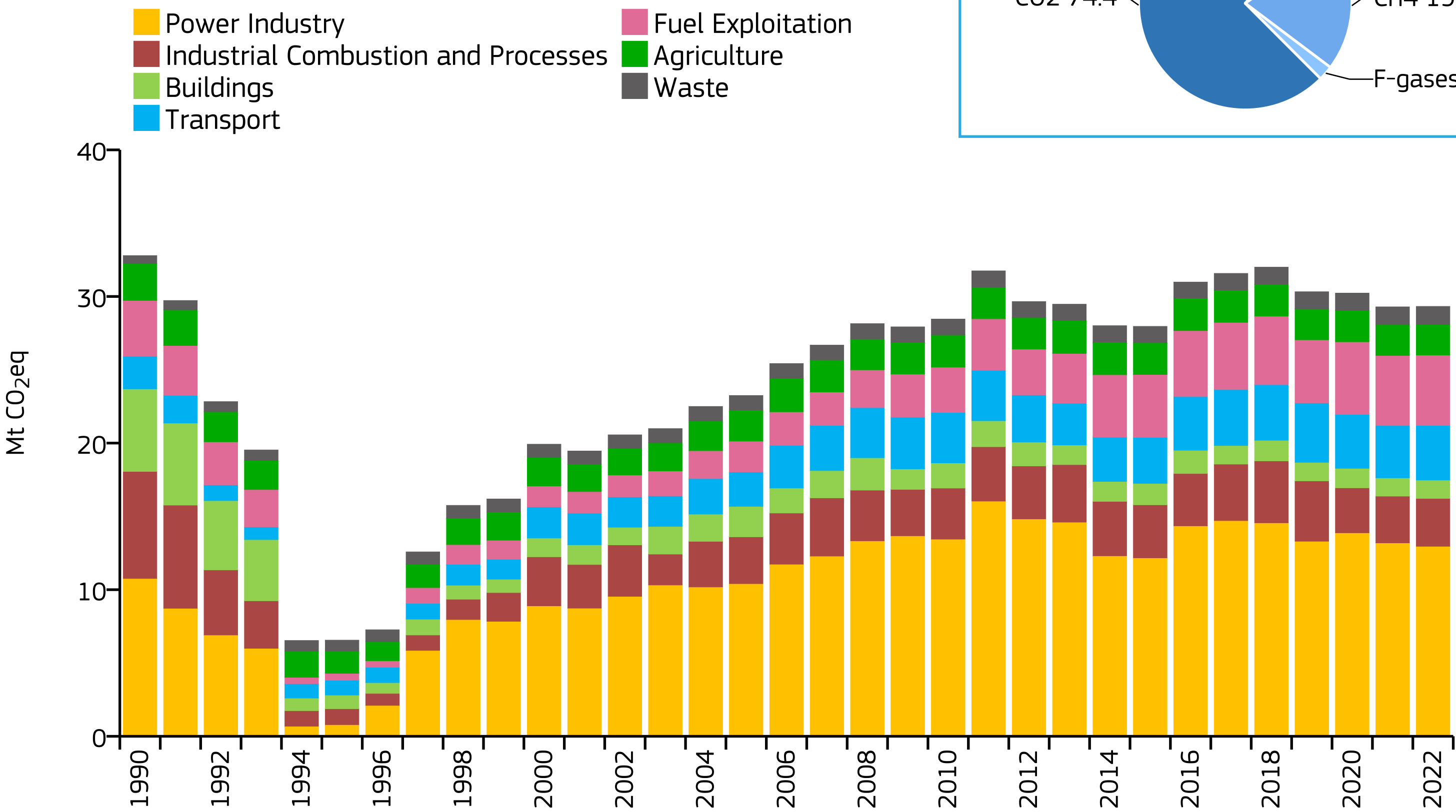
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	58.463	4.924	0.583	11.872M
2015	54.592	5.090	0.629	10.725M
2005	36.468	3.996	0.687	9.125M
1990	31.279	4.562	0.993	6.856M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+115%	0%
Industrial Combustion and Processes	+247%	+88%	0%
Buildings	+247%	+52%	0%
Transport	> +300%	+216%	+1%
Fuel Exploitation	-34%	+9%	-4%
Agriculture	+110%	+46%	+2%
Waste	+91%	+37%	+2%
All sectors	+87%	+60%	0%

Bosnia and Herzegovina



GHG emissions by sector

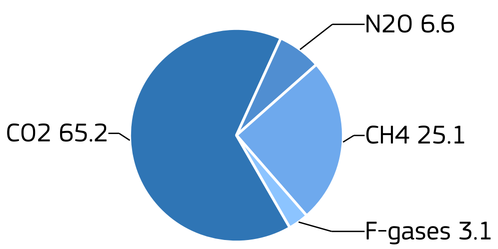


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	29.324	8.414	0.543	3.485M
2015	27.962	7.908	0.638	3.536M
2005	23.248	6.148	0.660	3.782M
1990	32.790	7.346	3.991	4.463M

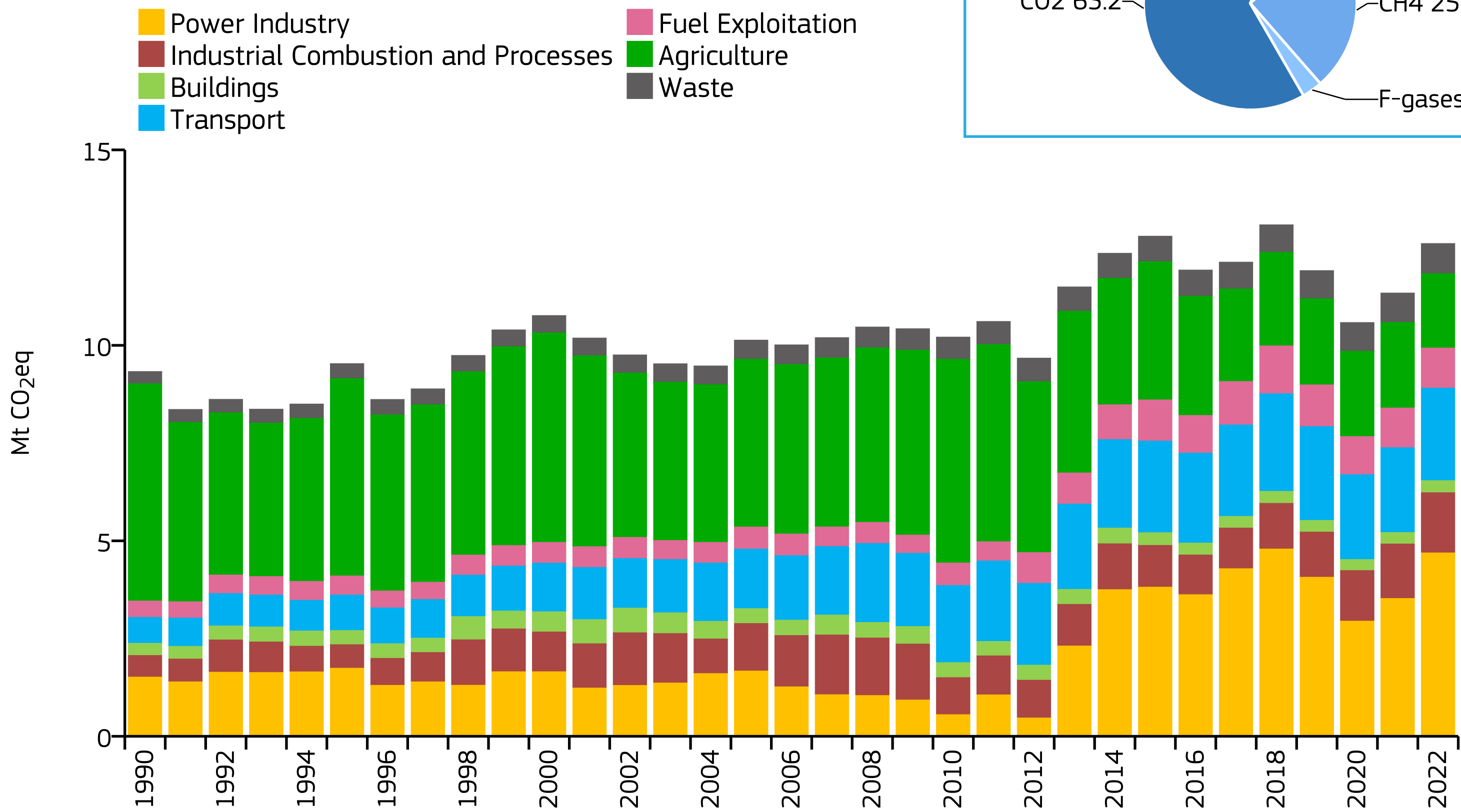
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+20%	+24%	-2%
Industrial Combustion and Processes	-55%	+2%	+2%
Buildings	-78%	-40%	0%
Transport	+68%	+60%	+4%
Fuel Exploitation	+26%	+127%	0%
Agriculture	-17%	-1%	-1%
Waste	+125%	+24%	+1%
All sectors	-11%	+26%	0%

Botswana

GHG % in 2022



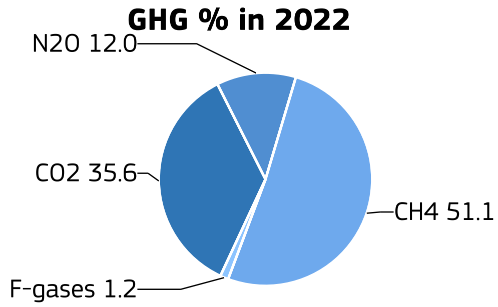
GHG emissions by sector



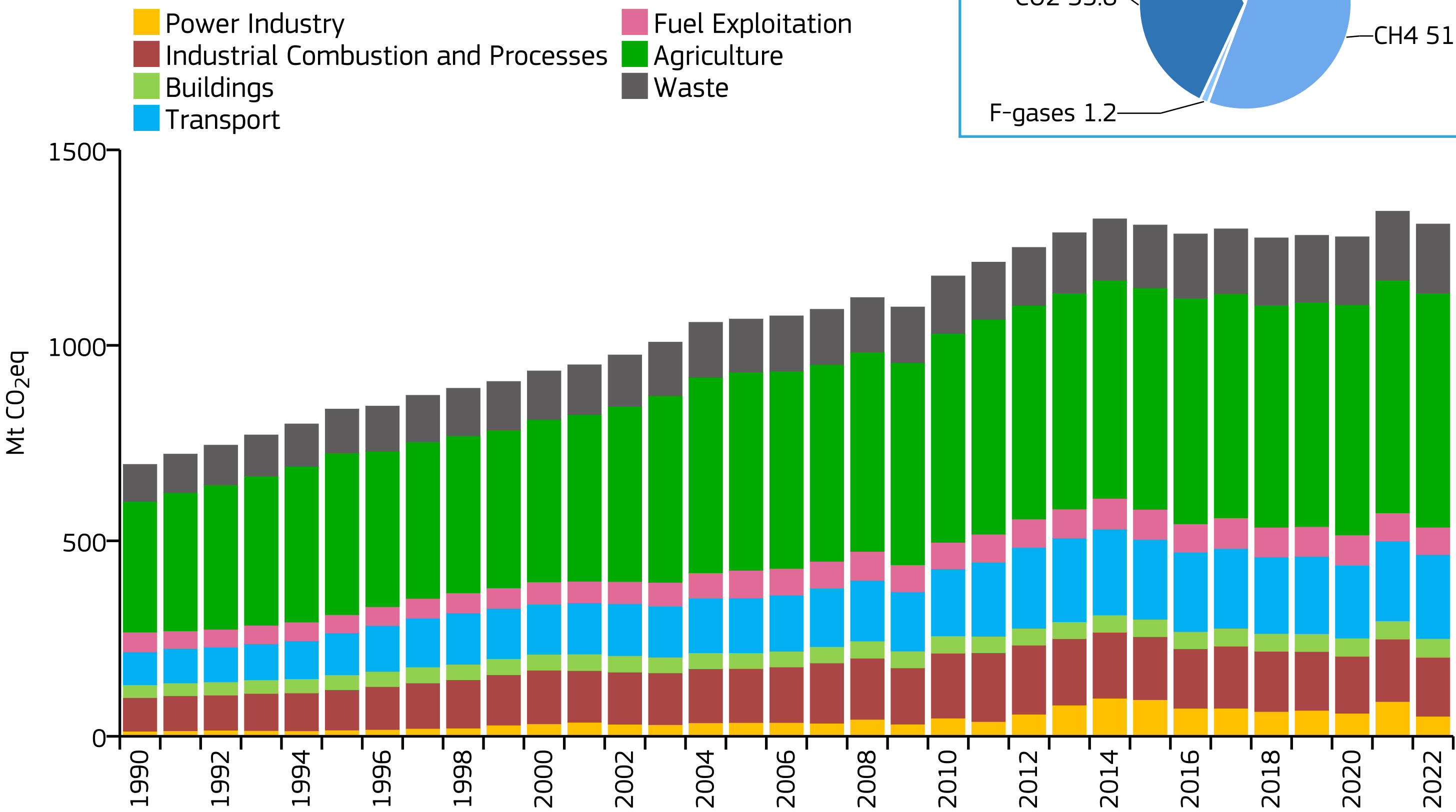
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	12.607	5.051	0.309	2.496M
2015	12.795	5.792	0.406	2.209M
2005	10.136	5.462	0.429	1.856M
1990	9.334	6.774	0.759	1.378M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+208%	+179%	+33%
Industrial Combustion and Processes	+178%	+27%	+10%
Buildings	-1%	-19%	+6%
Transport	+257%	+55%	+9%
Fuel Exploitation	+145%	+82%	+1%
Agriculture	-66%	-56%	-13%
Waste	+153%	+59%	+2%
All sectors	+35%	+24%	+11%

Brazil



GHG emissions by sector

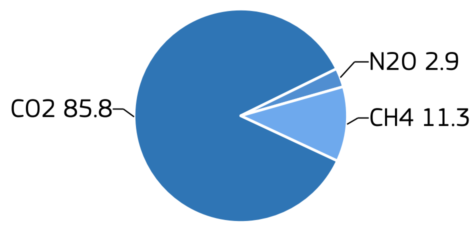


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1310.499	6.049	0.403	216.636M
2015	1307.969	6.351	0.425	205.962M
2005	1067.459	5.711	0.456	186.917M
1990	695.638	4.658	0.444	149.352M

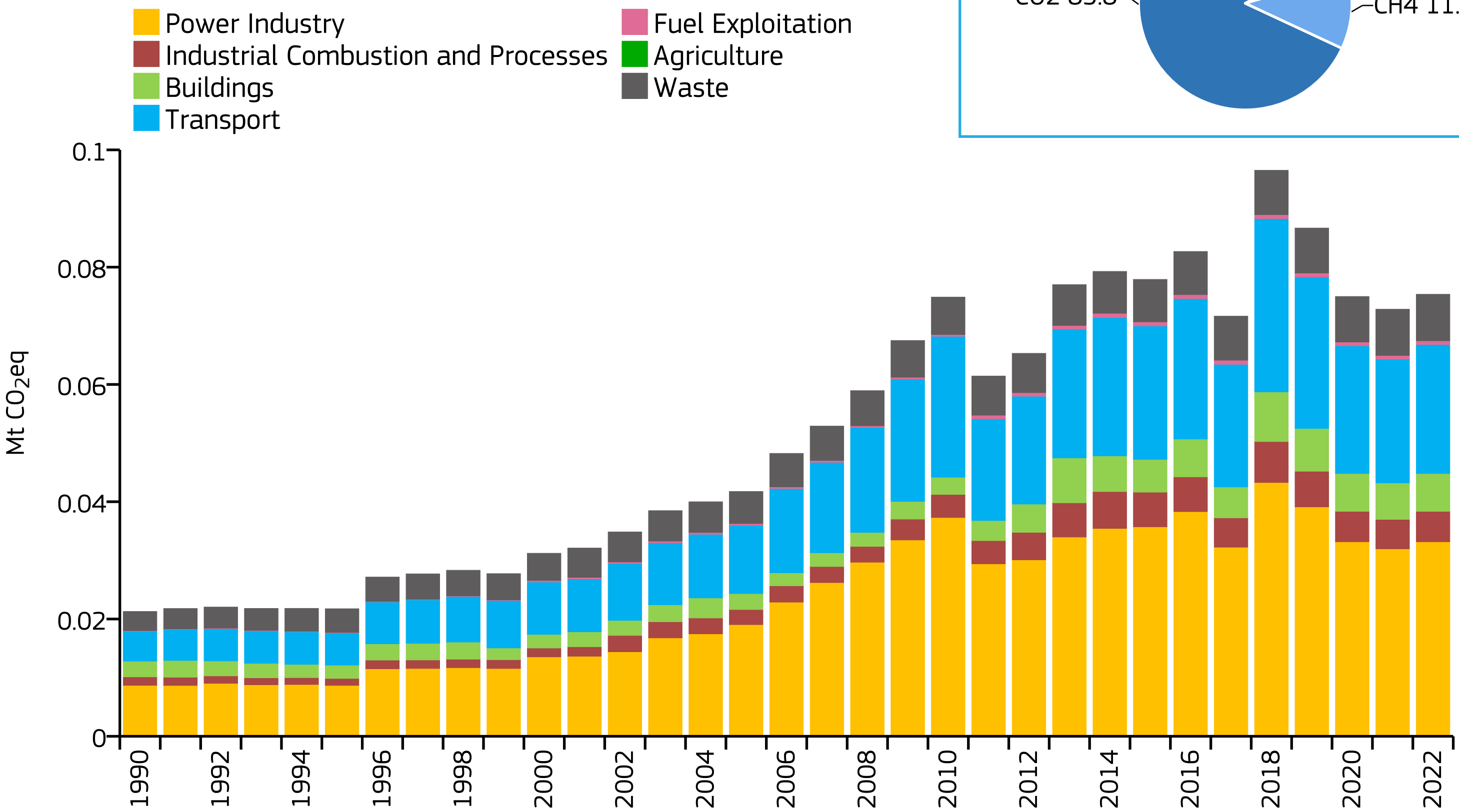
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+297%	+46%	-43%
Industrial Combustion and Processes	+75%	+9%	-6%
Buildings	+47%	+20%	+4%
Transport	+155%	+53%	+5%
Fuel Exploitation	+38%	-1%	-3%
Agriculture	+79%	+18%	+1%
Waste	+86%	+30%	0%
All sectors	+88%	+23%	-2%

British Virgin Islands

GHG % in 2022



GHG emissions by sector

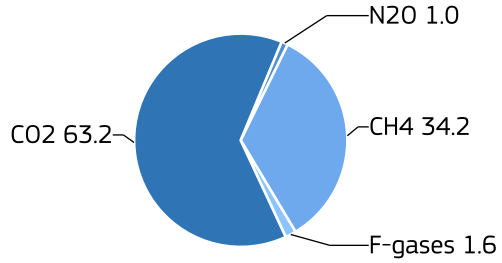


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.075	2.284	0.061	33.000k
2015	0.078	2.587	0.076	30.113k
2005	0.042	1.802	0.040	23.168k
1990	0.021	1.293	0.106	16.461k

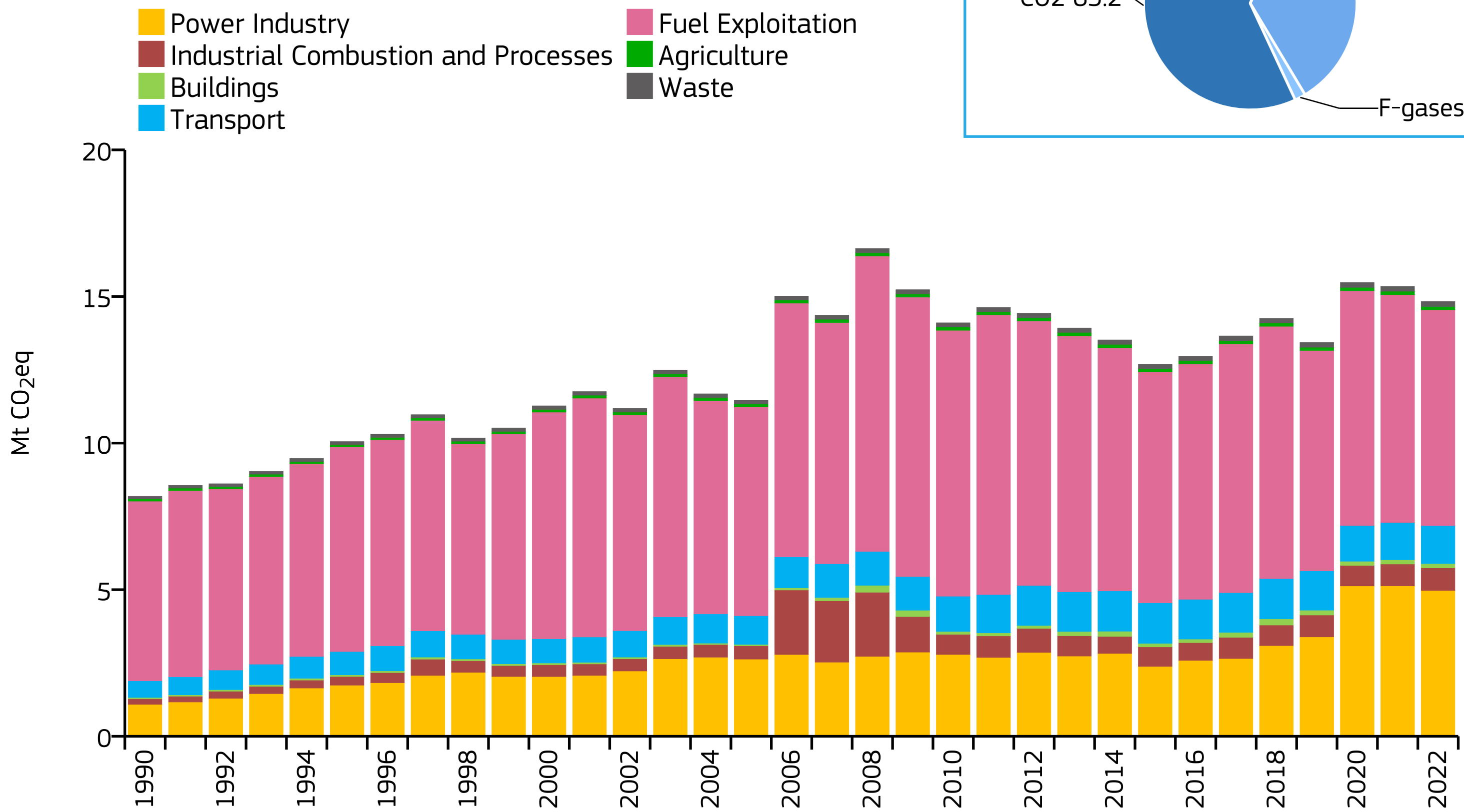
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+282%	+74%	+4%
Industrial Combustion and Processes	+258%	+102%	+3%
Buildings	+140%	+137%	+4%
Transport	> +300%	+89%	+4%
Fuel Exploitation	> +300%	+118%	0%
Agriculture	n/a	n/a	n/a
Waste	+142%	+45%	+1%
All sectors	+254%	+81%	+4%

Brunei

GHG % in 2022



GHG emissions by sector

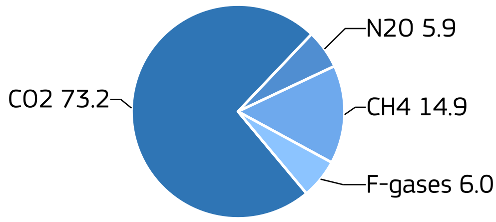


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	14.829	32.664	0.563	454.000k
2015	12.693	30.399	0.484	417.542k
2005	11.465	31.398	0.450	365.158k
1990	8.183	31.619	0.444	258.785k

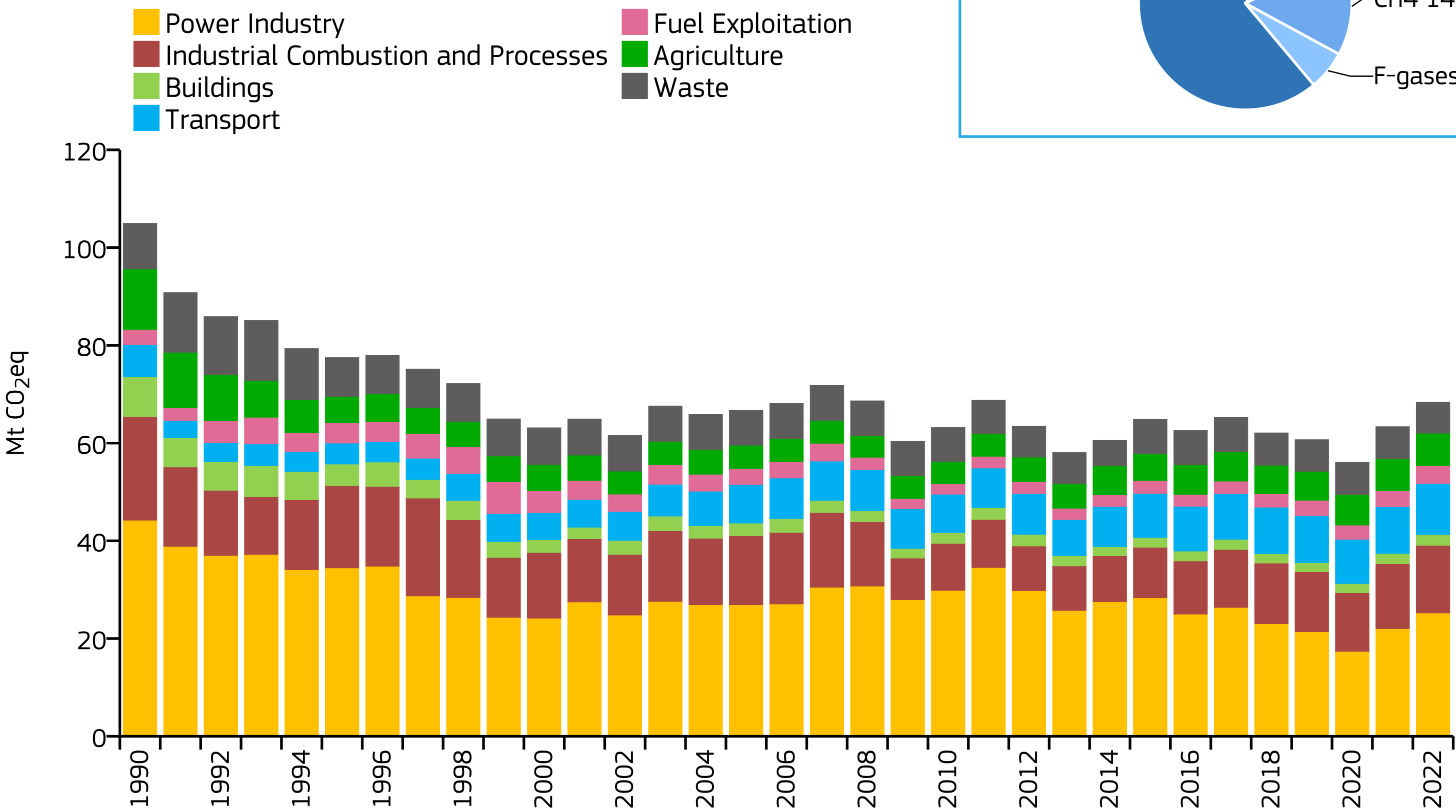
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+89%	-3%
Industrial Combustion and Processes	> +300%	+70%	+3%
Buildings	+210%	+183%	0%
Transport	+129%	+33%	+2%
Fuel Exploitation	+20%	+3%	-5%
Agriculture	+52%	+15%	+1%
Waste	+95%	+26%	+1%
All sectors	+81%	+29%	-3%

Bulgaria

GHG % in 2022



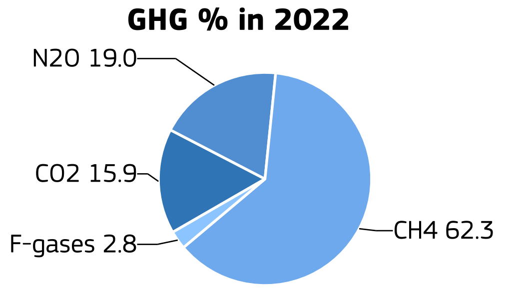
GHG emissions by sector



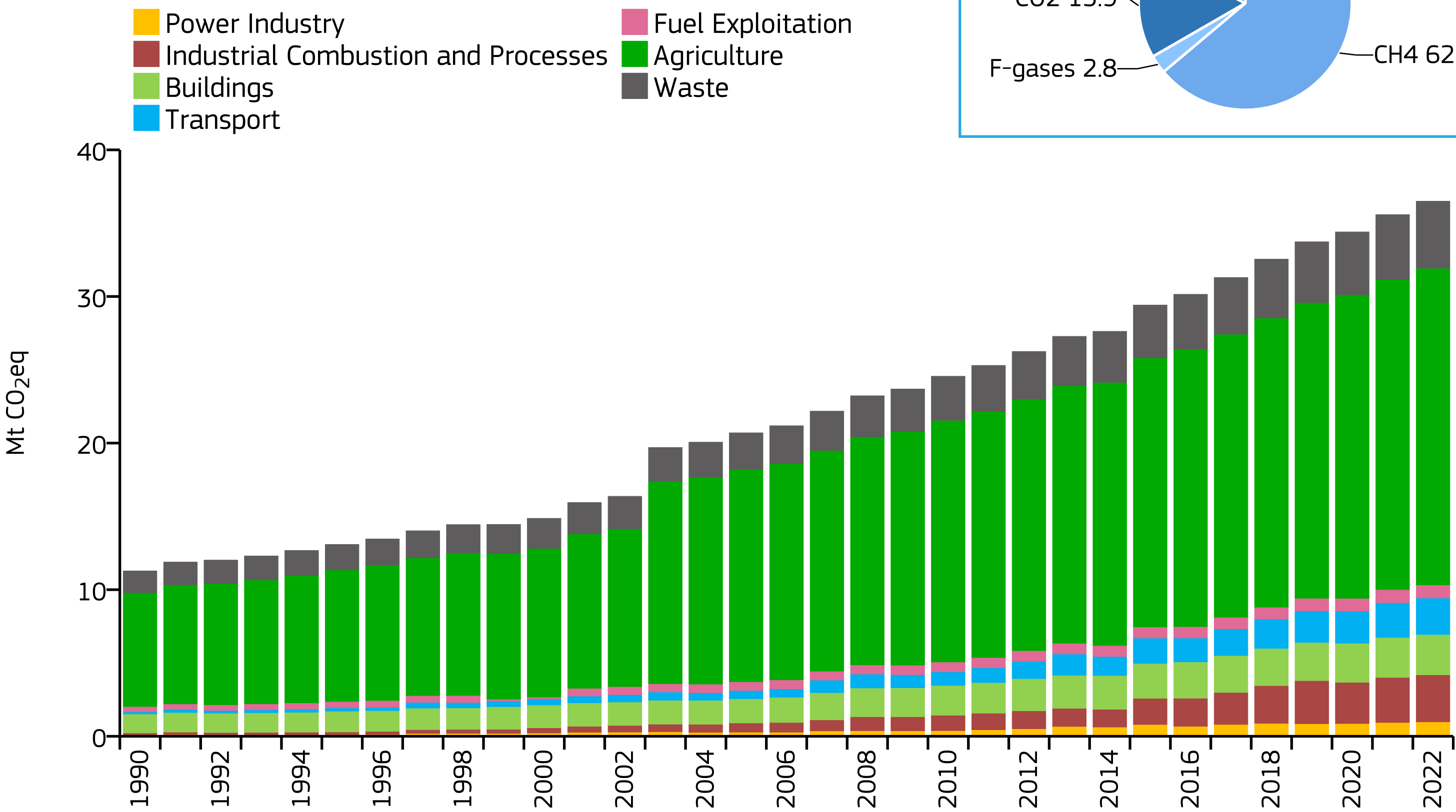
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	68.414	9.996	0.395	6.844M
2015	64.906	9.043	0.452	7.177M
2005	66.755	8.688	0.590	7.684M
1990	104.986	11.874	0.963	8.841M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-43%	-6%	+15%
Industrial Combustion and Processes	-35%	-2%	+4%
Buildings	-73%	-14%	+4%
Transport	+59%	+33%	+9%
Fuel Exploitation	+17%	+10%	+12%
Agriculture	-46%	+40%	0%
Waste	-32%	-11%	-2%
All sectors	-35%	+2%	+8%

Burkina Faso



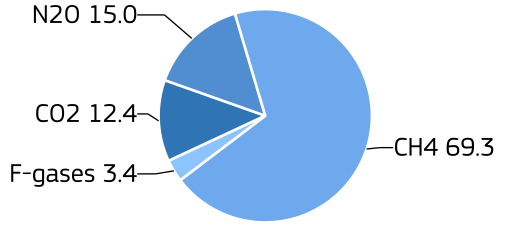
GHG emissions by sector



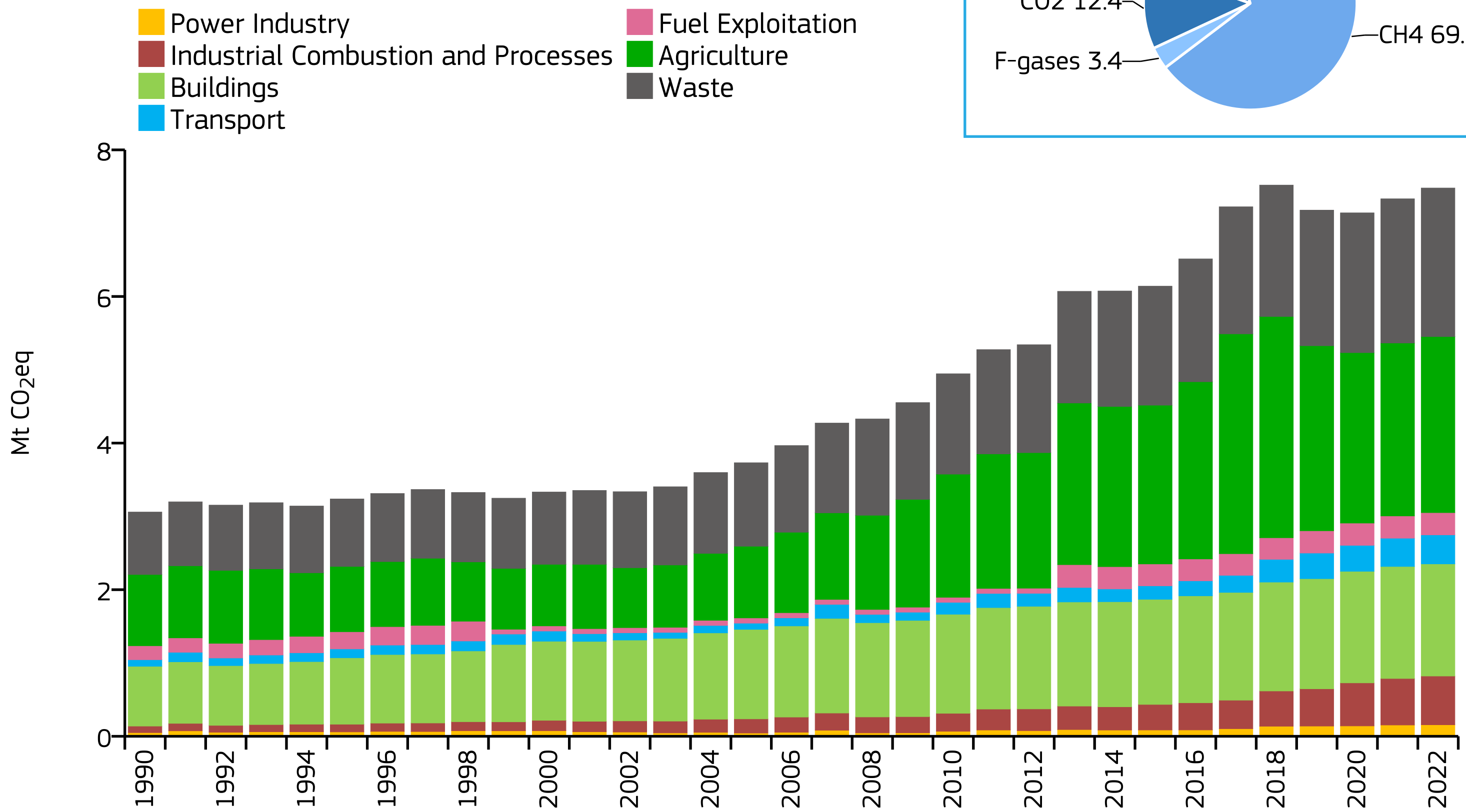
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	36.497	1.651	0.747	22.103M
2015	29.417	1.624	0.844	18.111M
2005	20.701	1.542	1.010	13.422M
1990	11.283	1.281	1.259	8.811M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+249%	+5%
Industrial Combustion and Processes	> +300%	> +300%	+4%
Buildings	+112%	+66%	+1%
Transport	> +300%	> +300%	+5%
Fuel Exploitation	+148%	+49%	0%
Agriculture	+178%	+49%	+2%
Waste	+208%	+84%	+3%
All sectors	+223%	+76%	+3%

Burundi



GHG emissions by sector

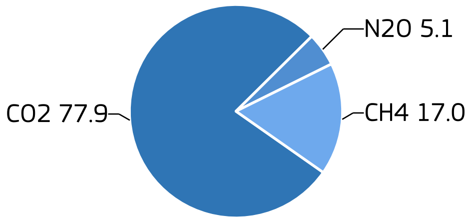


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	7.480	0.590	0.819	12.675M
2015	6.140	0.602	0.732	10.199M
2005	3.732	0.503	0.634	7.423M
1990	3.059	0.565	0.475	5.415M

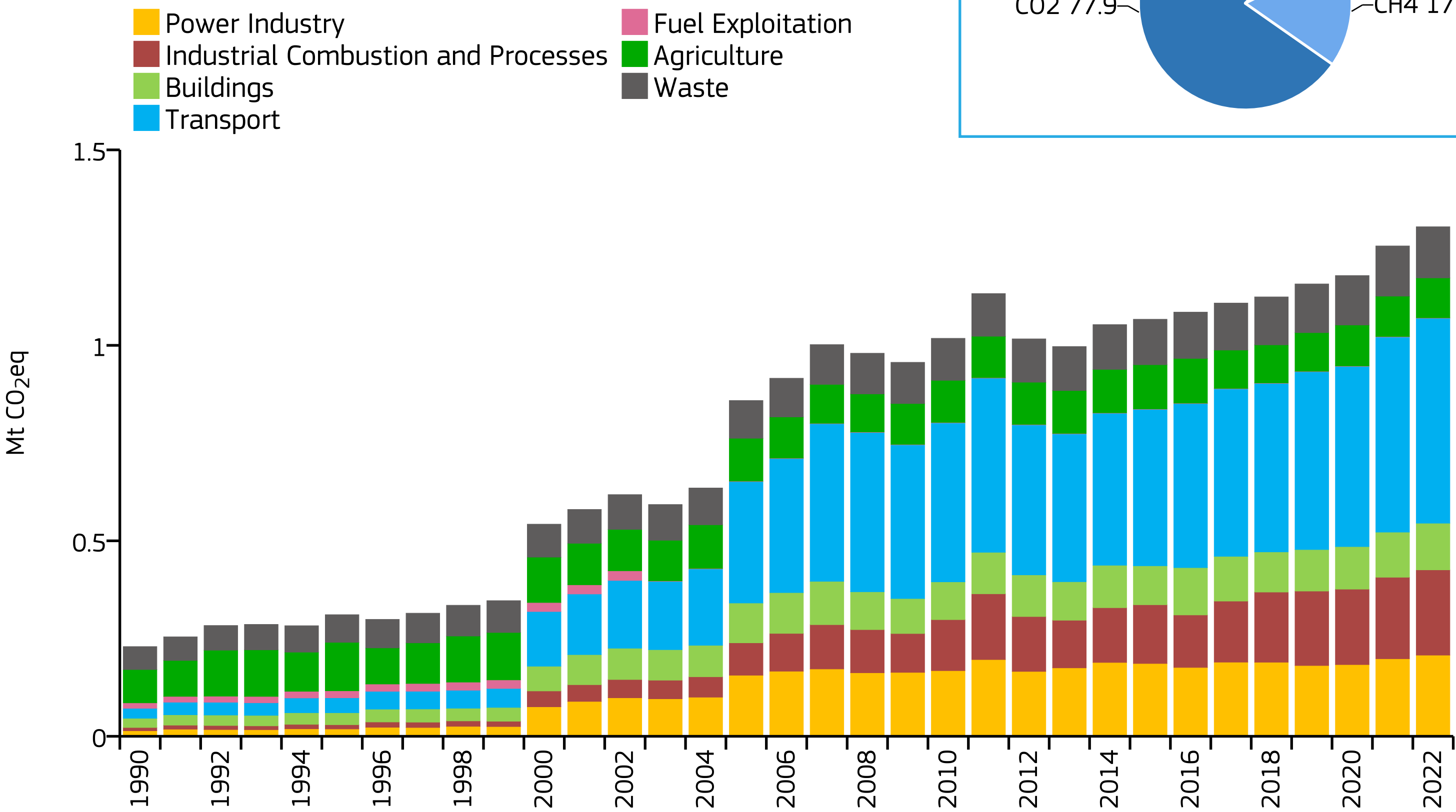
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+214%	+257%	+2%
Industrial Combustion and Processes	> +300%	+244%	+5%
Buildings	+87%	+25%	0%
Transport	> +300%	> +300%	+3%
Fuel Exploitation	+59%	> +300%	0%
Agriculture	+147%	+145%	+2%
Waste	+138%	+78%	+3%
All sectors	+145%	+100%	+2%

Cabo Verde

GHG % in 2022



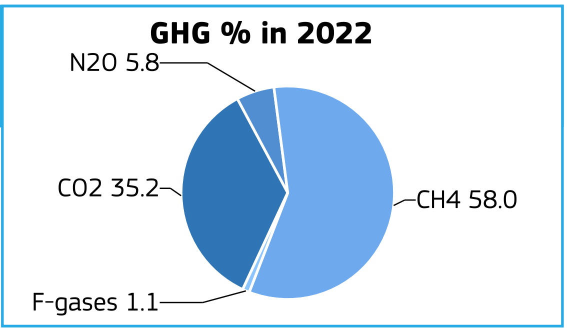
GHG emissions by sector



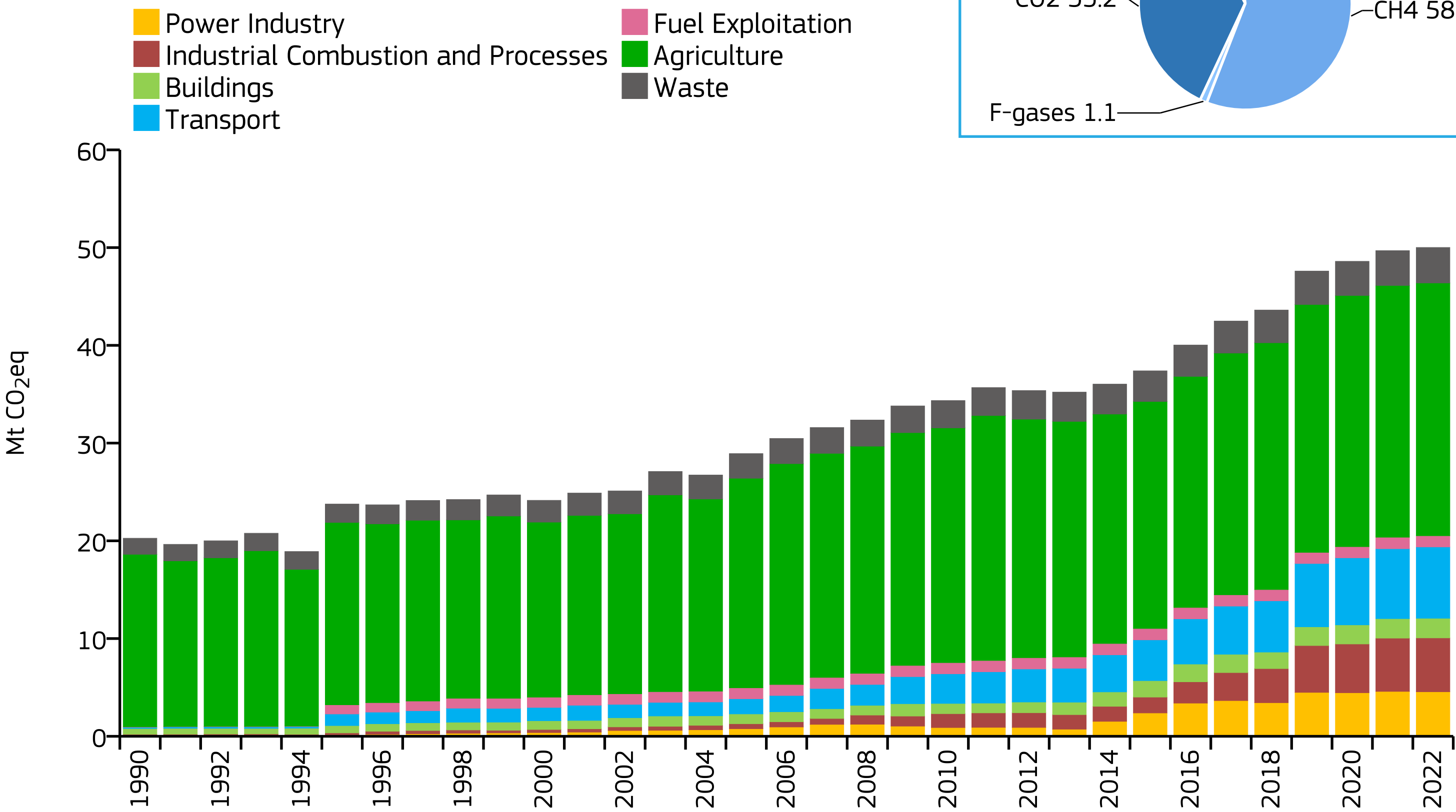
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.303	2.239	0.286	582.000k
2015	1.067	2.002	0.289	532.913k
2005	0.859	1.810	0.334	474.567k
1990	0.229	0.671	0.347	341.883k

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+33%	+5%
Industrial Combustion and Processes	> +300%	+163%	+5%
Buildings	> +300%	+17%	+3%
Transport	> +300%	+69%	+5%
Fuel Exploitation	-92%	-3%	0%
Agriculture	+20%	-7%	-1%
Waste	+122%	+35%	+2%
All sectors	> +300%	+52%	+4%

Cambodia



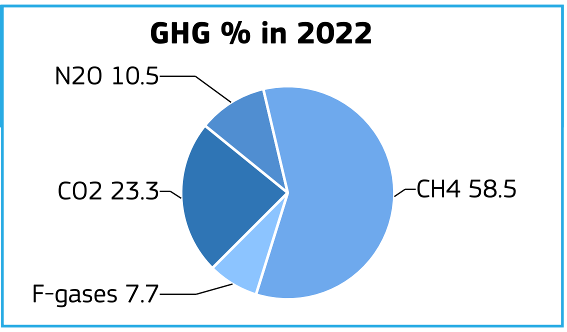
GHG emissions by sector



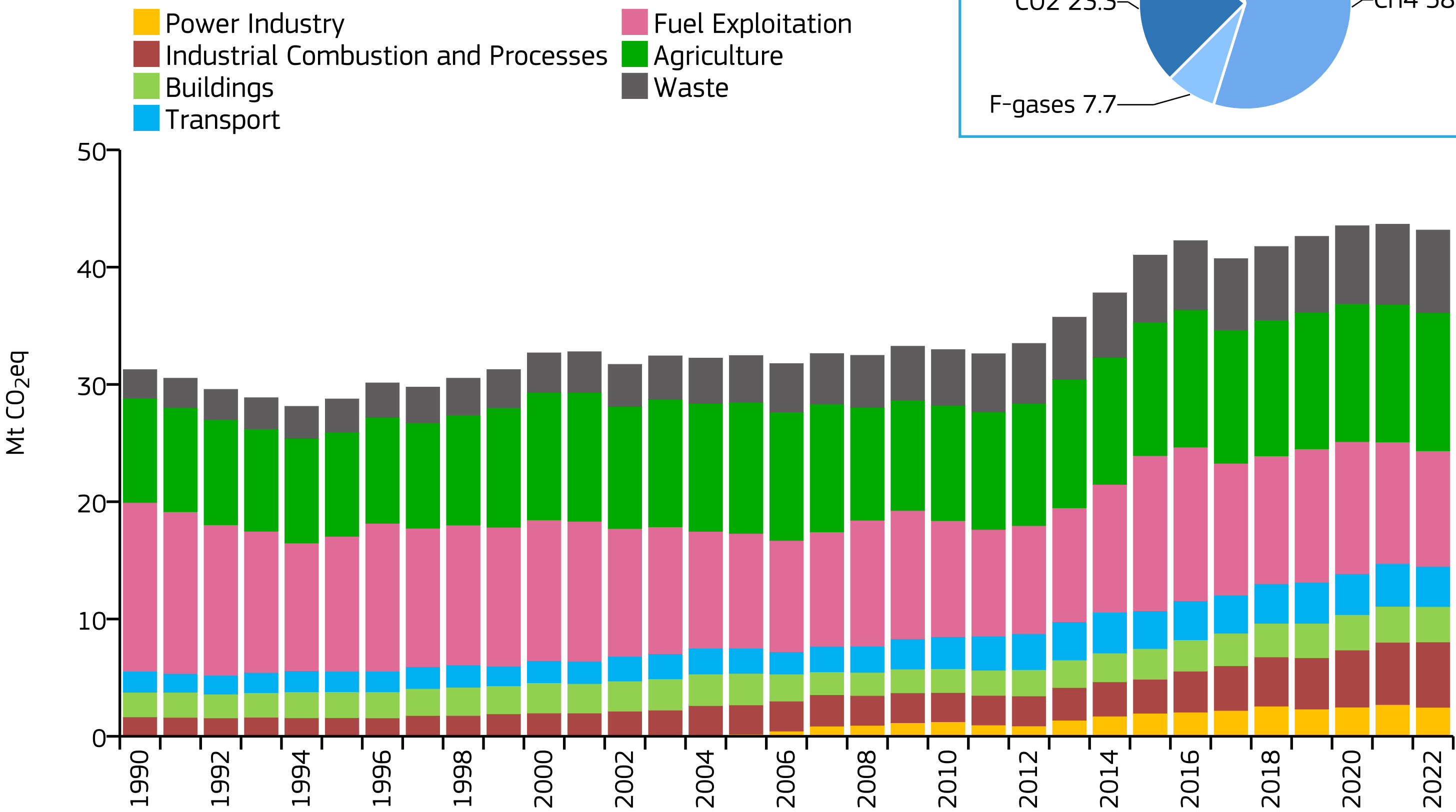
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	50.016	2.914	0.658	17.167M
2015	37.394	2.410	0.680	15.518M
2005	28.924	2.180	1.028	13.270M
1990	20.265	2.258	1.417	8.973M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-1%
Industrial Combustion and Processes	> +300%	> +300%	+1%
Buildings	+244%	+101%	+1%
Transport	> +300%	> +300%	+2%
Fuel Exploitation	> +300%	+3%	-2%
Agriculture	+46%	+21%	0%
Waste	+121%	+44%	+2%
All sectors	+147%	+73%	+1%

Cameroon



GHG emissions by sector

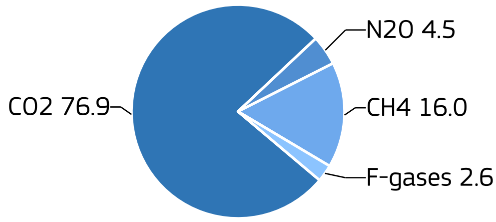


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	43.171	1.583	0.414	27.279M
2015	41.035	1.797	0.493	22.834M
2005	32.468	1.864	0.582	17.421M
1990	31.266	2.669	0.785	11.715M

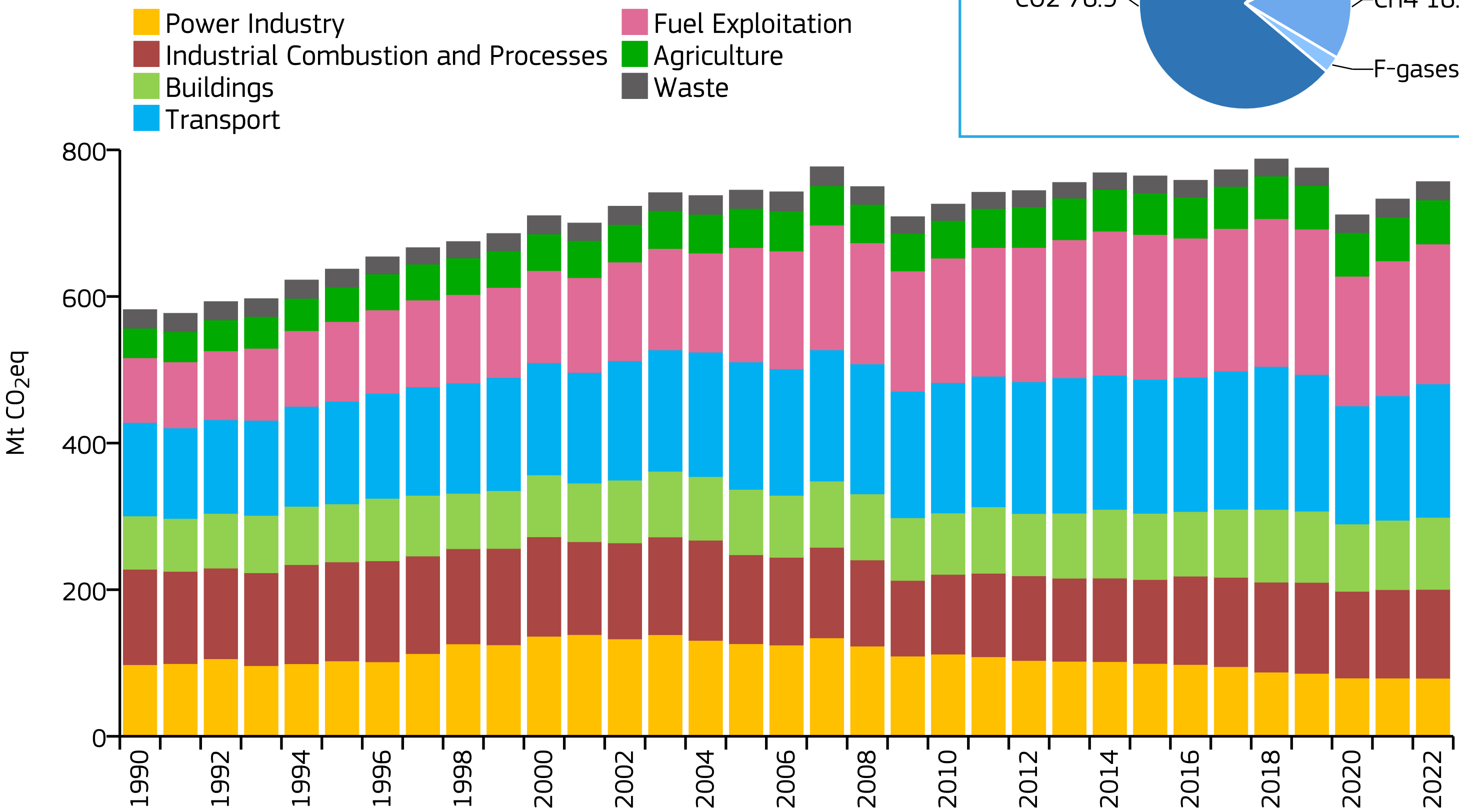
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-9%
Industrial Combustion and Processes	+246%	+123%	+5%
Buildings	+44%	+12%	-2%
Transport	+91%	+59%	-7%
Fuel Exploitation	-31%	+1%	-5%
Agriculture	+32%	+5%	+1%
Waste	+189%	+76%	+3%
All sectors	+38%	+33%	-1%

Canada

GHG % in 2022



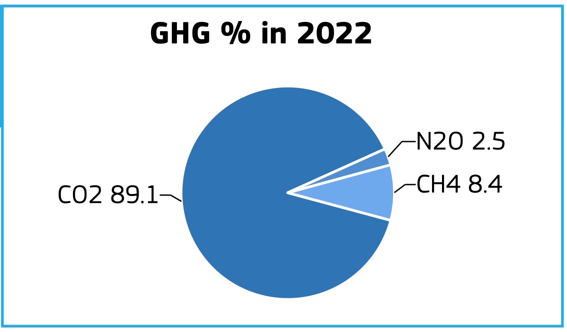
GHG emissions by sector



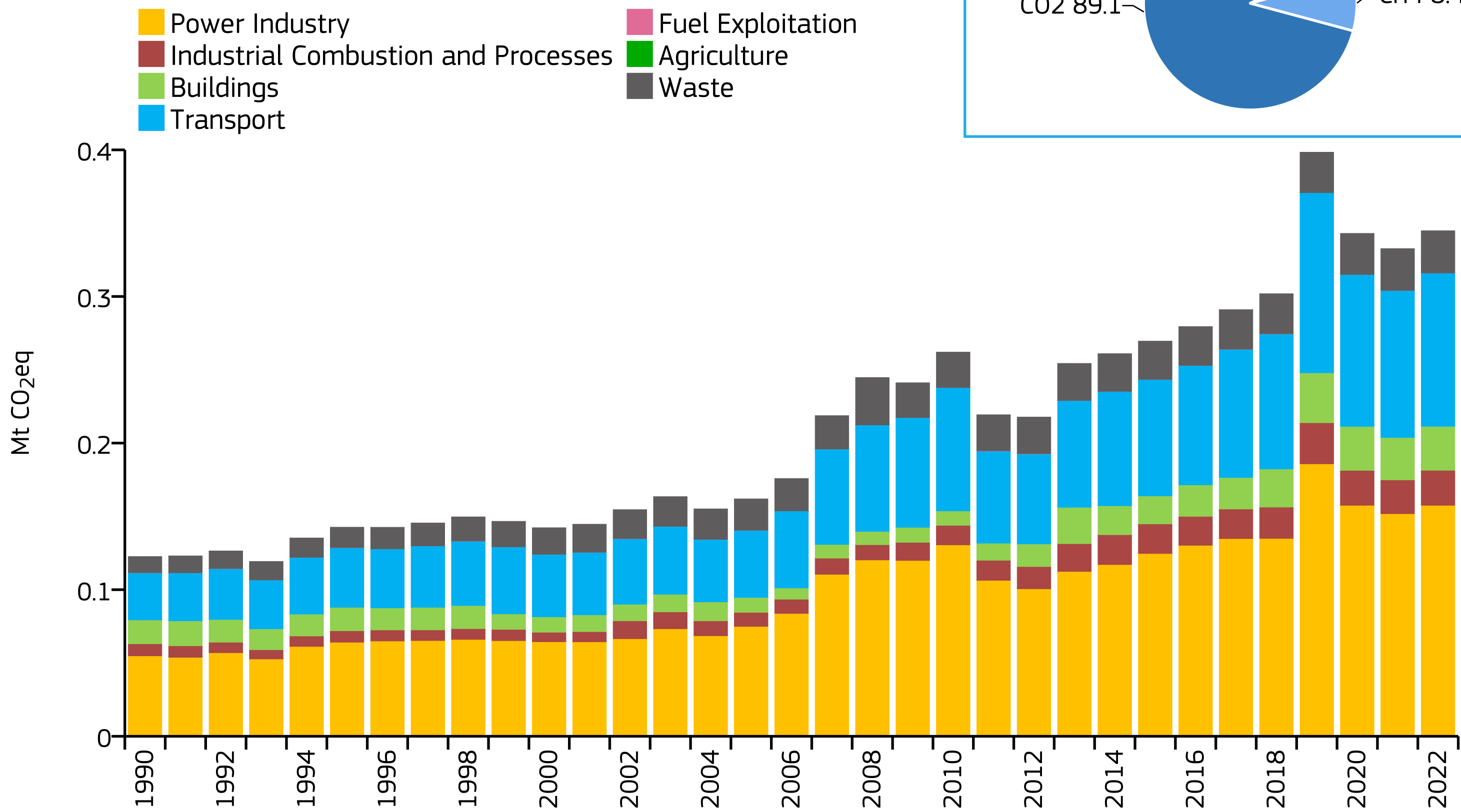
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	756.810	19.790	0.397	38.242M
2015	764.535	21.267	0.451	35.950M
2005	745.212	23.080	0.517	32.288M
1990	582.165	21.022	0.608	27.693M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-19%	-37%	0%
Industrial Combustion and Processes	-7%	0%	0%
Buildings	+35%	+10%	+4%
Transport	+43%	+5%	+7%
Fuel Exploitation	+116%	+22%	+4%
Agriculture	+49%	+12%	+1%
Waste	-1%	0%	+1%
All sectors	+30%	+2%	+3%

Cayman Islands



GHG emissions by sector

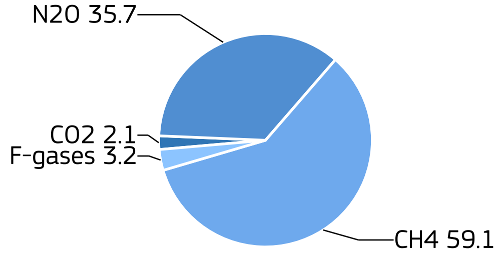


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.345	5.305	0.064	65.000k
2015	0.270	4.495	0.065	59.963k
2005	0.162	3.332	0.044	48.622k
1990	0.123	4.903	0.054	25.010k

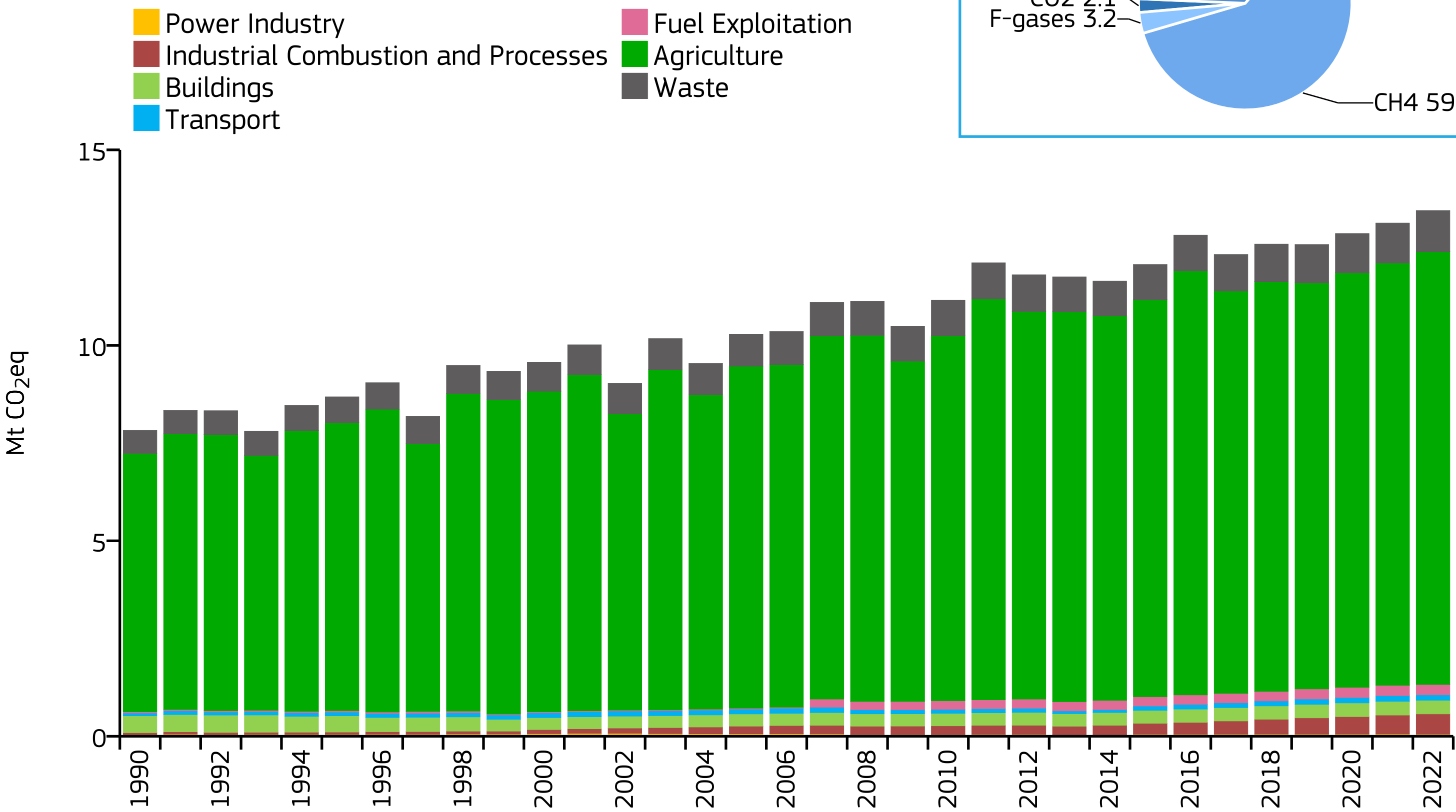
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+187%	+110%	+4%
Industrial Combustion and Processes	+190%	+149%	+4%
Buildings	+84%	+195%	+4%
Transport	+225%	+128%	+4%
Fuel Exploitation	> +300%	-32%	-28%
Agriculture	n/a	n/a	n/a
Waste	+161%	+34%	+1%
All sectors	+181%	+113%	+4%

Central African Republic

GHG % in 2022



GHG emissions by sector

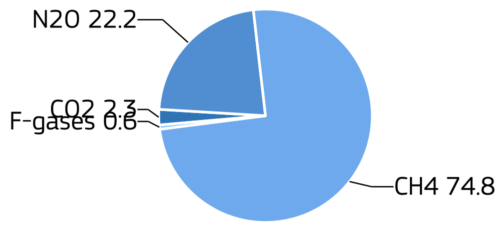


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	13.448	2.620	2.942	5.132M
2015	12.070	2.655	3.150	4.546M
2005	10.289	2.493	2.481	4.128M
1990	7.824	2.661	2.320	2.940M

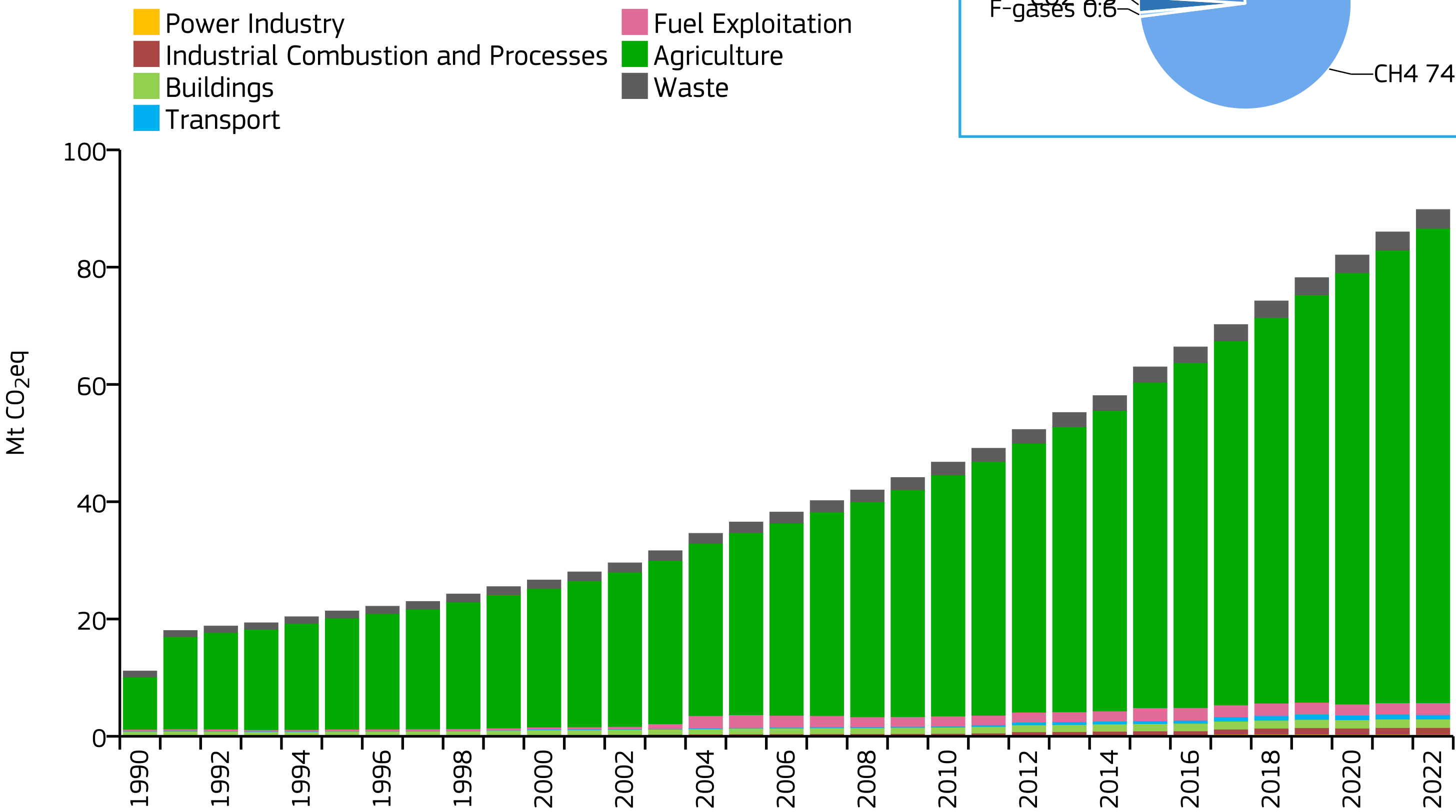
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+33%	-14%	-7%
Industrial Combustion and Processes	> +300%	+164%	+7%
Buildings	-19%	+12%	0%
Transport	+88%	+10%	-6%
Fuel Exploitation	> +300%	> +300%	0%
Agriculture	+67%	+27%	+3%
Waste	+80%	+28%	+2%
All sectors	+72%	+31%	+2%

Chad

GHG % in 2022



GHG emissions by sector

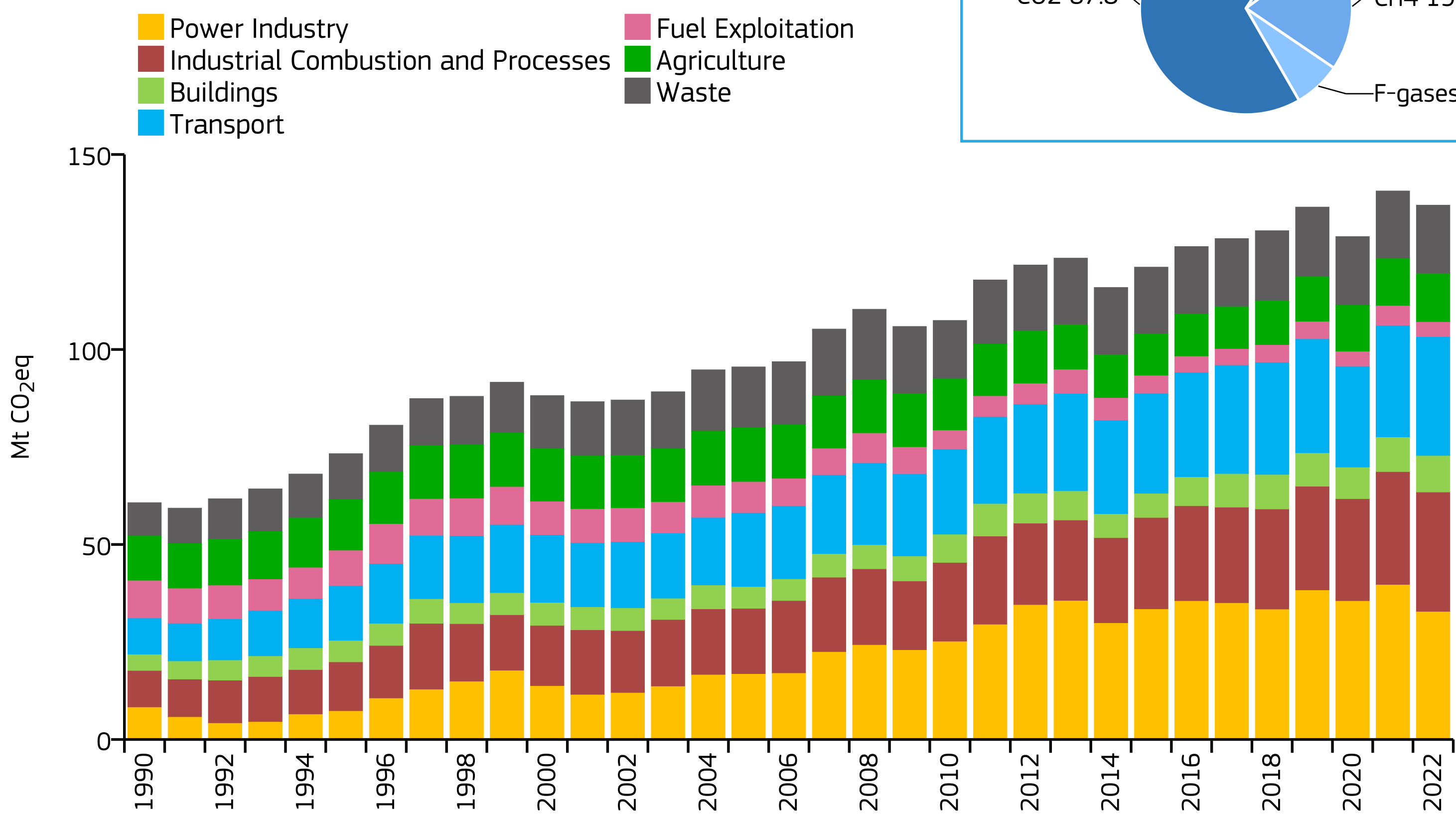


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	89.837	5.206	3.588	17.255M
2015	63.000	4.497	2.404	14.009M
2005	36.548	3.630	2.237	10.067M
1990	11.136	1.870	1.860	5.957M

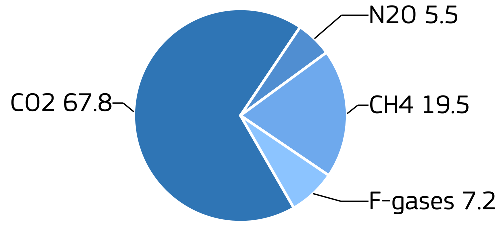
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-7%
Industrial Combustion and Processes	> +300%	+273%	+3%
Buildings	+118%	+50%	-1%
Transport	> +300%	> +300%	-6%
Fuel Exploitation	> +300%	-7%	+3%
Agriculture	> +300%	+161%	+5%
Waste	+214%	+76%	+3%
All sectors	> +300%	+146%	+4%

Chile

GHG emissions by sector



GHG % in 2022

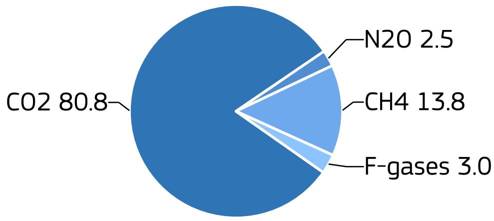


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	137.011	7.314	0.270	18.734M
2015	121.124	6.819	0.277	17.763M
2005	95.547	5.917	0.321	16.147M
1990	60.743	4.587	0.469	13.242M

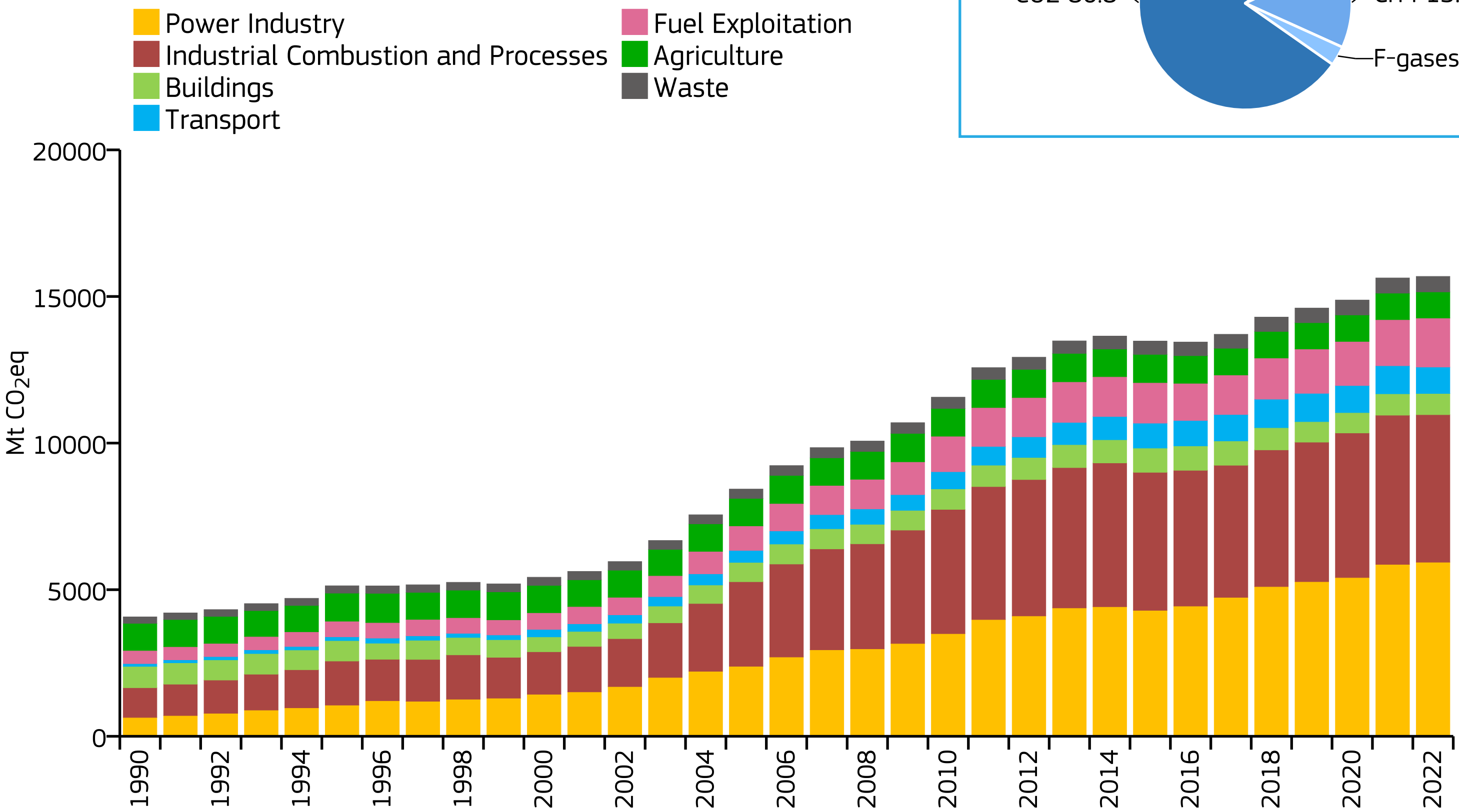
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+294%	+95%	-17%
Industrial Combustion and Processes	+227%	+83%	+6%
Buildings	+124%	+67%	+5%
Transport	+229%	+61%	+7%
Fuel Exploitation	-60%	-52%	-25%
Agriculture	+8%	-11%	+3%
Waste	+108%	+13%	+1%
All sectors	+126%	+43%	-3%

China

GHG % in 2022



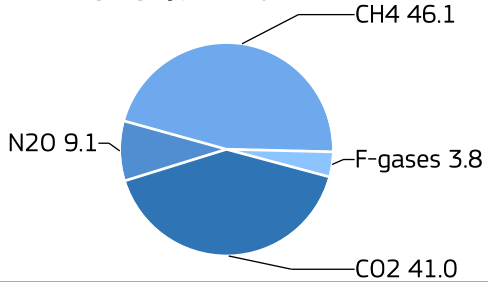
GHG emissions by sector



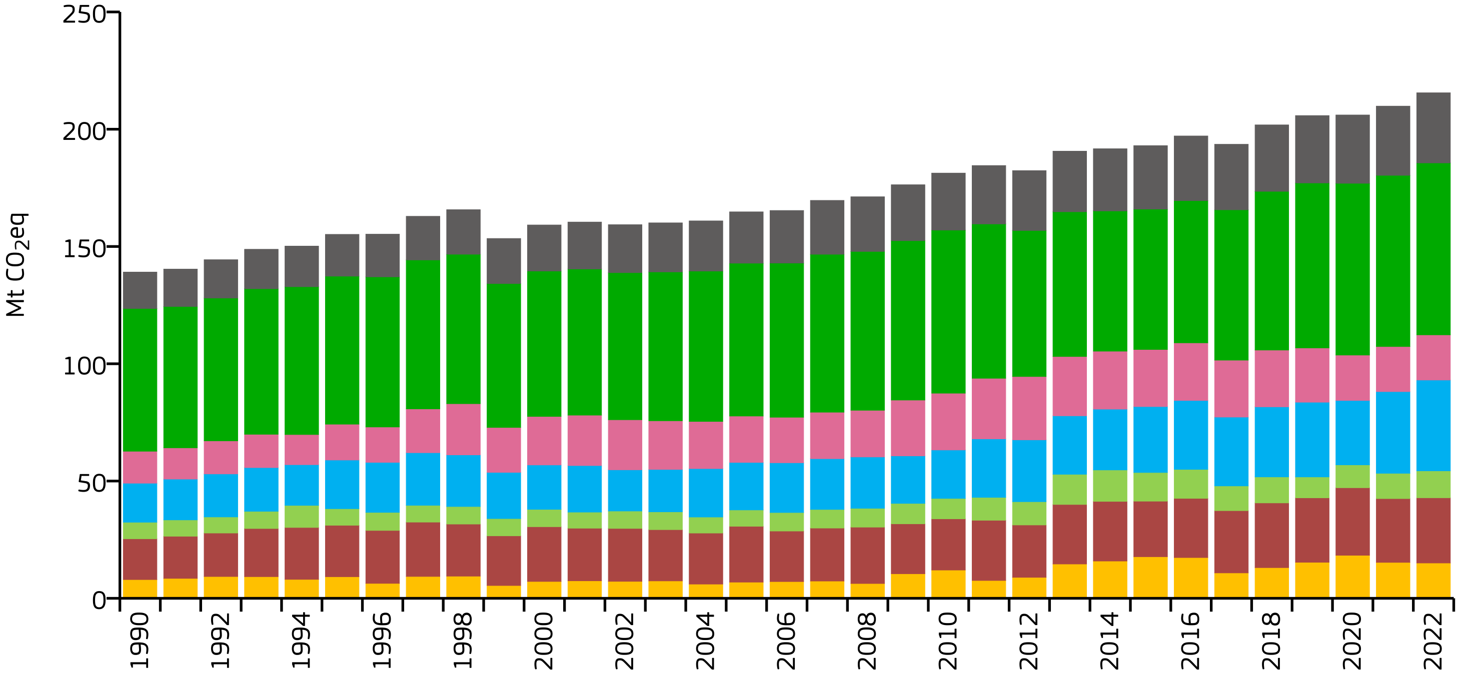
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	15684.627	10.954	0.611	1.432G
2015	13479.880	9.649	0.775	1.397G
2005	8431.922	6.380	1.212	1.322G
1990	4073.563	3.474	2.520	1.172G

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+149%	+1%
Industrial Combustion and Processes	> +300%	+74%	-1%
Buildings	-1%	+10%	-1%
Transport	> +300%	+121%	-6%
Fuel Exploitation	+273%	+100%	+6%
Agriculture	-3%	-5%	-1%
Waste	+137%	+65%	+1%
All sectors	+285%	+86%	0%

Colombia



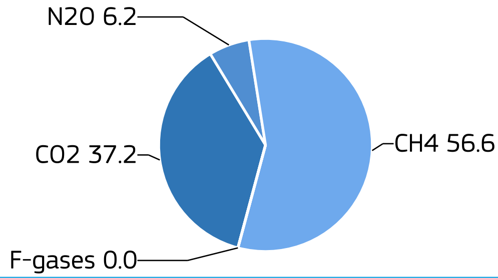
GHG emissions by sector



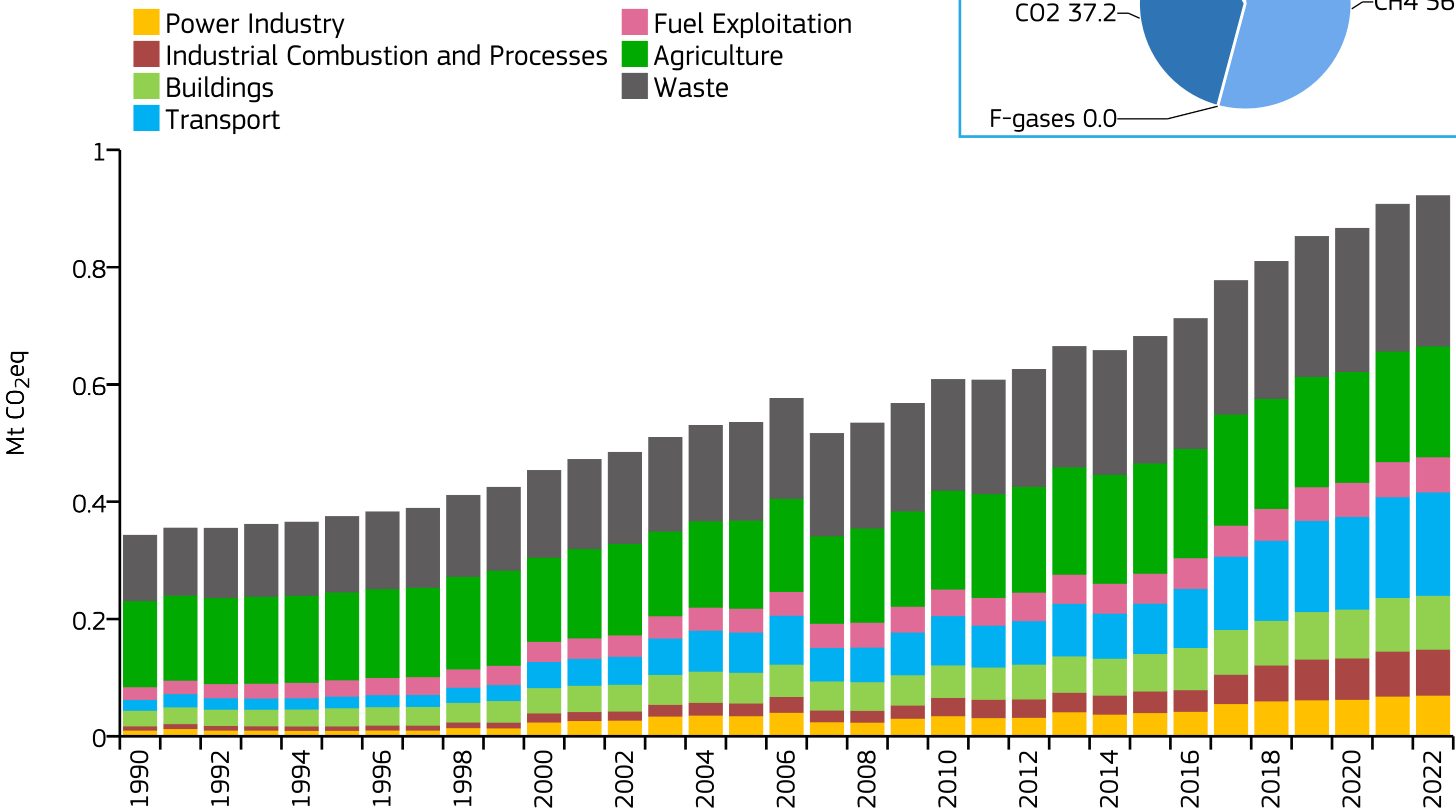
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	215.537	4.233	0.265	50.918M
2015	193.010	4.002	0.288	48.229M
2005	164.780	3.807	0.384	43.286M
1990	139.104	4.059	0.506	34.272M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+89%	+118%	-2%
Industrial Combustion and Processes	+60%	+17%	+2%
Buildings	+63%	+65%	+6%
Transport	+133%	+91%	+11%
Fuel Exploitation	+41%	-3%	0%
Agriculture	+20%	+12%	0%
Waste	+92%	+37%	+1%
All sectors	+55%	+31%	+3%

Comoros



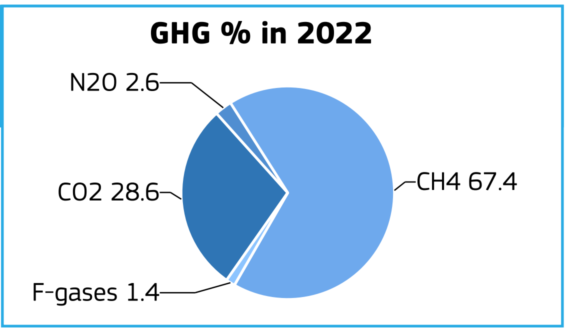
GHG emissions by sector



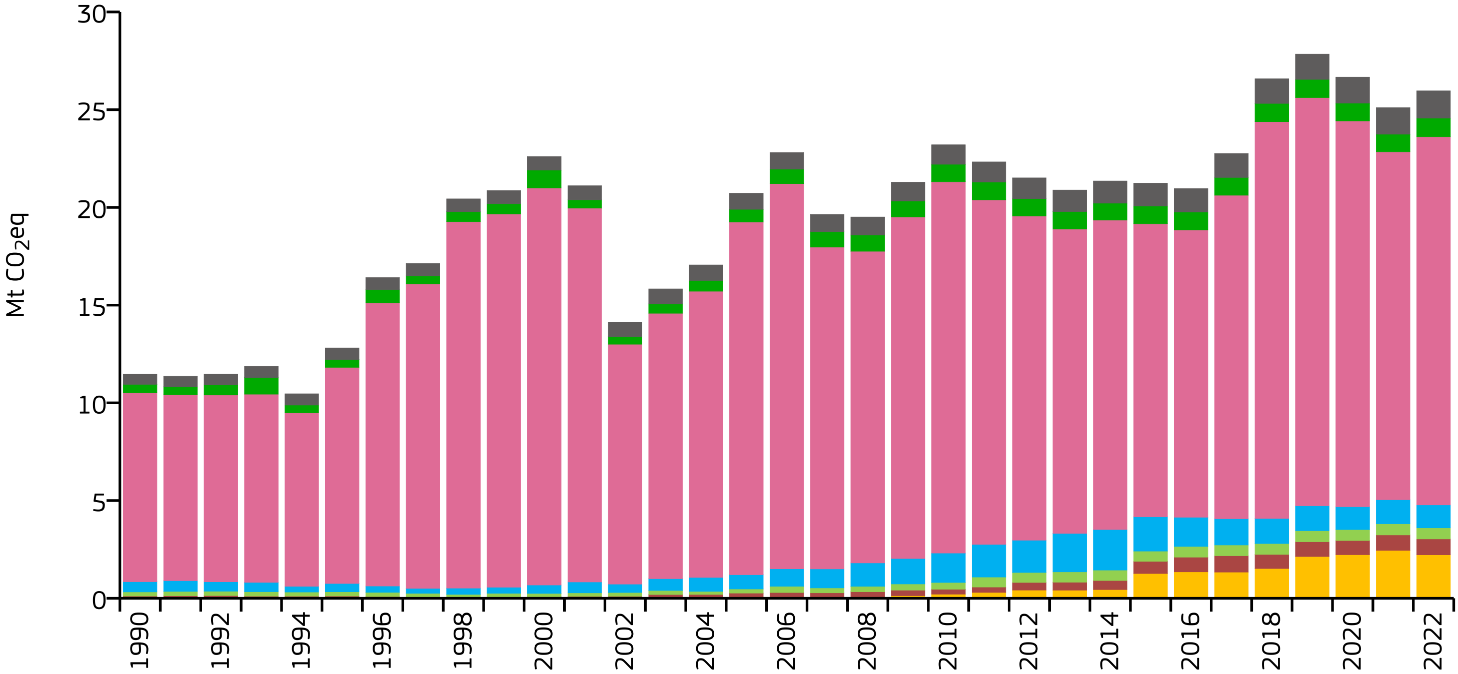
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.922	1.017	0.340	907.000k
2015	0.682	0.878	0.297	777.424k
2005	0.536	0.876	0.311	611.627k
1990	0.343	0.834	0.272	411.594k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+102%	+2%
Industrial Combustion and Processes	> +300%	+260%	+2%
Buildings	+245%	+76%	+1%
Transport	> +300%	+156%	+3%
Fuel Exploitation	+175%	+47%	0%
Agriculture	+29%	+26%	0%
Waste	+129%	+54%	+2%
All sectors	+169%	+72%	+2%

Congo



GHG emissions by sector

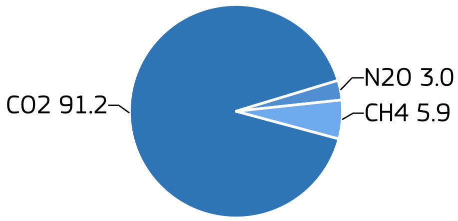


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	25.962	4.339	1.355	5.984M
2015	21.237	4.251	0.837	4.996M
2005	20.723	5.573	1.234	3.718M
1990	11.466	4.698	0.960	2.440M

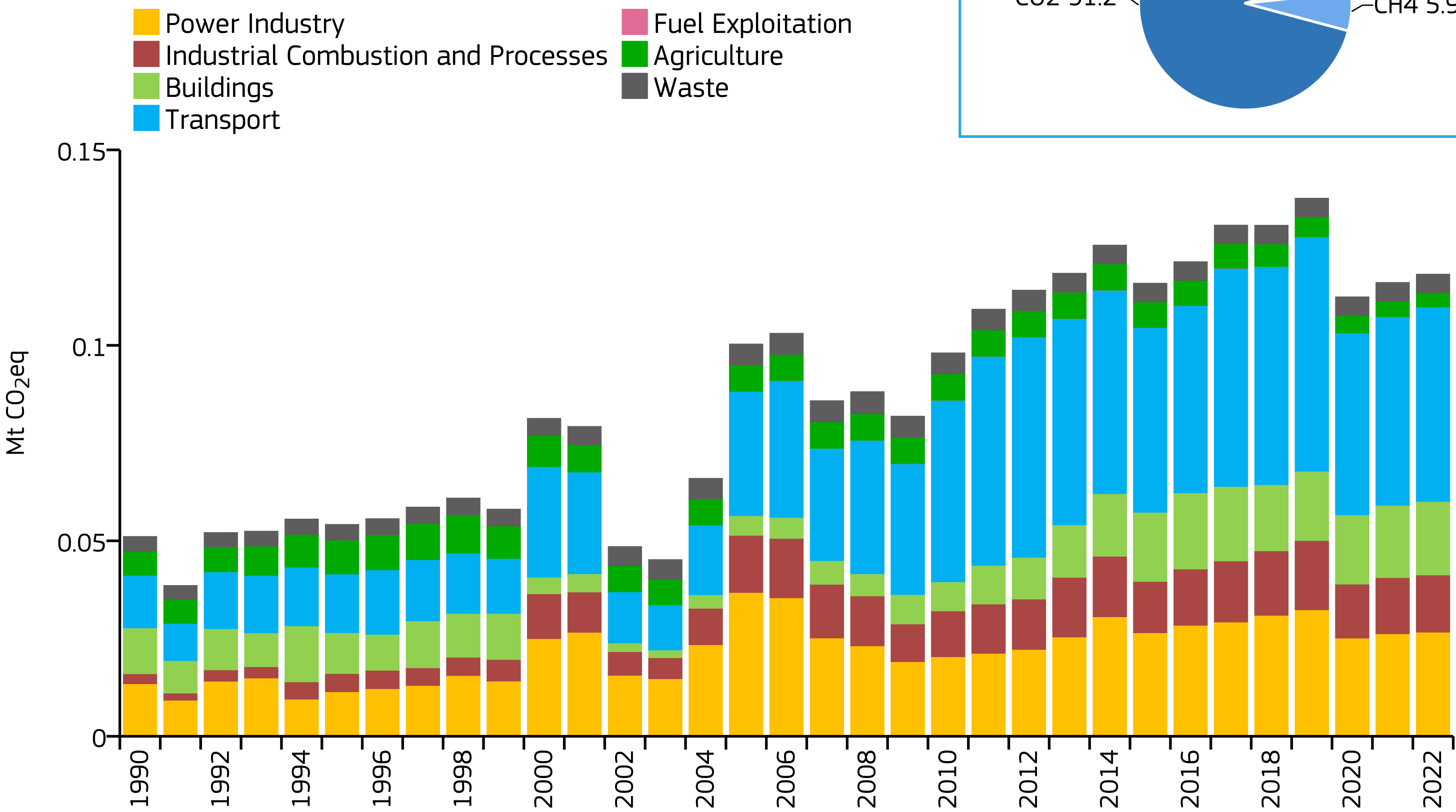
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-9%
Industrial Combustion and Processes	> +300%	+267%	+3%
Buildings	+168%	+169%	-1%
Transport	+125%	+61%	-5%
Fuel Exploitation	+95%	+4%	+6%
Agriculture	+120%	+46%	+6%
Waste	+169%	+70%	+2%
All sectors	+126%	+25%	+3%

Cook Islands

GHG % in 2022



GHG emissions by sector

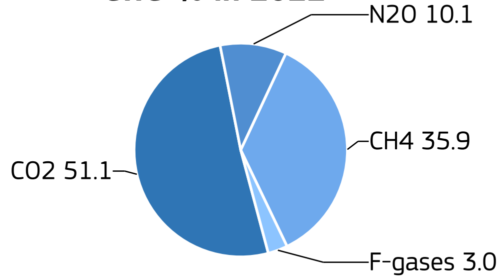


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.118	6.955	n/a	17.000k
2015	0.116	6.643	n/a	17.449k
2005	0.100	5.092	n/a	19.710k
1990	0.051	2.787	n/a	18.356k

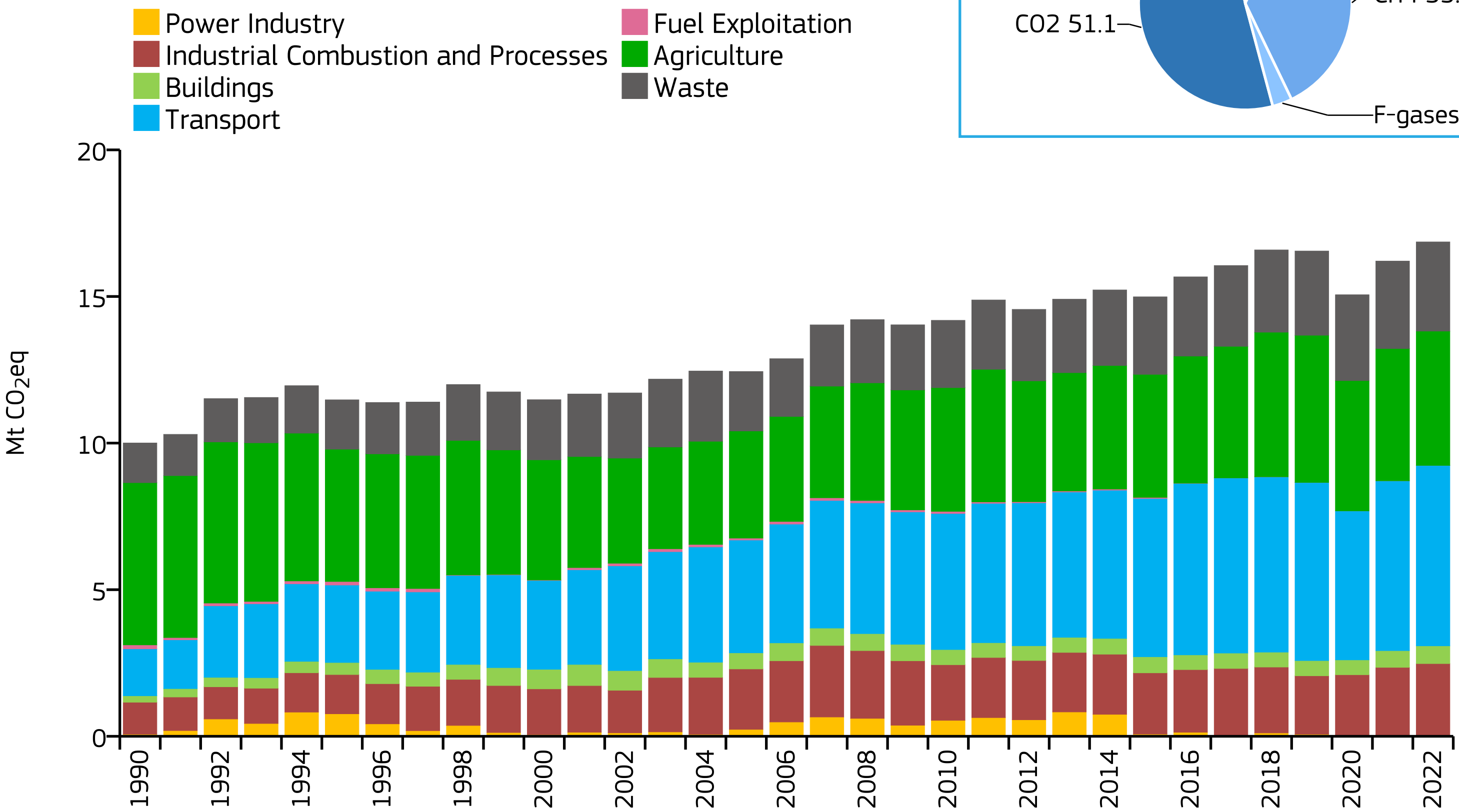
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+98%	-28%	+2%
Industrial Combustion and Processes	> +300%	0%	+2%
Buildings	+60%	+272%	+2%
Transport	+270%	+57%	+3%
Fuel Exploitation	n/a	+91%	+12%
Agriculture	-41%	-45%	-9%
Waste	+25%	-13%	0%
All sectors	+131%	+18%	+2%

Costa Rica

GHG % in 2022



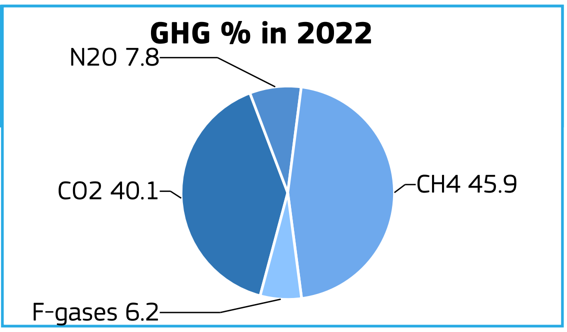
GHG emissions by sector



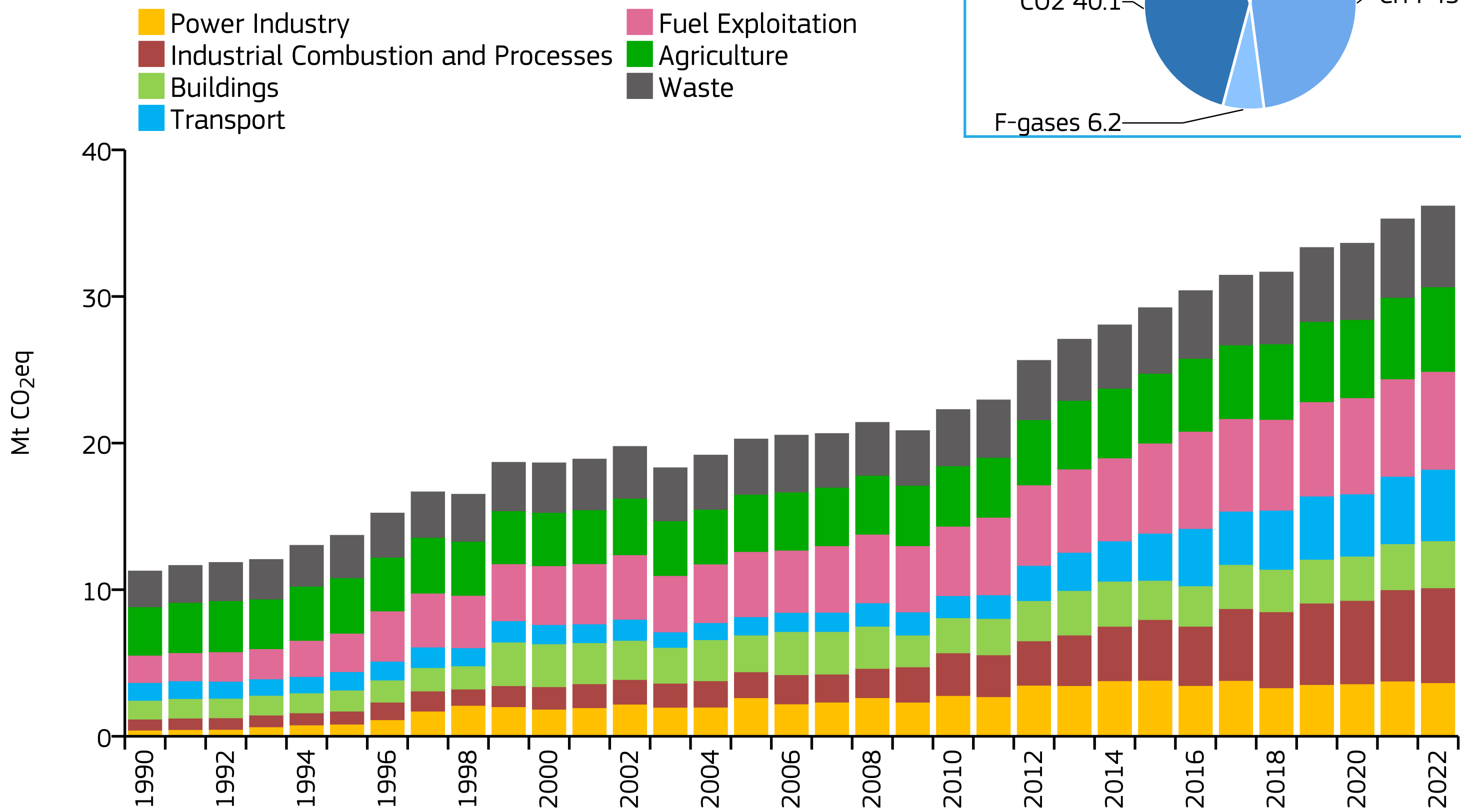
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	16.861	3.287	0.148	5.129M
2015	14.989	3.118	0.162	4.808M
2005	12.441	2.929	0.205	4.248M
1990	10.005	3.231	0.323	3.096M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-58%	-87%	+5%
Industrial Combustion and Processes	+124%	+19%	+6%
Buildings	+176%	+10%	+6%
Transport	+284%	+60%	+6%
Fuel Exploitation	-97%	-95%	0%
Agriculture	-17%	+25%	+2%
Waste	+125%	+50%	+2%
All sectors	+69%	+36%	+4%

Côte d'Ivoire



GHG emissions by sector

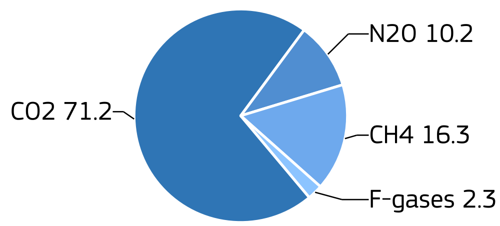


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	36.177	1.316	0.232	27.498M
2015	29.236	1.265	0.280	23.108M
2005	20.284	1.106	0.310	18.336M
1990	11.278	0.919	0.218	12.268M

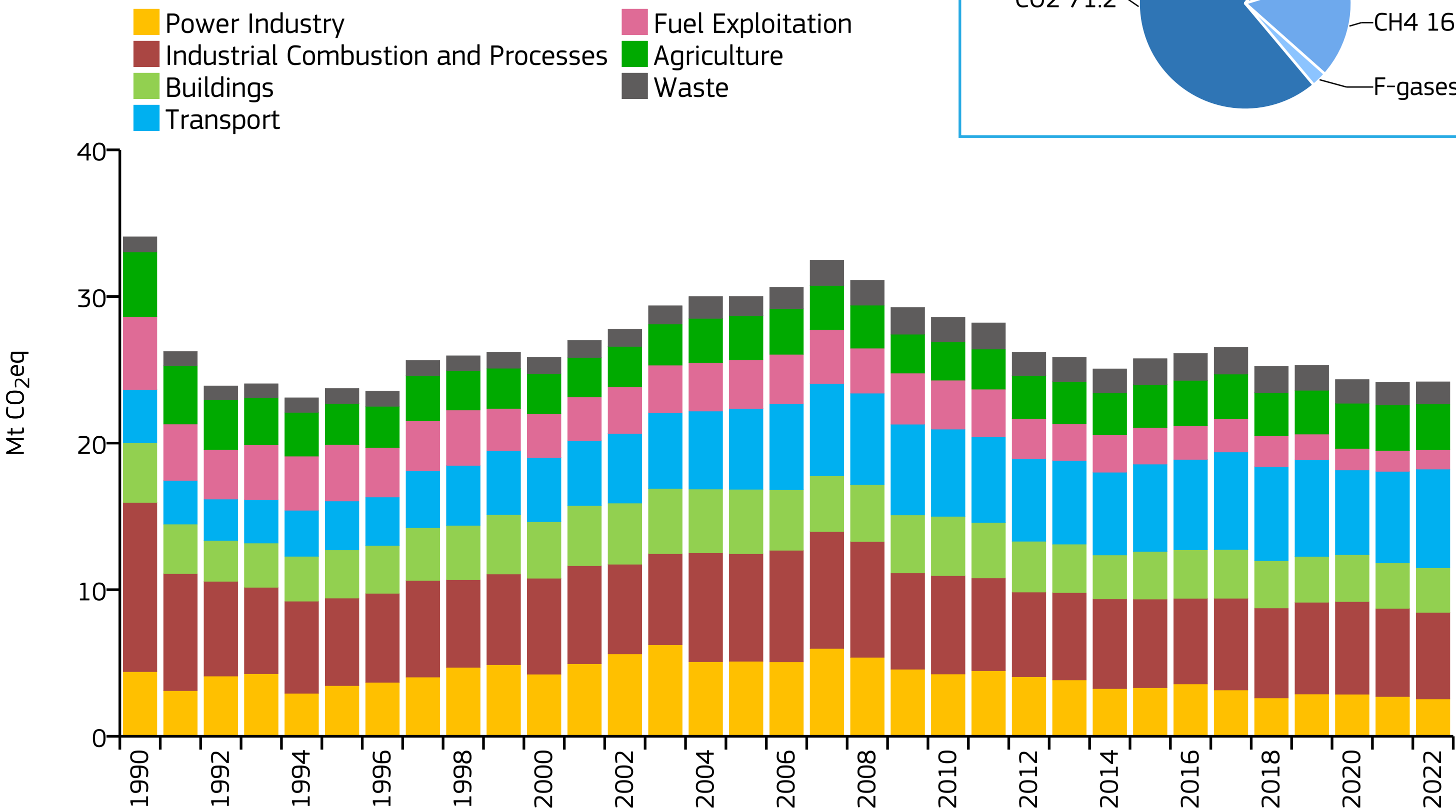
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+39%	-3%
Industrial Combustion and Processes	> +300%	+267%	+4%
Buildings	+152%	+28%	+2%
Transport	> +300%	+291%	+6%
Fuel Exploitation	+258%	+50%	0%
Agriculture	+75%	+48%	+4%
Waste	+125%	+46%	+3%
All sectors	+221%	+78%	+2%

Croatia

GHG % in 2022



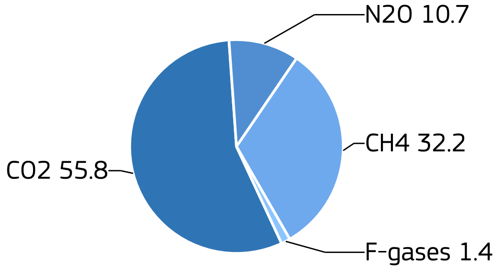
GHG emissions by sector



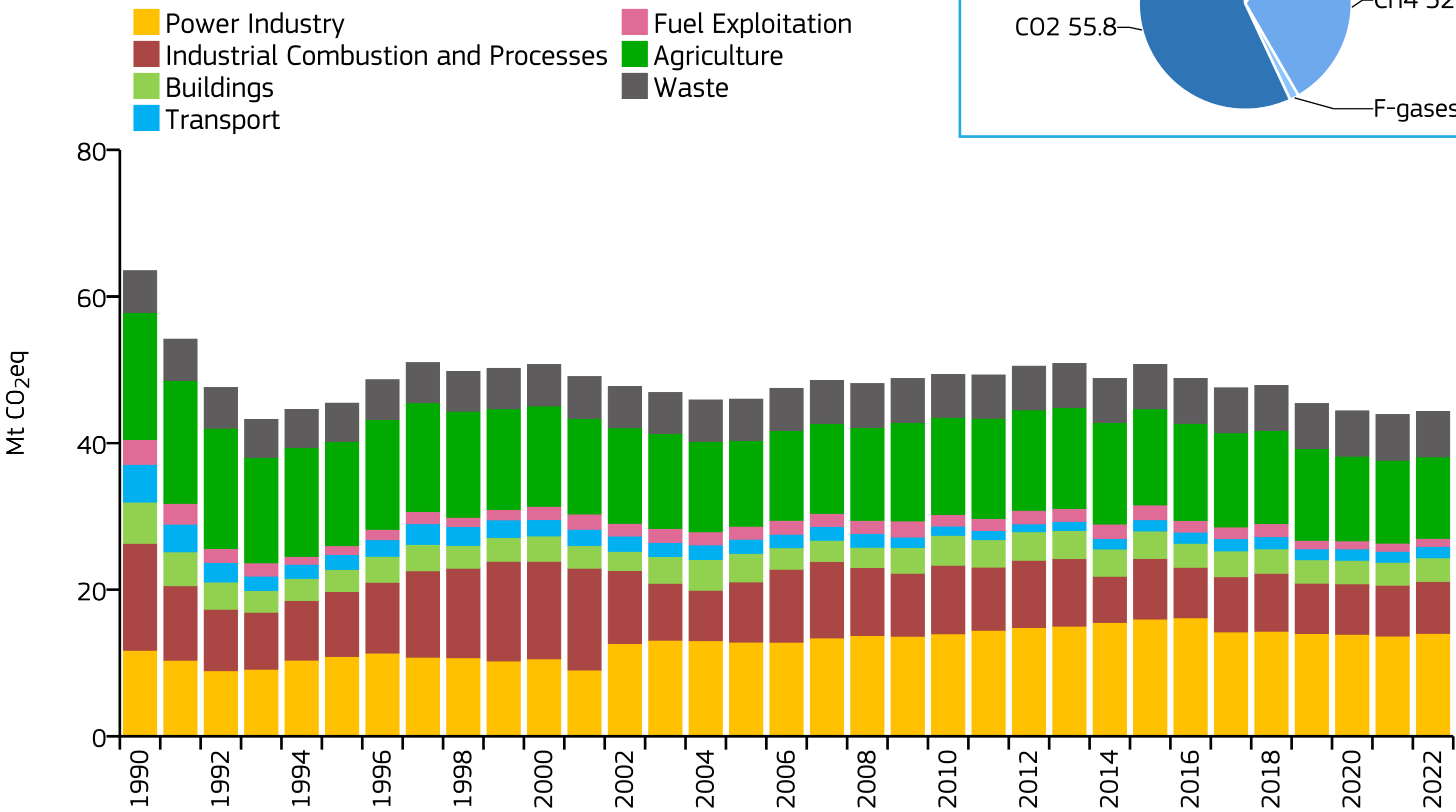
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	24.178	5.942	0.184	4.069M
2015	25.756	6.080	0.246	4.236M
2005	30.006	6.854	0.293	4.378M
1990	34.068	7.133	0.402	4.776M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-42%	-50%	-6%
Industrial Combustion and Processes	-49%	-20%	-2%
Buildings	-25%	-31%	-2%
Transport	+85%	+22%	+8%
Fuel Exploitation	-74%	-60%	-7%
Agriculture	-29%	+4%	0%
Waste	+46%	+15%	-3%
All sectors	-29%	-19%	0%

Cuba



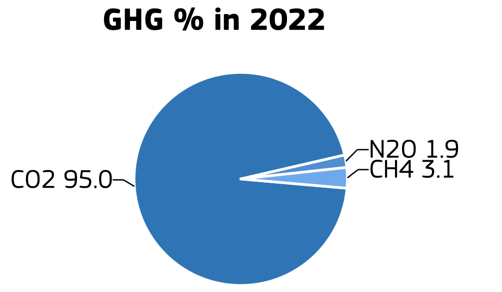
GHG emissions by sector



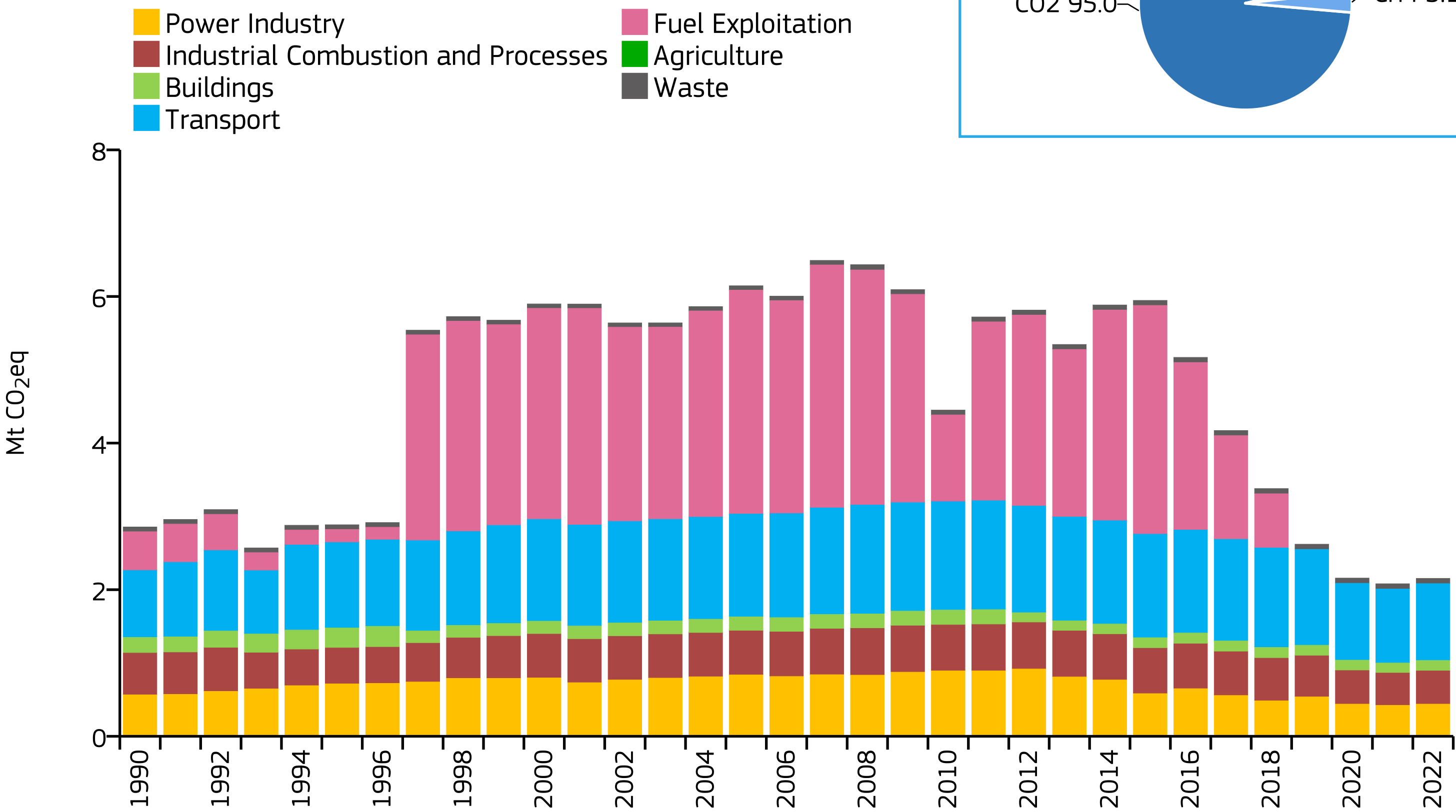
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	44.377	3.857	0.157	11.504M
2015	50.765	4.429	0.188	11.461M
2005	46.033	4.079	0.254	11.284M
1990	63.547	6.005	0.388	10.582M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+20%	+9%	+3%
Industrial Combustion and Processes	-51%	-14%	+2%
Buildings	-43%	-17%	+3%
Transport	-70%	-20%	+4%
Fuel Exploitation	-67%	-38%	-2%
Agriculture	-36%	-5%	-2%
Waste	+9%	+10%	0%
All sectors	-30%	-4%	+1%

Curaçao



GHG emissions by sector

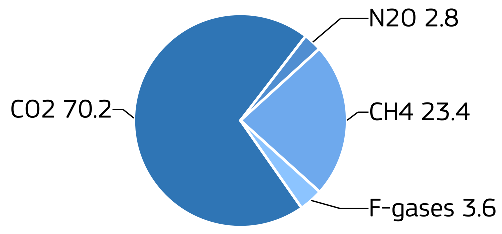


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.154	13.057	0.600	165.000k
2015	5.947	37.635	1.470	158.010k
2005	6.146	47.500	1.591	129.394k
1990	2.856	19.472	1.006	146.671k

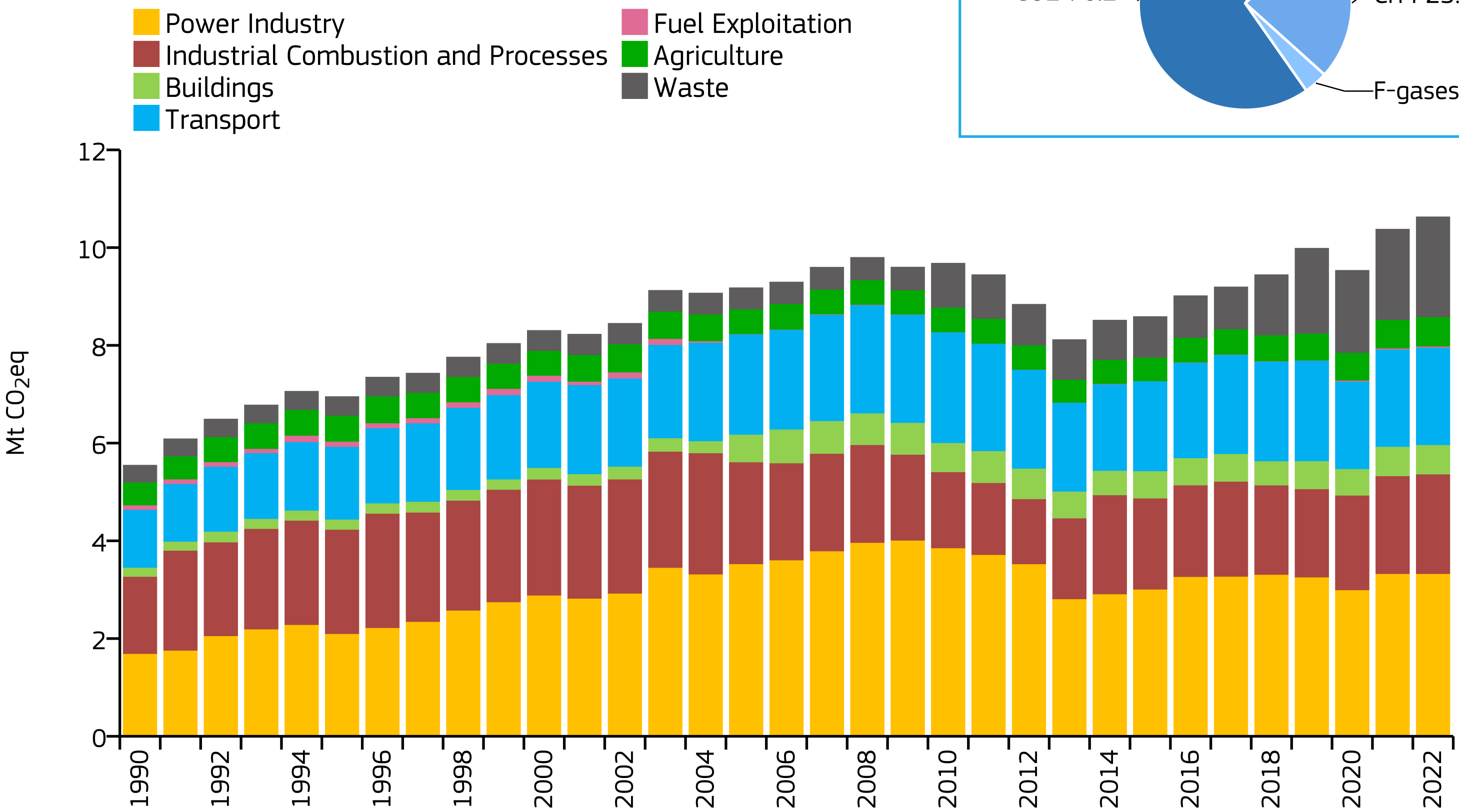
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-22%	-47%	+4%
Industrial Combustion and Processes	-20%	-25%	+3%
Buildings	-34%	-26%	+4%
Transport	+15%	-25%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+12%	+24%	+1%
All sectors	-25%	-65%	+4%

Cyprus

GHG % in 2022



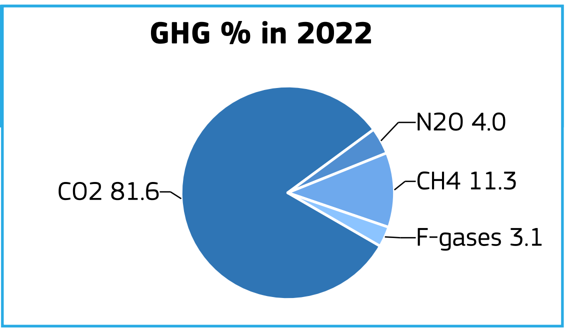
GHG emissions by sector



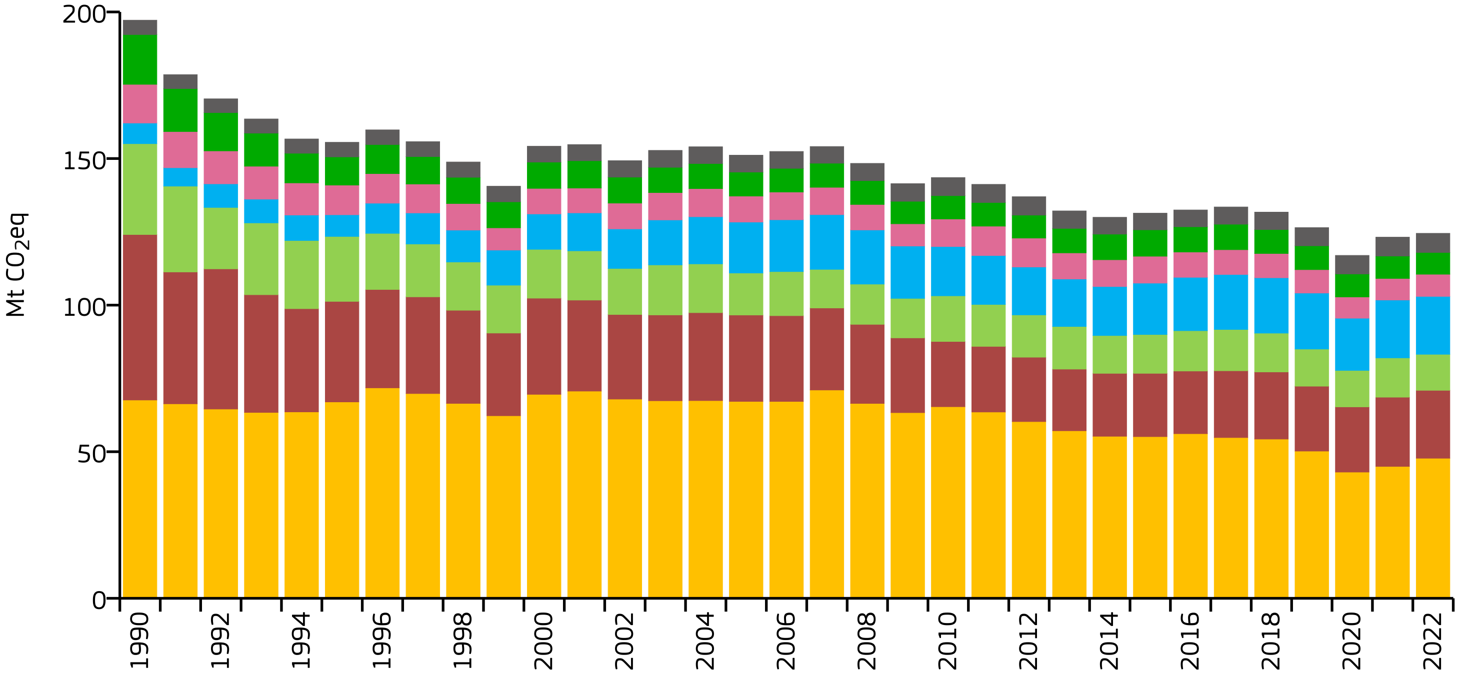
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	10.630	8.685	0.268	1.224M
2015	8.590	7.399	0.293	1.161M
2005	9.179	8.932	0.329	1.028M
1990	5.548	7.237	0.379	766.614k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+97%	-6%	0%
Industrial Combustion and Processes	+29%	-2%	+2%
Buildings	+223%	+6%	0%
Transport	+68%	-3%	0%
Fuel Exploitation	-71%	> +300%	+7%
Agriculture	+29%	+19%	+3%
Waste	> +300%	> +300%	+10%
All sectors	+92%	+16%	+2%

Czechia



GHG emissions by sector

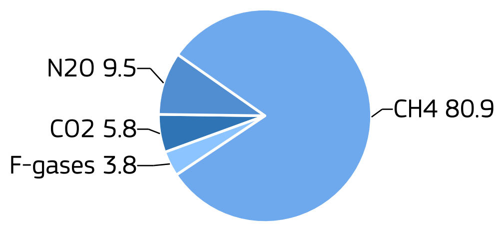


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	124.495	11.709	0.284	10.632M
2015	131.370	12.389	0.344	10.604M
2005	151.151	14.735	0.487	10.258M
1990	197.202	19.070	0.809	10.341M

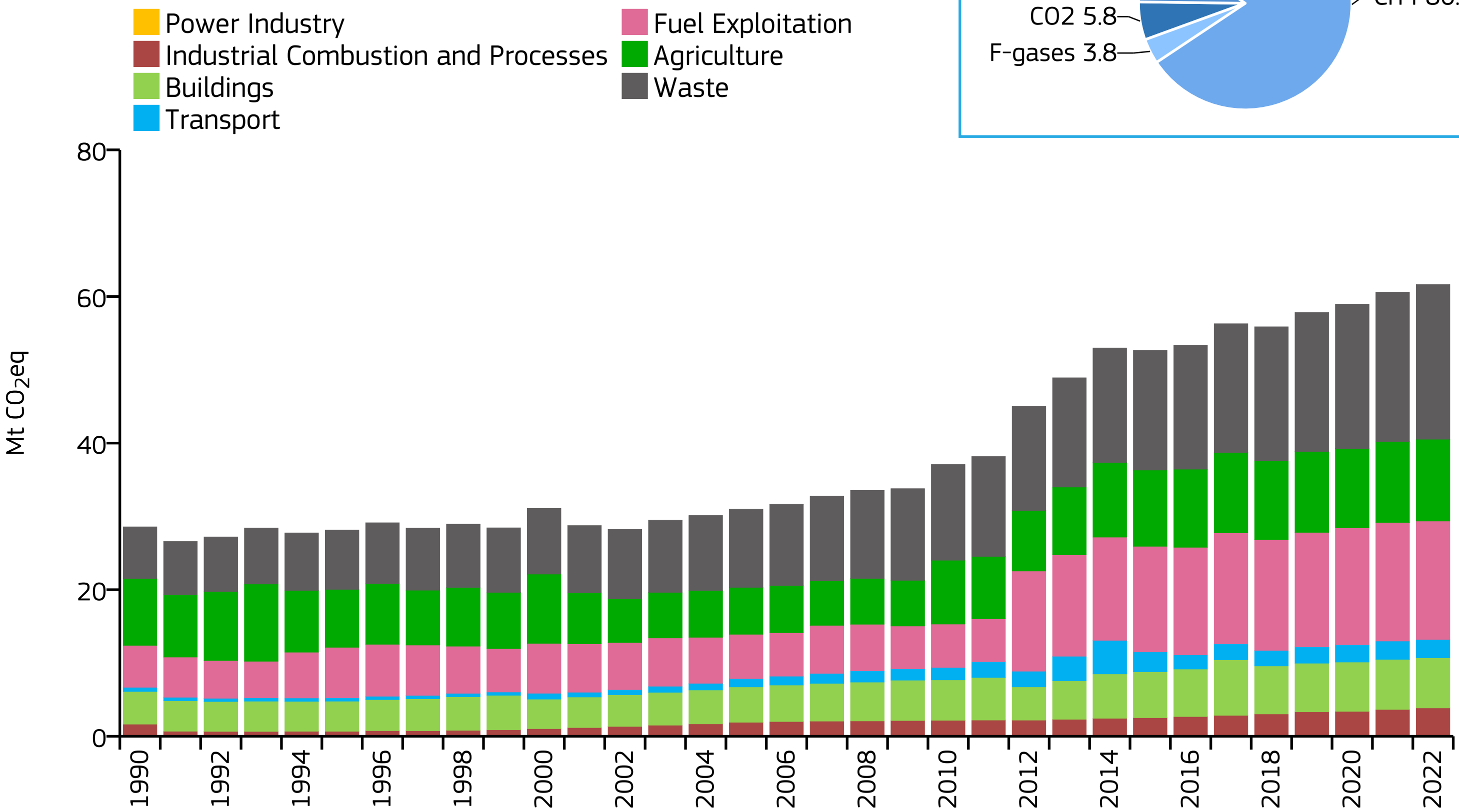
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-29%	-29%	+6%
Industrial Combustion and Processes	-59%	-21%	-2%
Buildings	-60%	-14%	-8%
Transport	+180%	+14%	0%
Fuel Exploitation	-43%	-15%	+2%
Agriculture	-56%	-9%	-2%
Waste	+33%	+13%	+1%
All sectors	-37%	-18%	+1%

Democratic Republic of the Congo

GHG % in 2022



GHG emissions by sector

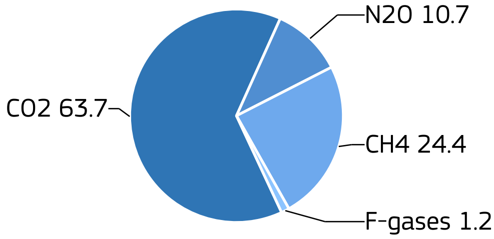


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	61.635	0.647	0.550	95.221M
2015	52.656	0.691	0.648	76.197M
2005	30.971	0.566	0.726	54.752M
1990	28.576	0.826	0.454	34.615M

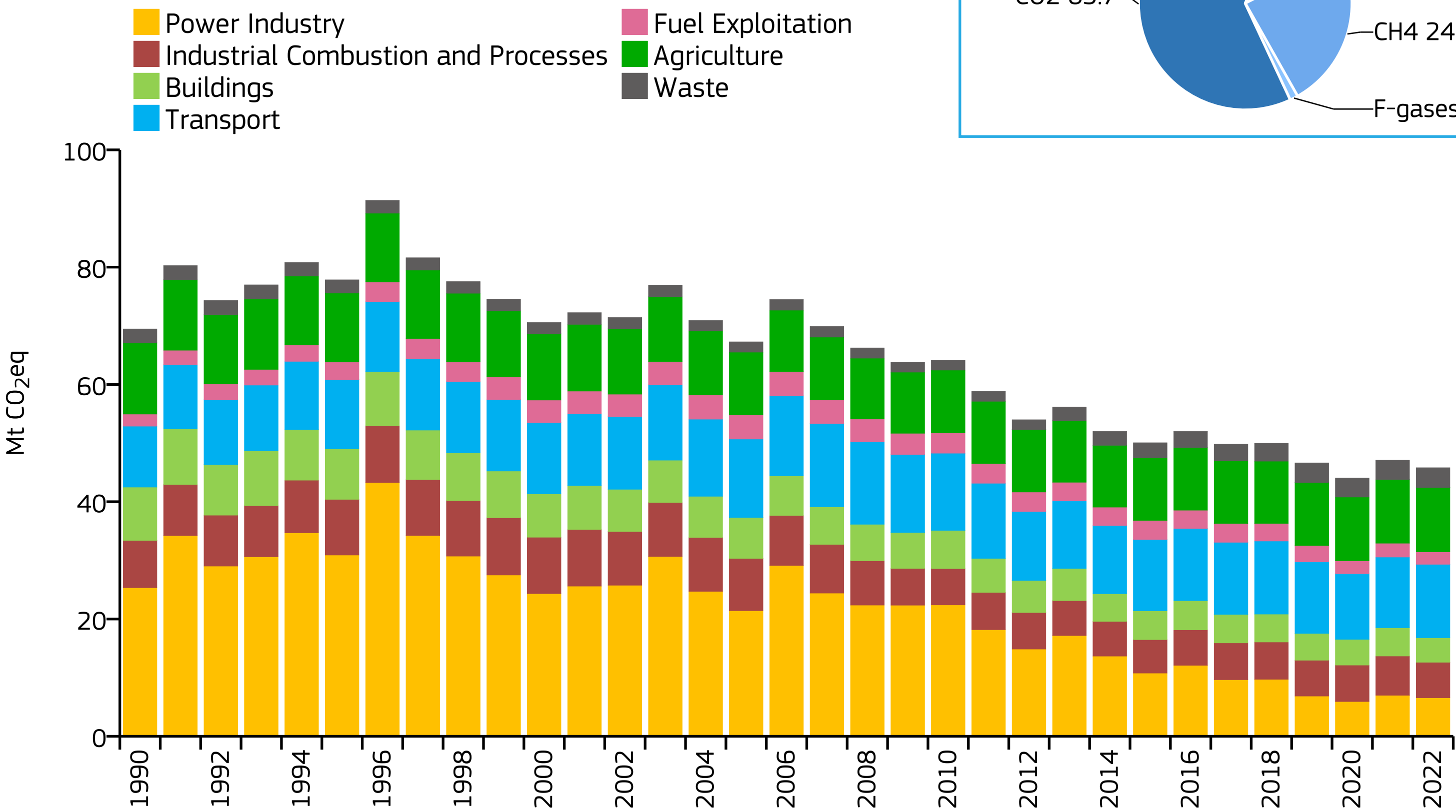
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-51%	+95%	-3%
Industrial Combustion and Processes	+136%	+102%	+6%
Buildings	+54%	+42%	0%
Transport	> +300%	+120%	-1%
Fuel Exploitation	+183%	+167%	0%
Agriculture	+23%	+75%	+1%
Waste	+199%	+98%	+4%
All sectors	+116%	+99%	+2%

Denmark

GHG % in 2022



GHG emissions by sector

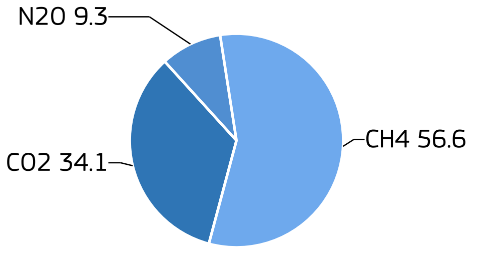


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.795	7.838	0.130	5.843M
2015	50.052	8.799	0.167	5.689M
2005	67.257	12.405	0.241	5.422M
1990	69.458	13.510	0.346	5.141M

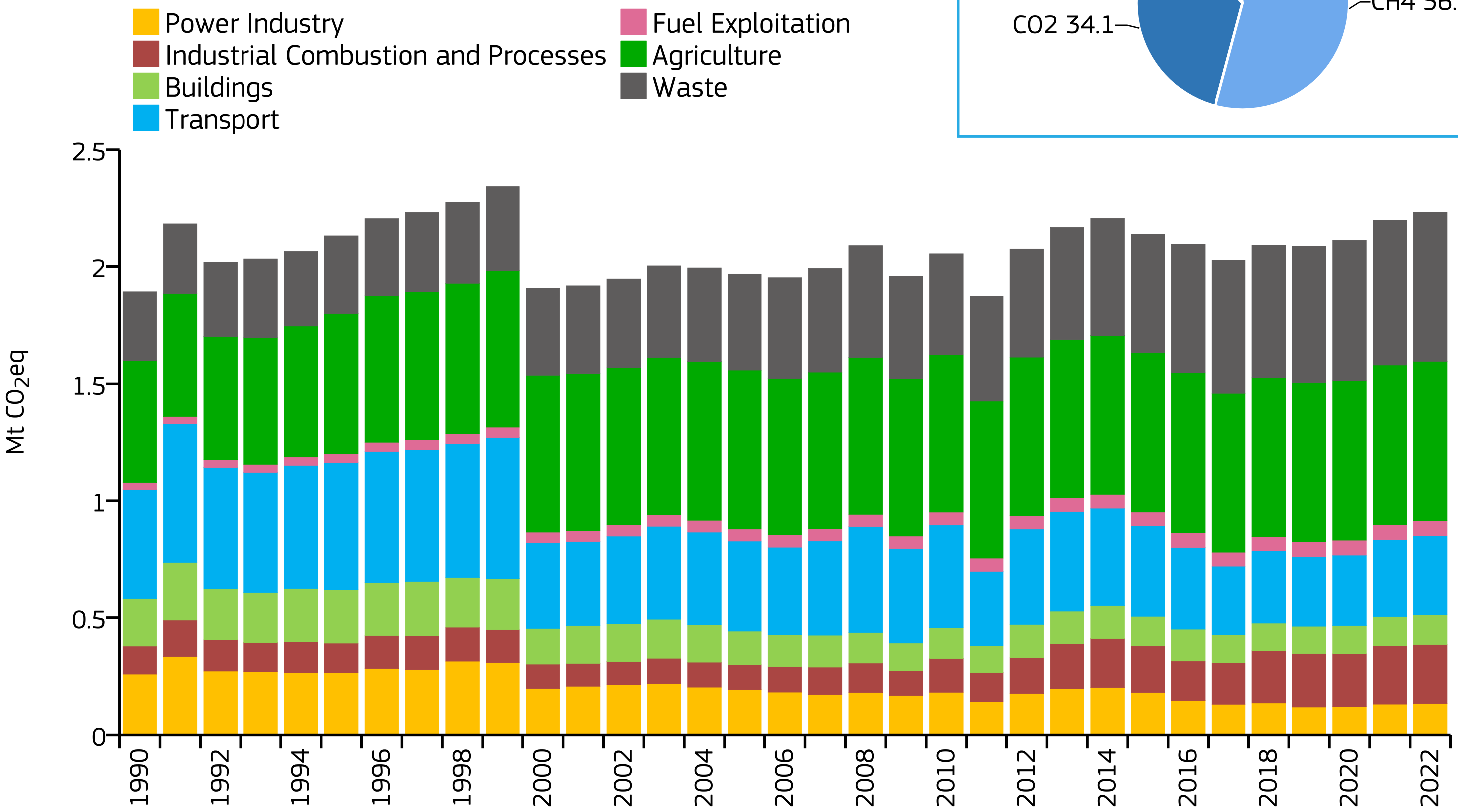
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-74%	-69%	-6%
Industrial Combustion and Processes	-25%	-32%	-9%
Buildings	-54%	-40%	-13%
Transport	+21%	-6%	+4%
Fuel Exploitation	+3%	-49%	-11%
Agriculture	-10%	+3%	+1%
Waste	+42%	+91%	+1%
All sectors	-34%	-32%	-3%

Djibouti

GHG % in 2022



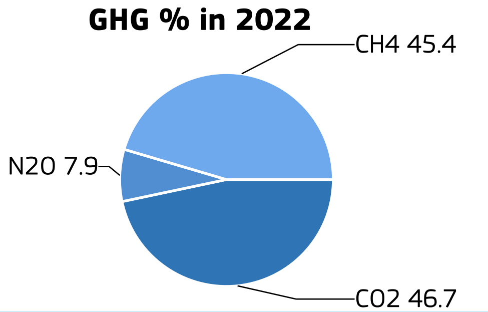
GHG emissions by sector



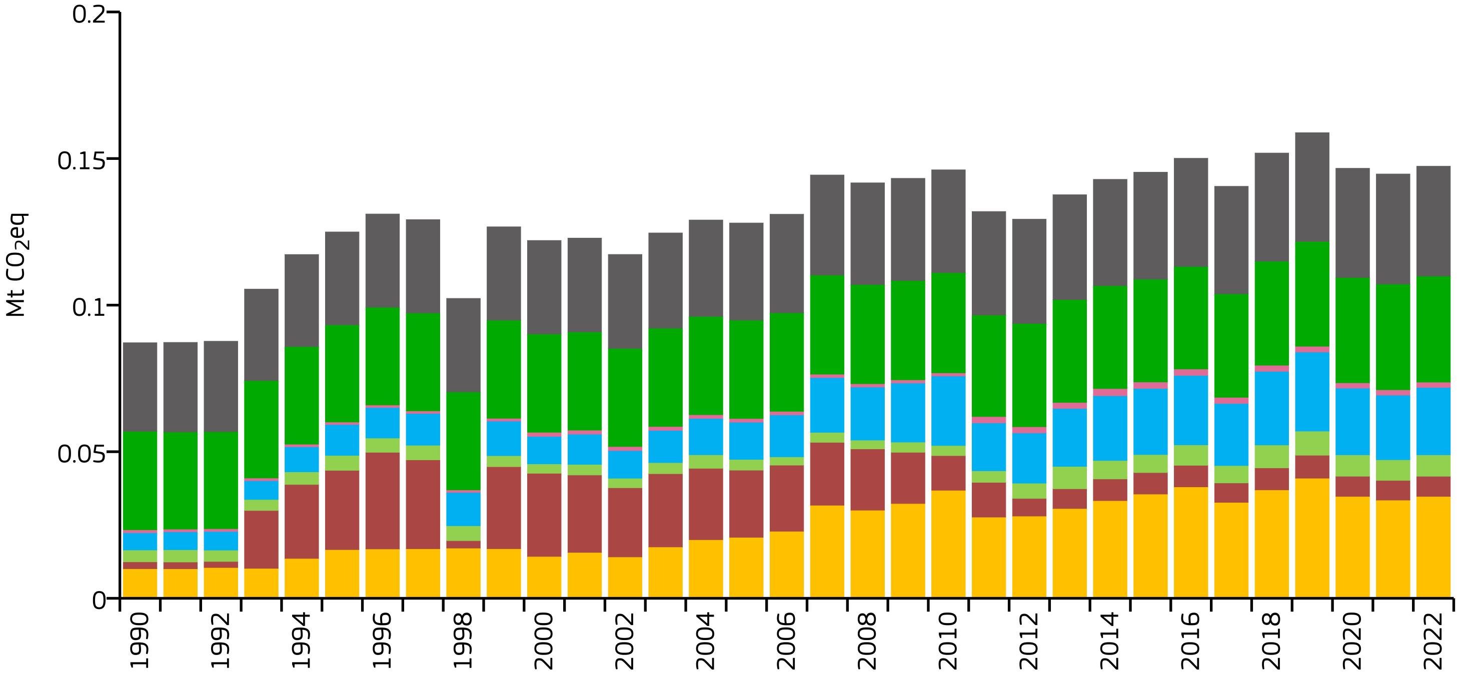
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.232	2.171	0.399	1.028M
2015	2.138	2.306	0.522	927.414k
2005	1.968	2.513	0.653	783.254k
1990	1.893	3.206	0.936	590.398k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-48%	-31%	+2%
Industrial Combustion and Processes	+110%	+139%	+1%
Buildings	-38%	-12%	+1%
Transport	-27%	-12%	+3%
Fuel Exploitation	+120%	+25%	0%
Agriculture	+31%	0%	0%
Waste	+116%	+55%	+3%
All sectors	+18%	+13%	+2%

Dominica



GHG emissions by sector

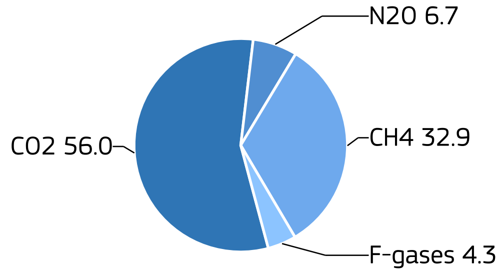


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.147	1.965	0.176	75.000k
2015	0.145	1.987	0.172	73.162k
2005	0.128	1.813	0.179	70.627k
1990	0.087	1.229	0.160	70.926k

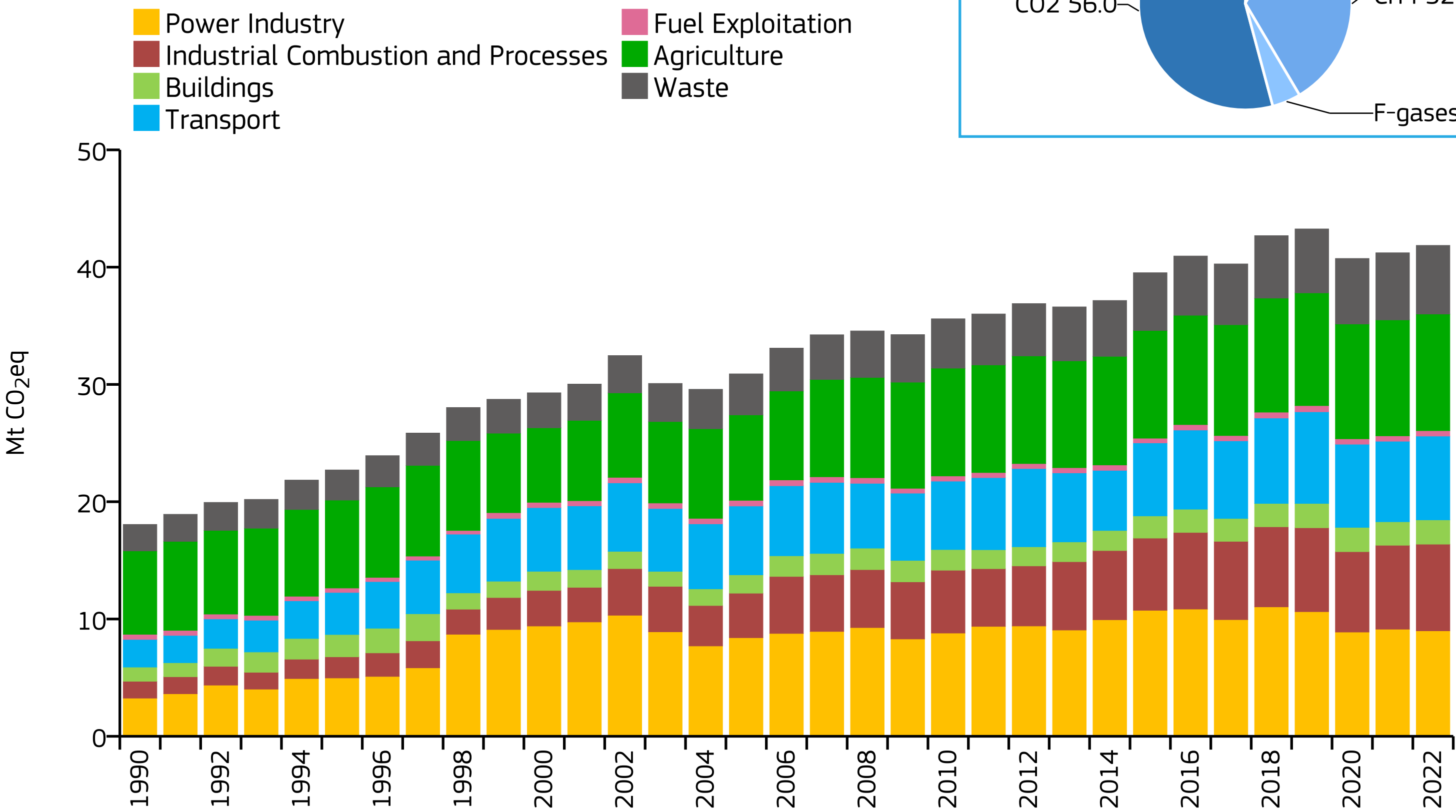
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+244%	+67%	+4%
Industrial Combustion and Processes	+196%	-70%	+3%
Buildings	+81%	+99%	+3%
Transport	+290%	+81%	+4%
Fuel Exploitation	+82%	+48%	0%
Agriculture	+8%	+8%	0%
Waste	+24%	+13%	0%
All sectors	+69%	+15%	+2%

Dominican Republic

GHG % in 2022



GHG emissions by sector

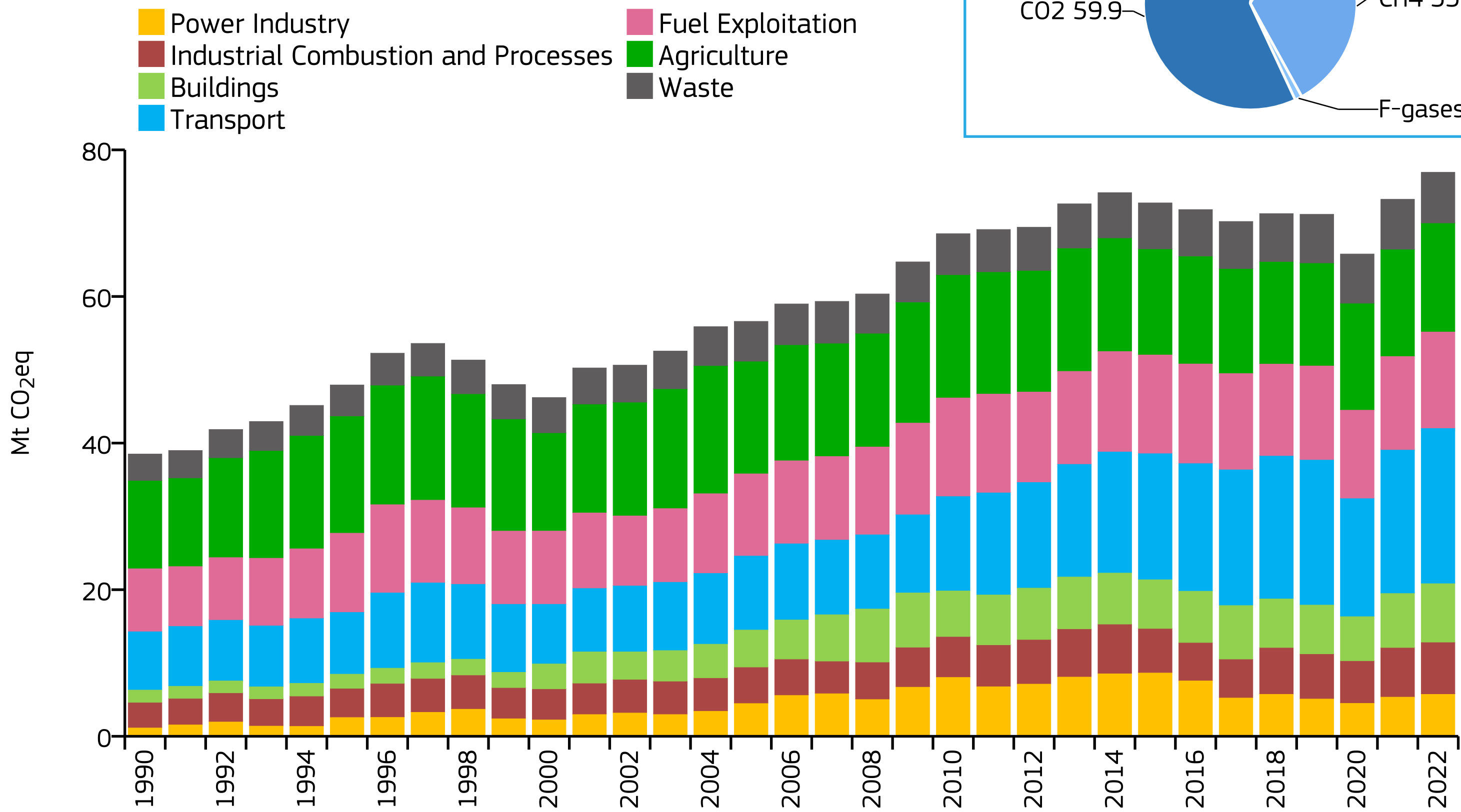


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	41.858	3.696	0.193	11.324M
2015	39.528	3.754	0.251	10.528M
2005	30.906	3.346	0.330	9.238M
1990	18.067	2.515	0.408	7.184M

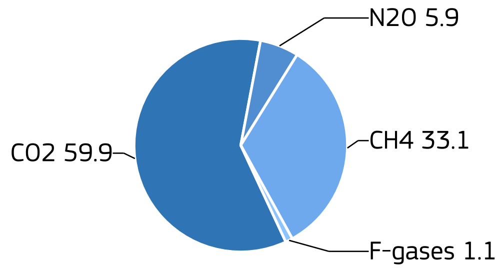
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+176%	+7%	-2%
Industrial Combustion and Processes	> +300%	+95%	+3%
Buildings	+71%	+33%	+3%
Transport	+203%	+22%	+4%
Fuel Exploitation	+4%	-5%	+1%
Agriculture	+40%	+37%	+1%
Waste	+159%	+67%	+2%
All sectors	+132%	+35%	+2%

Ecuador

GHG emissions by sector



GHG % in 2022

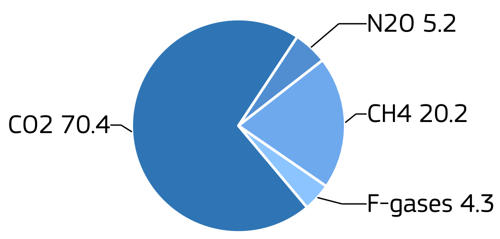


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	76.944	4.323	0.394	17.800M
2015	72.770	4.507	0.377	16.144M
2005	56.605	4.121	0.431	13.735M
1990	38.509	3.769	0.454	10.218M

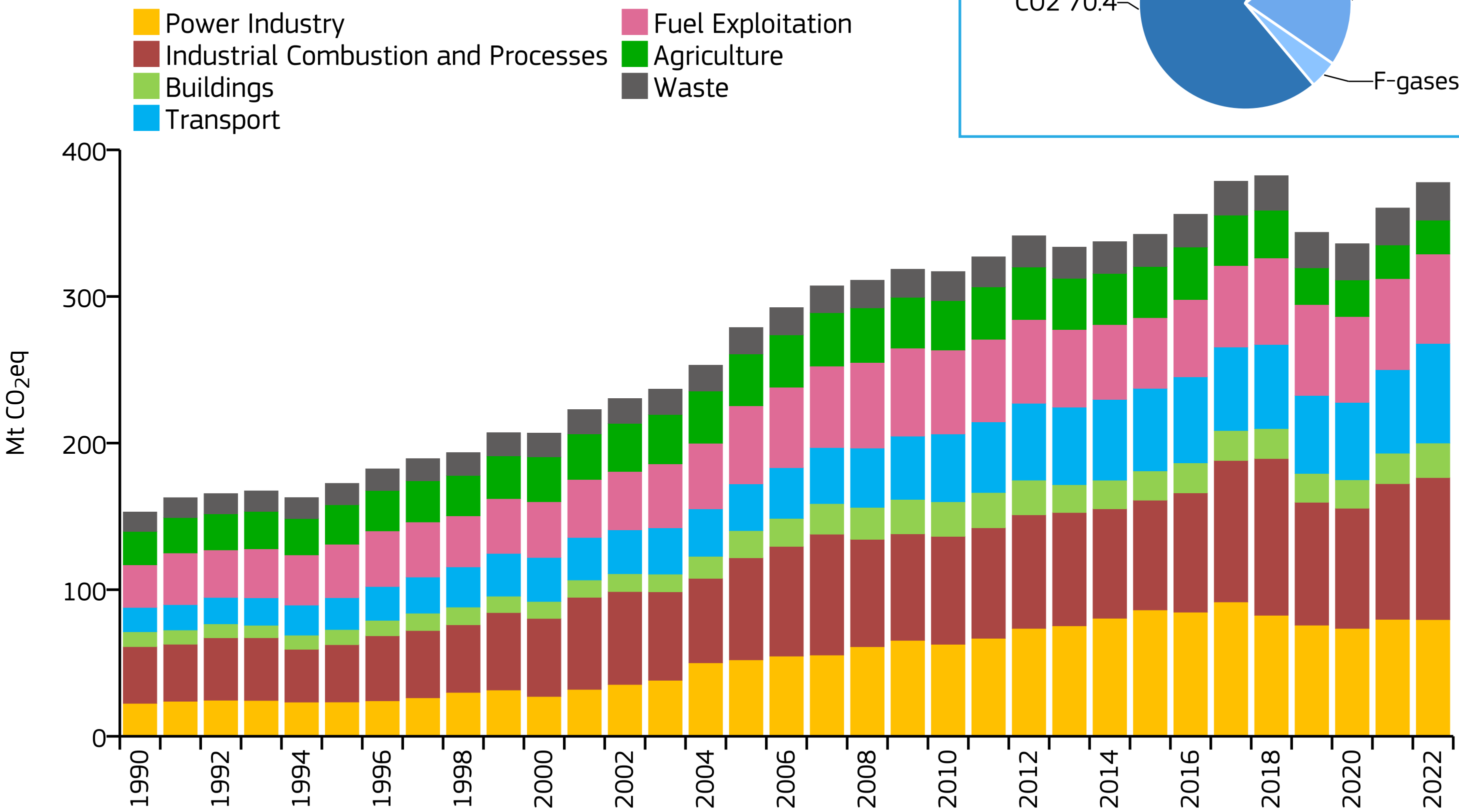
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+28%	+7%
Industrial Combustion and Processes	+106%	+44%	+5%
Buildings	> +300%	+57%	+8%
Transport	+166%	+110%	+8%
Fuel Exploitation	+53%	+17%	+3%
Agriculture	+24%	-3%	+2%
Waste	+92%	+27%	+1%
All sectors	+100%	+36%	+5%

Egypt

GHG % in 2022



GHG emissions by sector

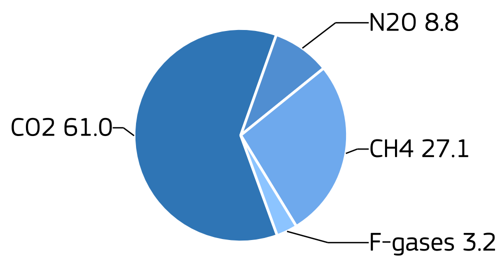


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	377.780	3.550	0.266	106.416M
2015	342.429	3.651	0.333	93.778M
2005	278.860	3.632	0.417	76.778M
1990	153.021	2.665	0.425	57.412M

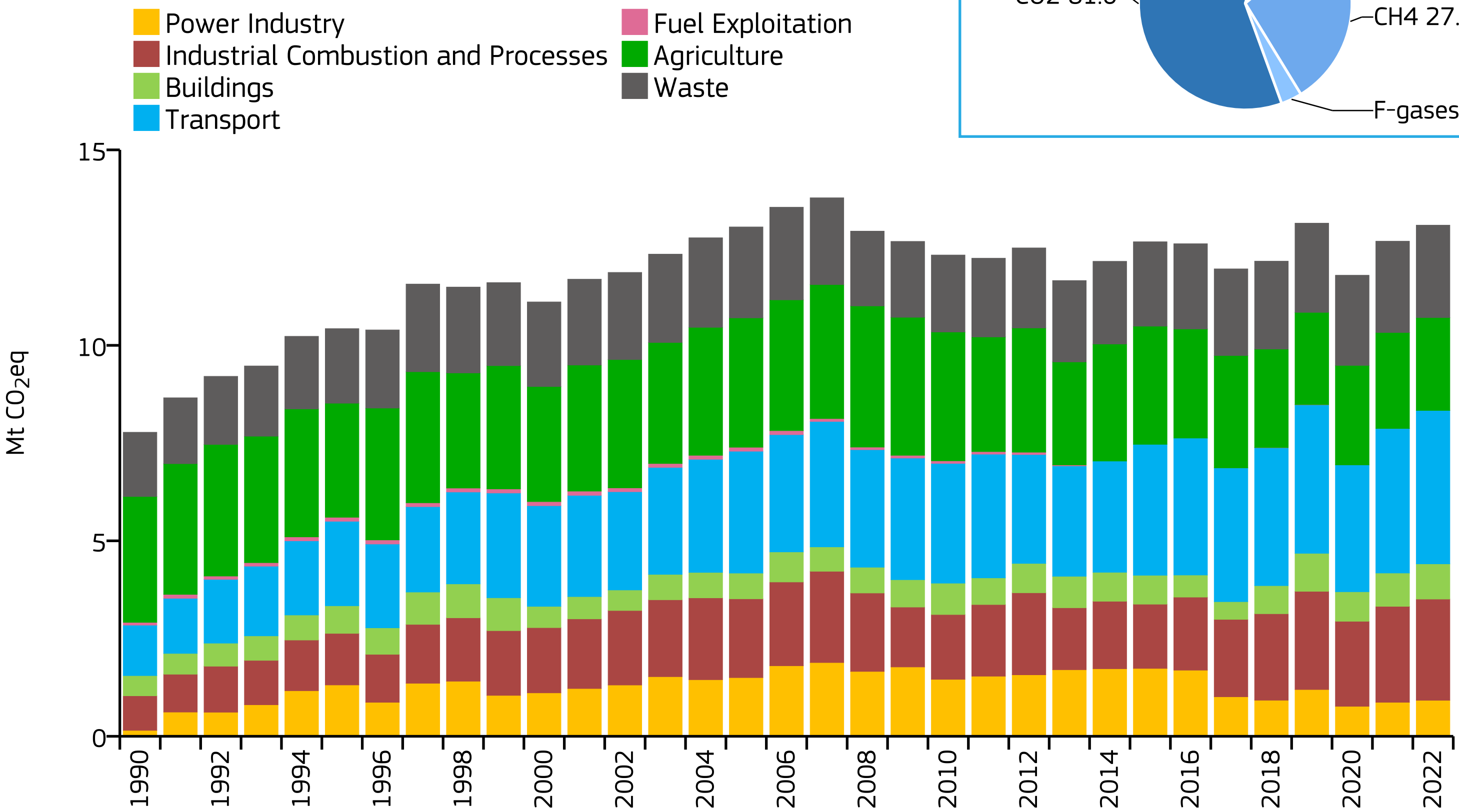
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+255%	+53%	0%
Industrial Combustion and Processes	+150%	+39%	+5%
Buildings	+132%	+27%	+13%
Transport	> +300%	+113%	+19%
Fuel Exploitation	+110%	+14%	-2%
Agriculture	+1%	-35%	0%
Waste	+93%	+43%	+2%
All sectors	+147%	+35%	+5%

El Salvador

GHG % in 2022



GHG emissions by sector

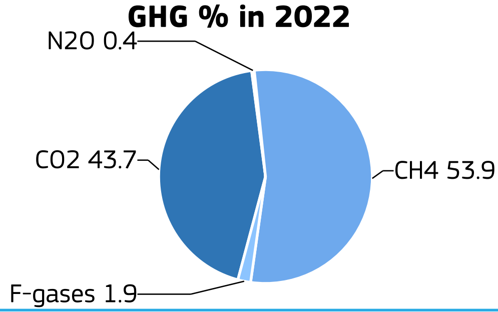


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	13.074	1.997	0.220	6.546M
2015	12.649	2.004	0.246	6.312M
2005	13.029	2.161	0.312	6.029M
1990	7.777	1.480	0.279	5.255M

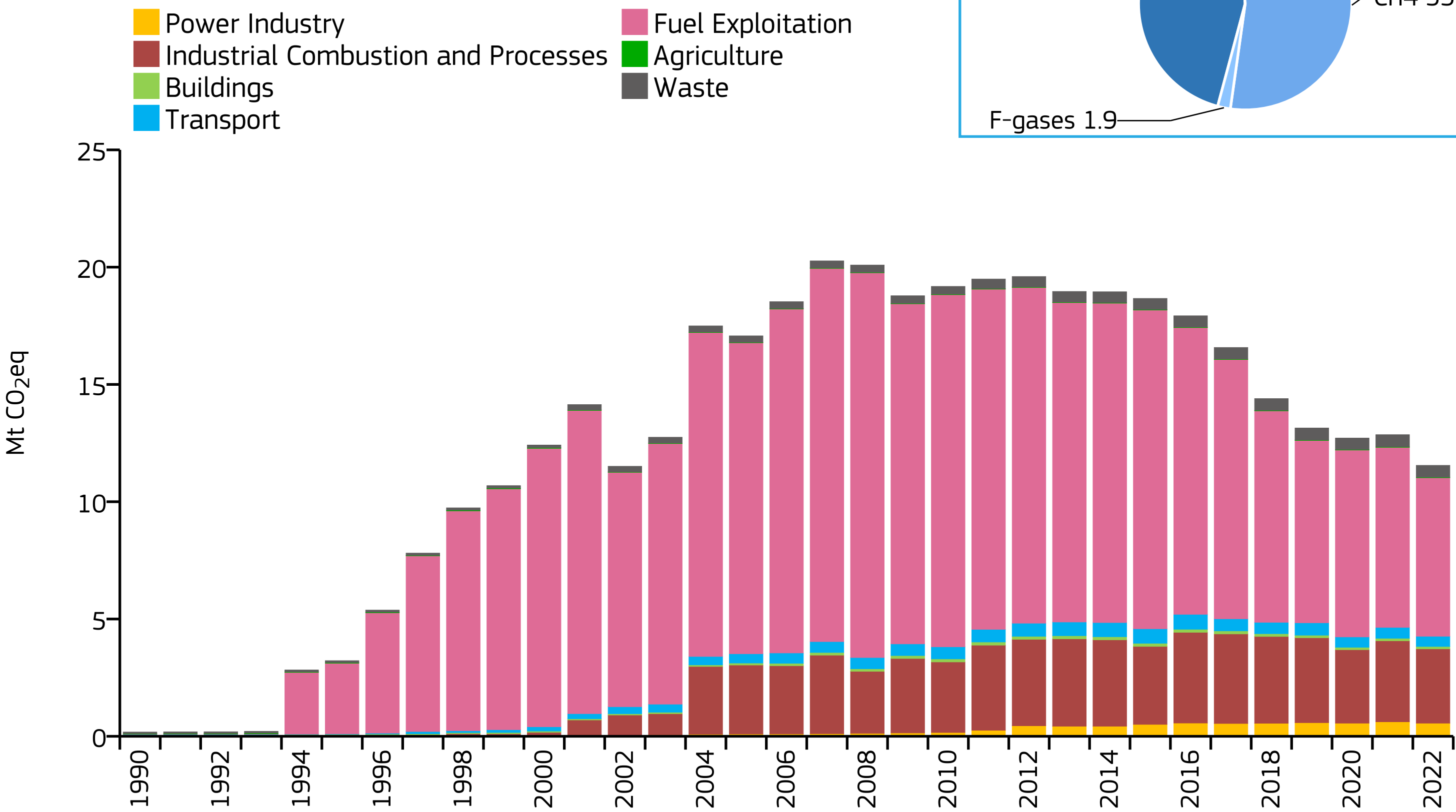
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	-39%	+6%
Industrial Combustion and Processes	+193%	+28%	+5%
Buildings	+74%	+37%	+6%
Transport	+204%	+26%	+6%
Fuel Exploitation	-99%	-99%	0%
Agriculture	-26%	-28%	-3%
Waste	+44%	+2%	+1%
All sectors	+68%	0%	+3%

Equatorial Guinea

GHG % in 2022



GHG emissions by sector

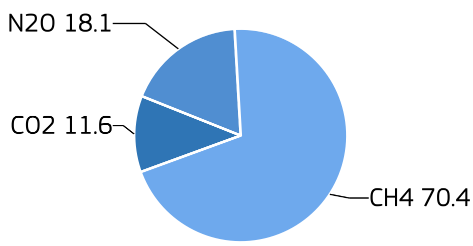


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	11.552	7.712	0.468	1.498M
2015	18.668	15.883	0.564	1.175M
2005	17.073	22.544	0.703	757.317k
1990	0.182	0.427	0.418	426.846k

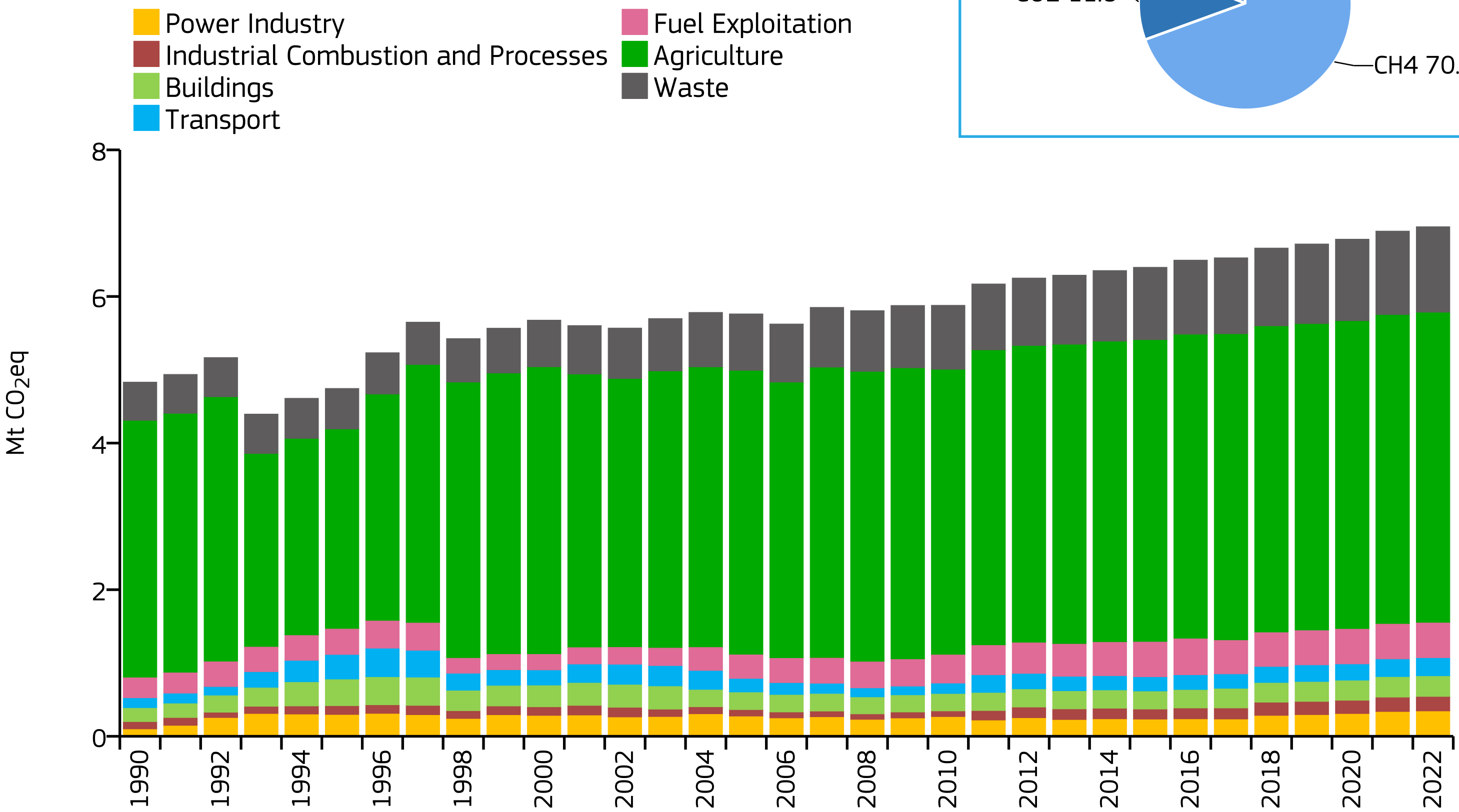
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-9%
Industrial Combustion and Processes	> +300%	+8%	-8%
Buildings	+239%	+19%	-6%
Transport	> +300%	+10%	-5%
Fuel Exploitation	> +300%	-49%	-12%
Agriculture	+16%	+14%	0%
Waste	> +300%	+83%	-2%
All sectors	> +300%	-32%	-10%

Eritrea

GHG % in 2022



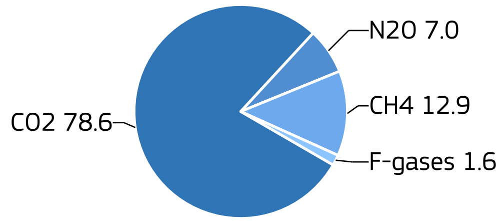
GHG emissions by sector



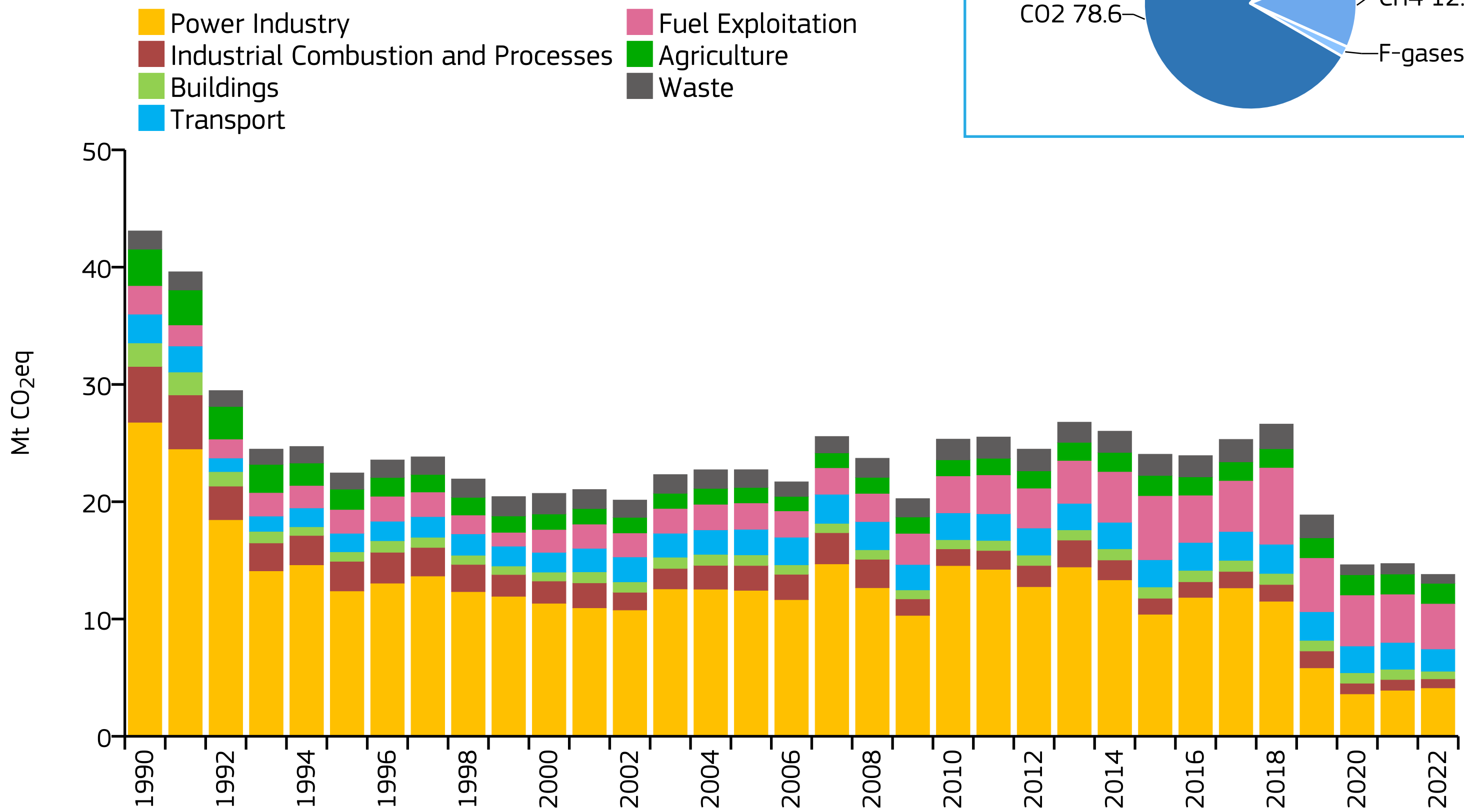
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	6.952	1.224	0.437	5.679M
2015	6.399	1.320	0.556	4.847M
2005	5.763	1.452	0.740	3.969M
1990	4.832	1.552	1.242	3.113M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+246%	+25%	+2%
Industrial Combustion and Processes	+98%	+124%	+1%
Buildings	+48%	+17%	+1%
Transport	+83%	+34%	+2%
Fuel Exploitation	+72%	+46%	0%
Agriculture	+21%	+9%	0%
Waste	+123%	+51%	+2%
All sectors	+44%	+21%	+1%

Estonia



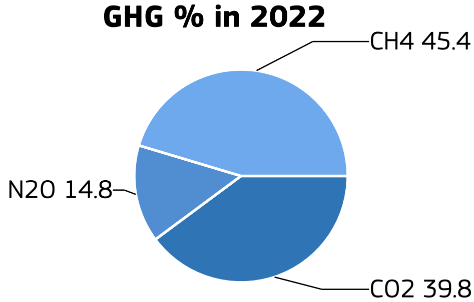
GHG emissions by sector



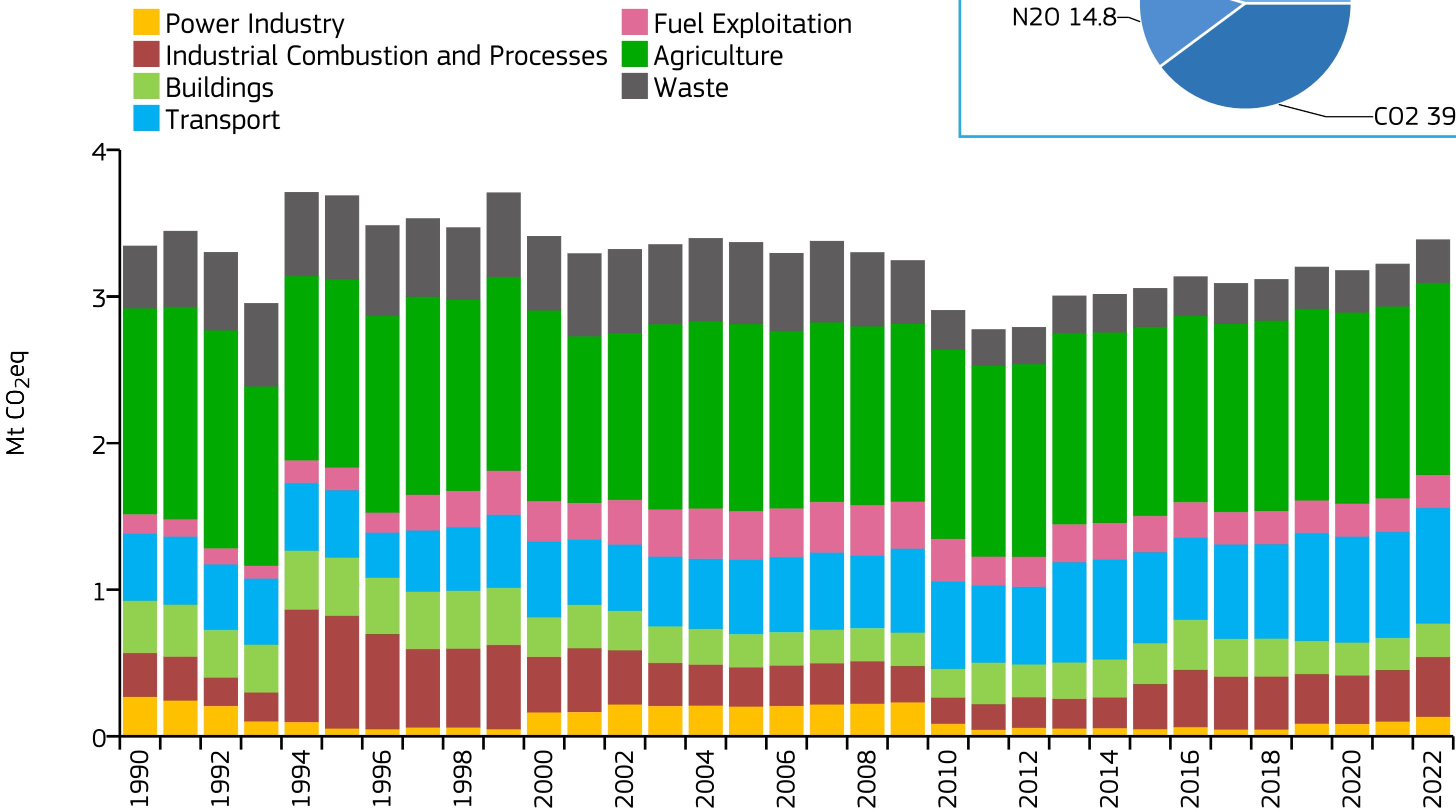
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	13.809	10.680	0.271	1.293M
2015	24.051	18.285	0.589	1.315M
2005	22.734	16.769	0.643	1.356M
1990	43.093	27.531	1.634	1.565M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-85%	-67%	+5%
Industrial Combustion and Processes	-84%	-64%	-16%
Buildings	-67%	-28%	-26%
Transport	-23%	-13%	-17%
Fuel Exploitation	+59%	+73%	-6%
Agriculture	-45%	+31%	+1%
Waste	-51%	-49%	-14%
All sectors	-68%	-39%	-6%

Eswatini



GHG emissions by sector

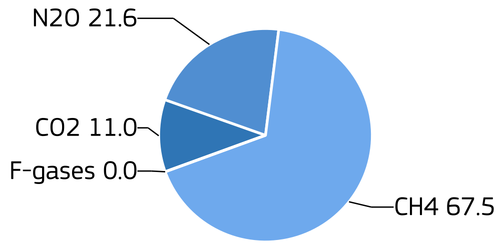


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3.387	2.279	0.309	1.486M
2015	3.056	2.317	0.333	1.319M
2005	3.369	3.047	0.499	1.106M
1990	3.345	3.883	0.798	861.373k

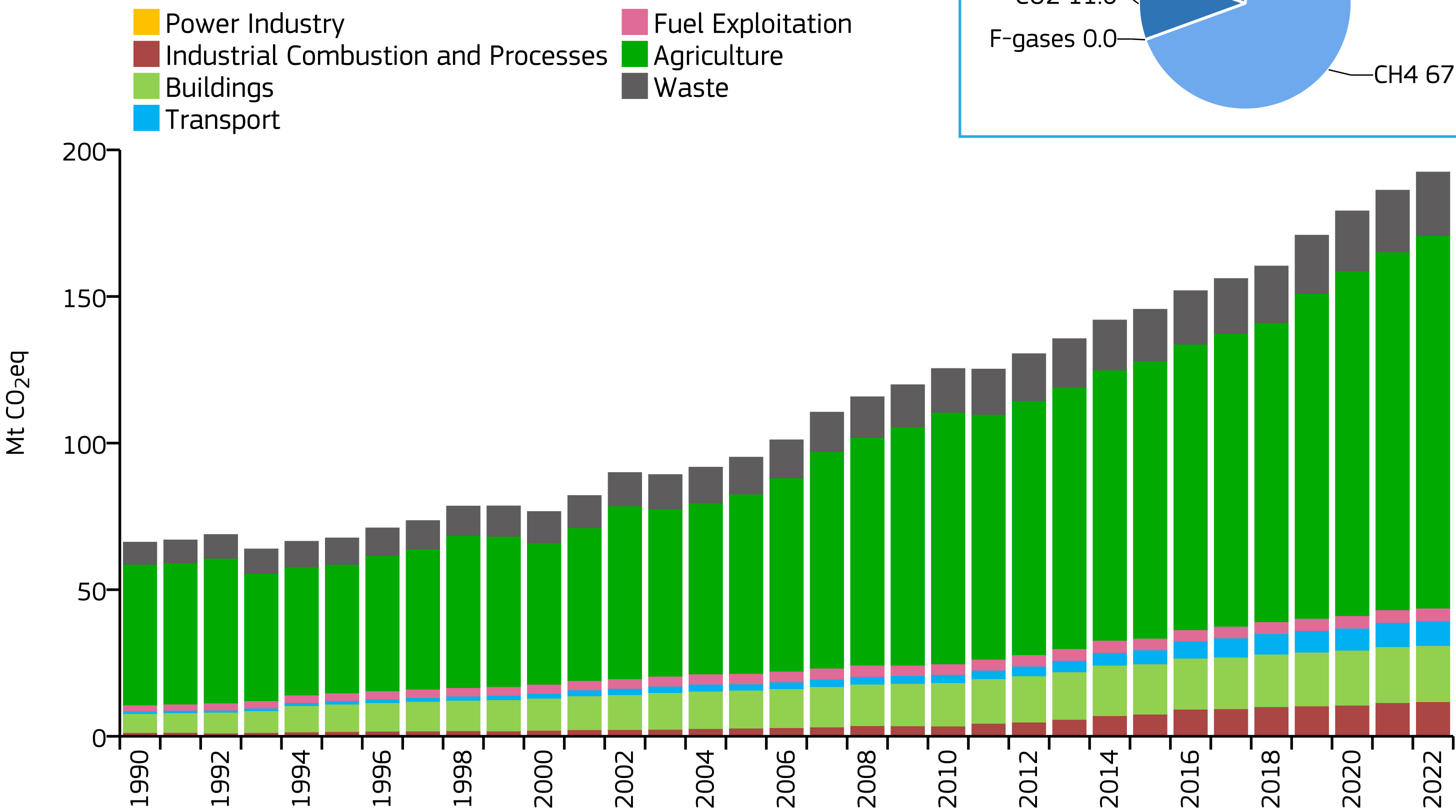
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-50%	-34%	+32%
Industrial Combustion and Processes	+36%	+52%	+16%
Buildings	-36%	+1%	+5%
Transport	+72%	+56%	+9%
Fuel Exploitation	+68%	-32%	-2%
Agriculture	-7%	+3%	0%
Waste	-31%	-47%	+1%
All sectors	+1%	+1%	+5%

Ethiopia

GHG % in 2022



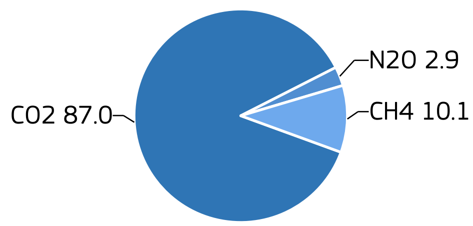
GHG emissions by sector



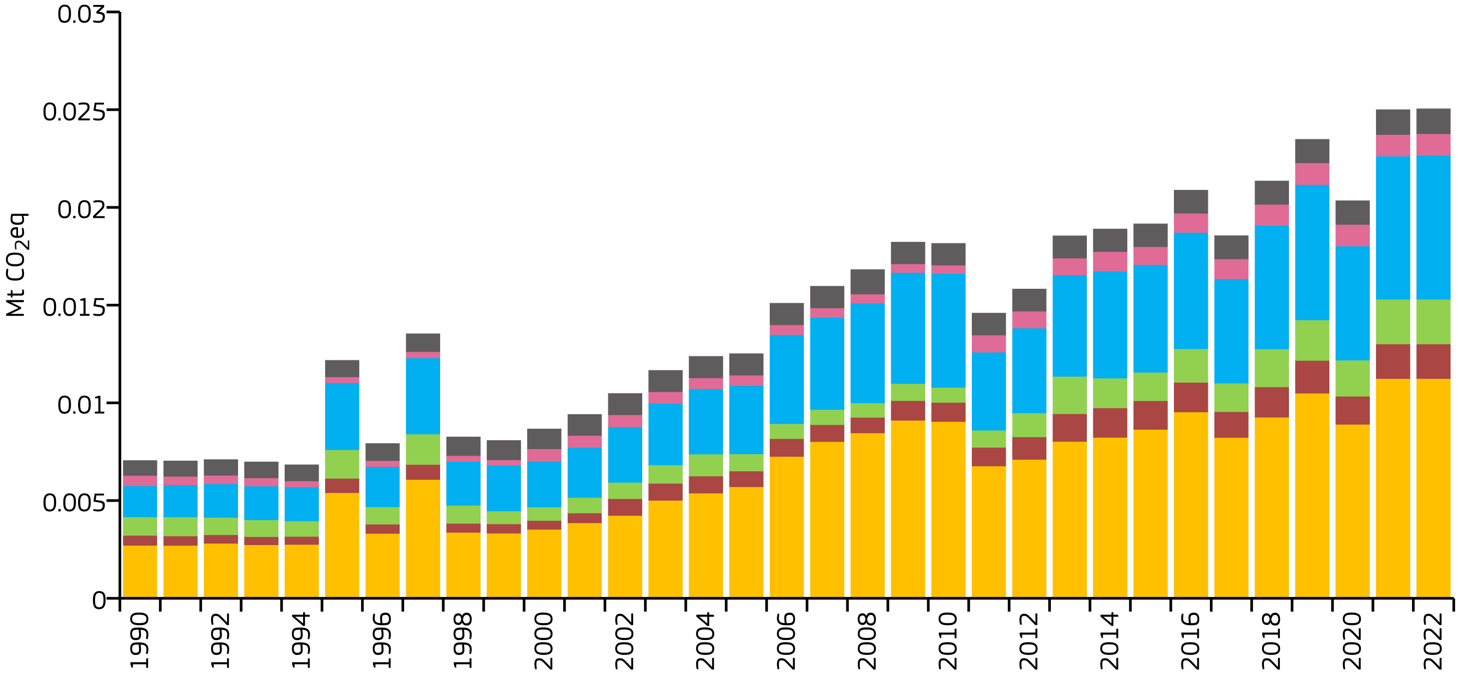
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	192.474	1.630	0.655	118.065M
2015	145.655	1.458	0.812	99.873M
2005	95.212	1.241	1.446	76.727M
1990	66.228	1.377	1.803	48.087M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-92%	-49%	+2%
Industrial Combustion and Processes	> +300%	> +300%	+3%
Buildings	+196%	+49%	0%
Transport	> +300%	+291%	+2%
Fuel Exploitation	+105%	+21%	0%
Agriculture	+165%	+108%	+4%
Waste	+184%	+72%	+3%
All sectors	+191%	+102%	+3%

Falkland Islands



GHG emissions by sector

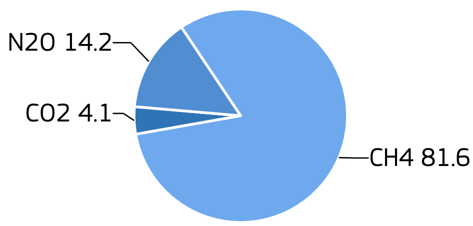


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.025	8.348	n/a	3.000k
2015	0.019	6.611	n/a	2.898k
2005	0.013	4.258	n/a	2.939k
1990	0.007	3.544	n/a	1.989k

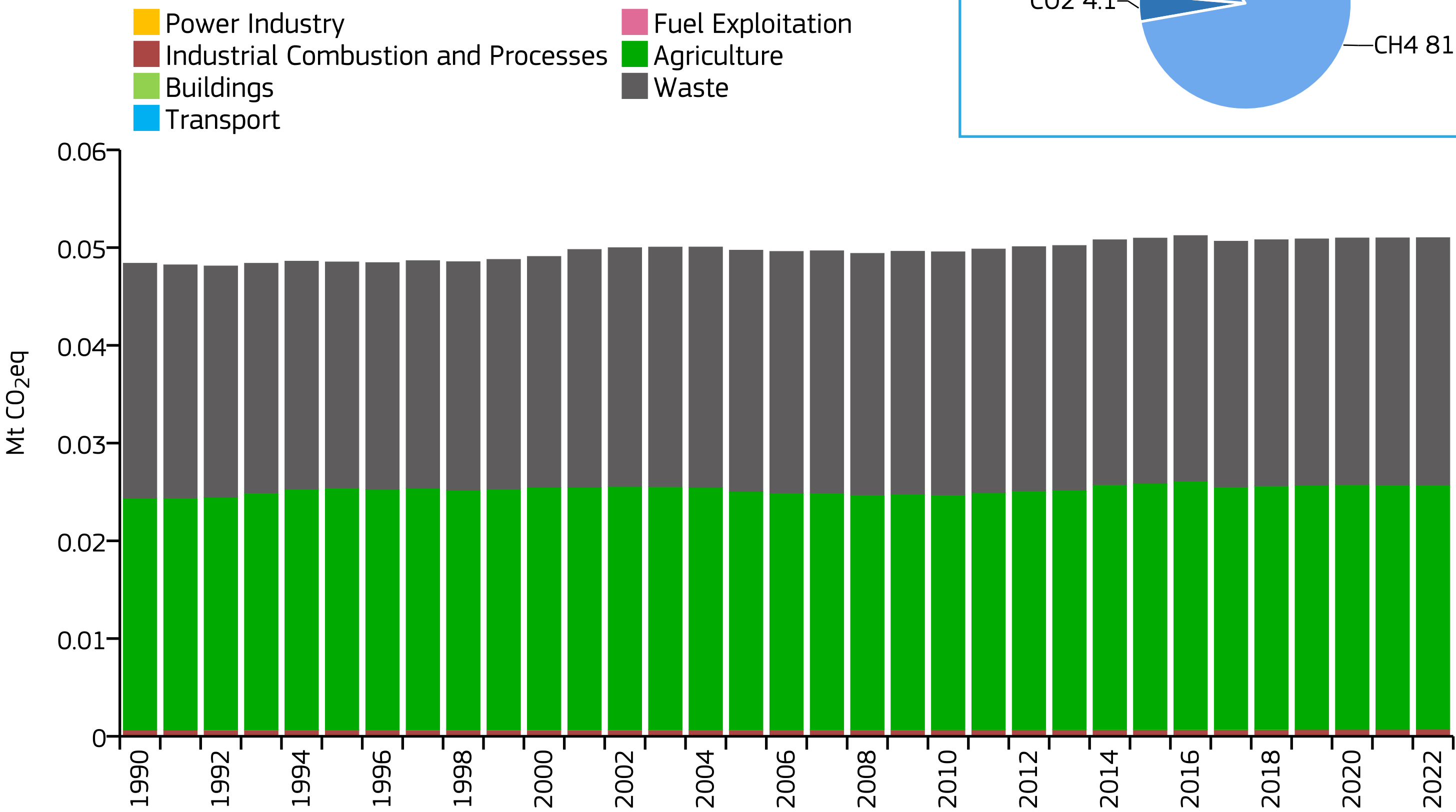
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+97%	0%
Industrial Combustion and Processes	+248%	+121%	0%
Buildings	+142%	+160%	0%
Transport	> +300%	+111%	+1%
Fuel Exploitation	+107%	+107%	0%
Agriculture	n/a	n/a	n/a
Waste	+67%	+16%	+1%
All sectors	+255%	+100%	0%

Faroes

GHG % in 2022



GHG emissions by sector

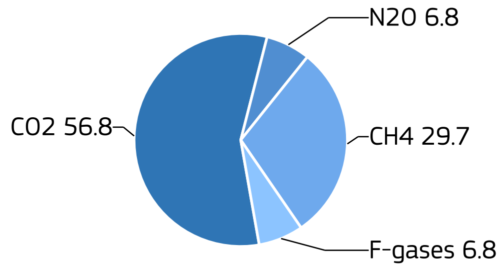


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.051	1.001	n/a	51.000k
2015	0.051	1.041	n/a	48.965k
2005	0.050	1.030	n/a	48.285k
1990	0.048	1.017	n/a	47.594k

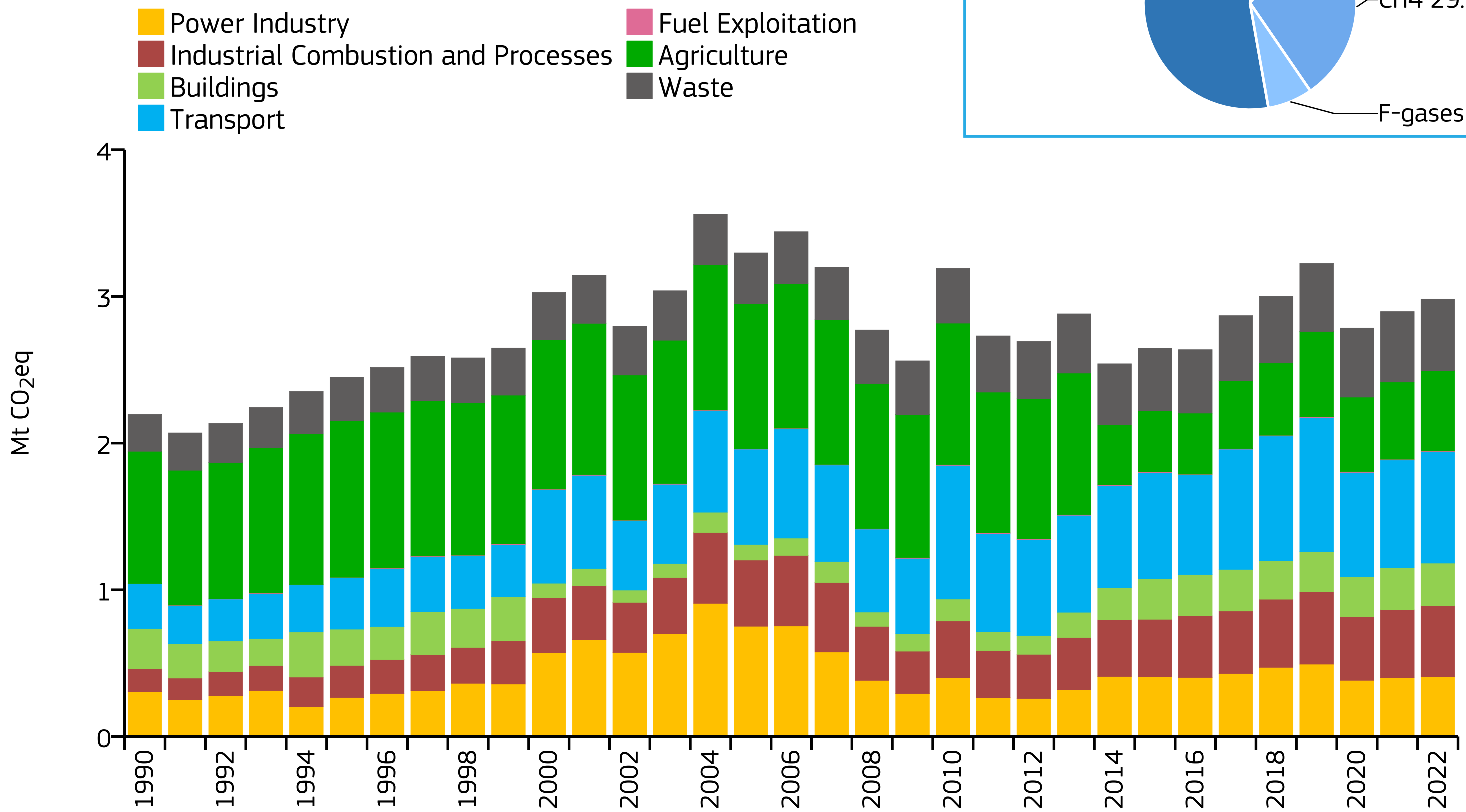
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	n/a	n/a
Industrial Combustion and Processes	+10%	+9%	+2%
Buildings	n/a	n/a	n/a
Transport	n/a	n/a	n/a
Fuel Exploitation	n/a	n/a	n/a
Agriculture	+5%	+2%	0%
Waste	+5%	+3%	0%
All sectors	+5%	+3%	0%

Fiji

GHG % in 2022



GHG emissions by sector

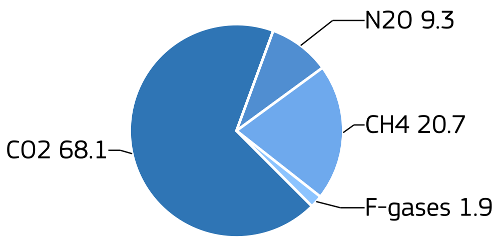


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.982	3.186	0.268	936.000k
2015	2.647	2.967	0.242	892.149k
2005	3.297	4.012	0.377	821.817k
1990	2.195	3.013	0.357	728.628k

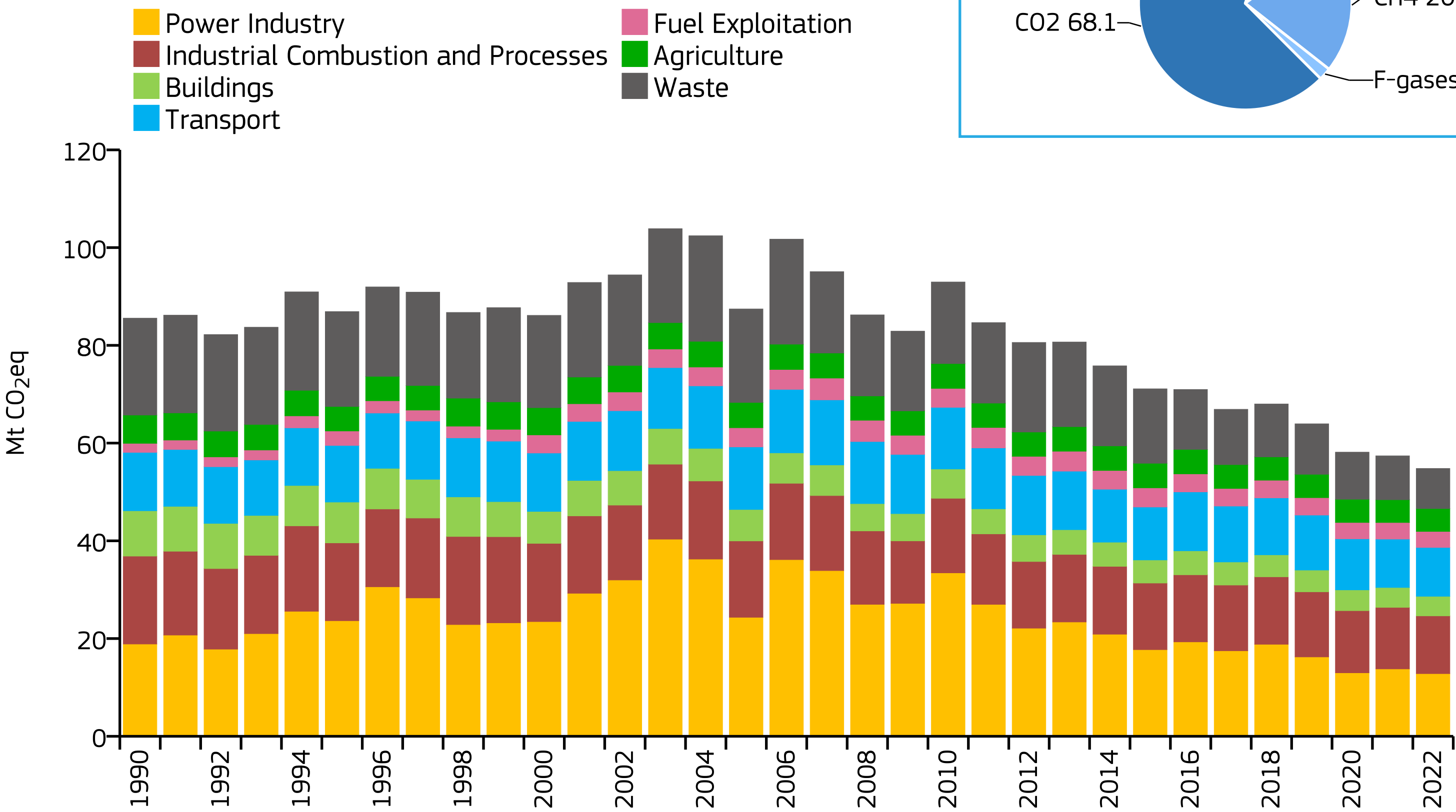
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+33%	-46%	+2%
Industrial Combustion and Processes	+209%	+7%	+5%
Buildings	+6%	+172%	+2%
Transport	+149%	+17%	+3%
Fuel Exploitation	+128%	+13%	0%
Agriculture	-39%	-44%	+4%
Waste	+95%	+40%	+2%
All sectors	+36%	-10%	+3%

Finland

GHG % in 2022



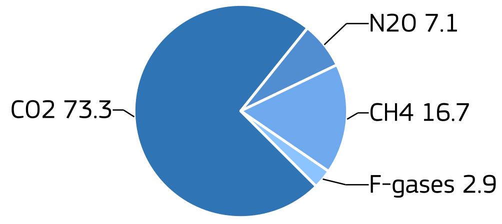
GHG emissions by sector



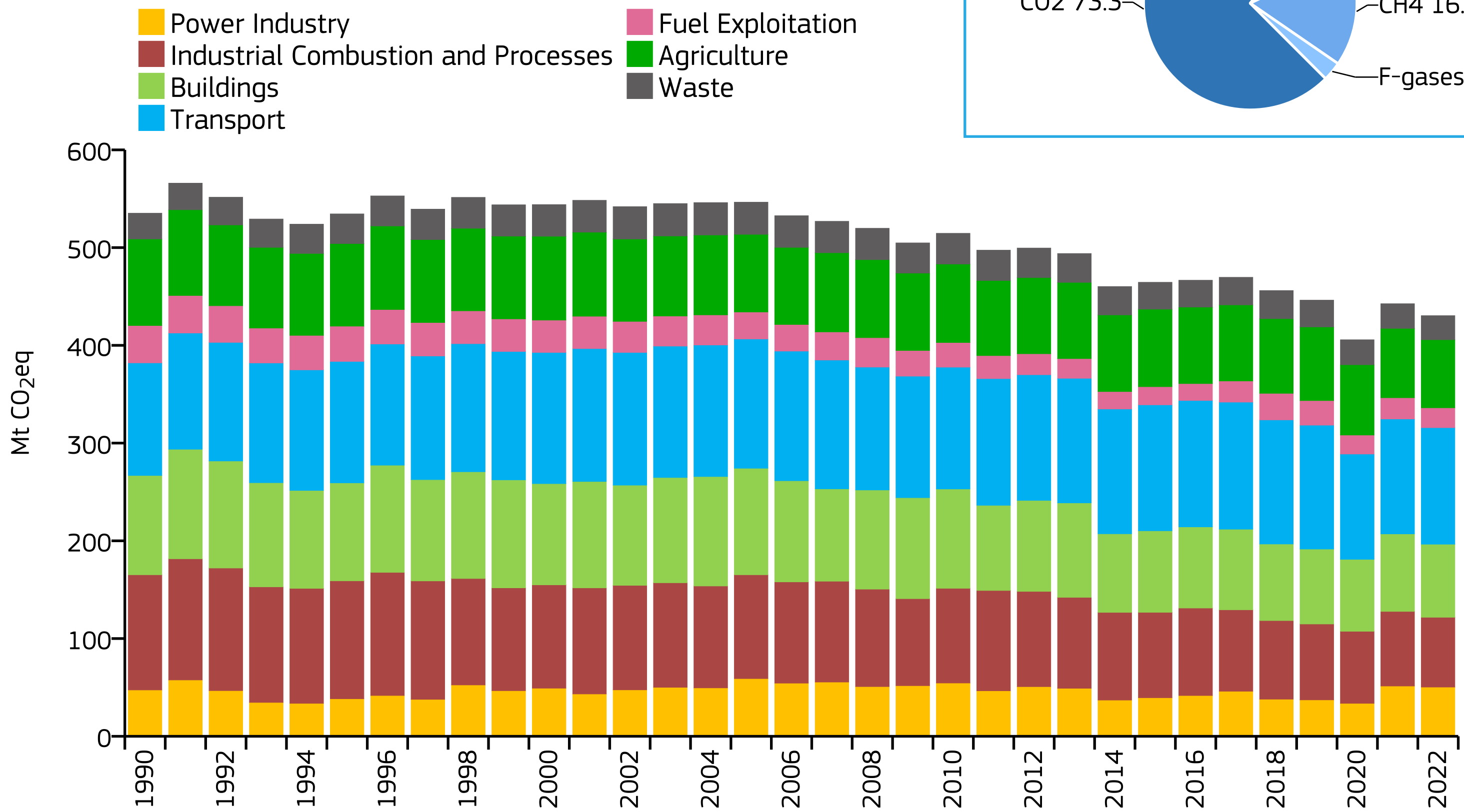
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	54.805	9.757	0.199	5.617M
2015	71.106	12.971	0.288	5.482M
2005	87.452	16.629	0.372	5.259M
1990	85.558	17.125	0.521	4.996M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-32%	-47%	-7%
Industrial Combustion and Processes	-34%	-24%	-6%
Buildings	-57%	-38%	-1%
Transport	-17%	-22%	+1%
Fuel Exploitation	+78%	-16%	-3%
Agriculture	-19%	-10%	0%
Waste	-59%	-57%	-9%
All sectors	-36%	-37%	-5%

France and Monaco



GHG emissions by sector

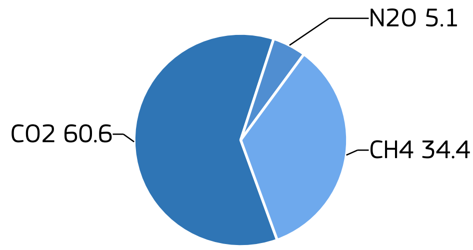


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	430.363	6.503	0.138	66.183M
2015	464.525	7.207	0.161	64.457M
2005	546.470	8.924	0.208	61.234M
1990	535.187	9.396	0.272	56.961M

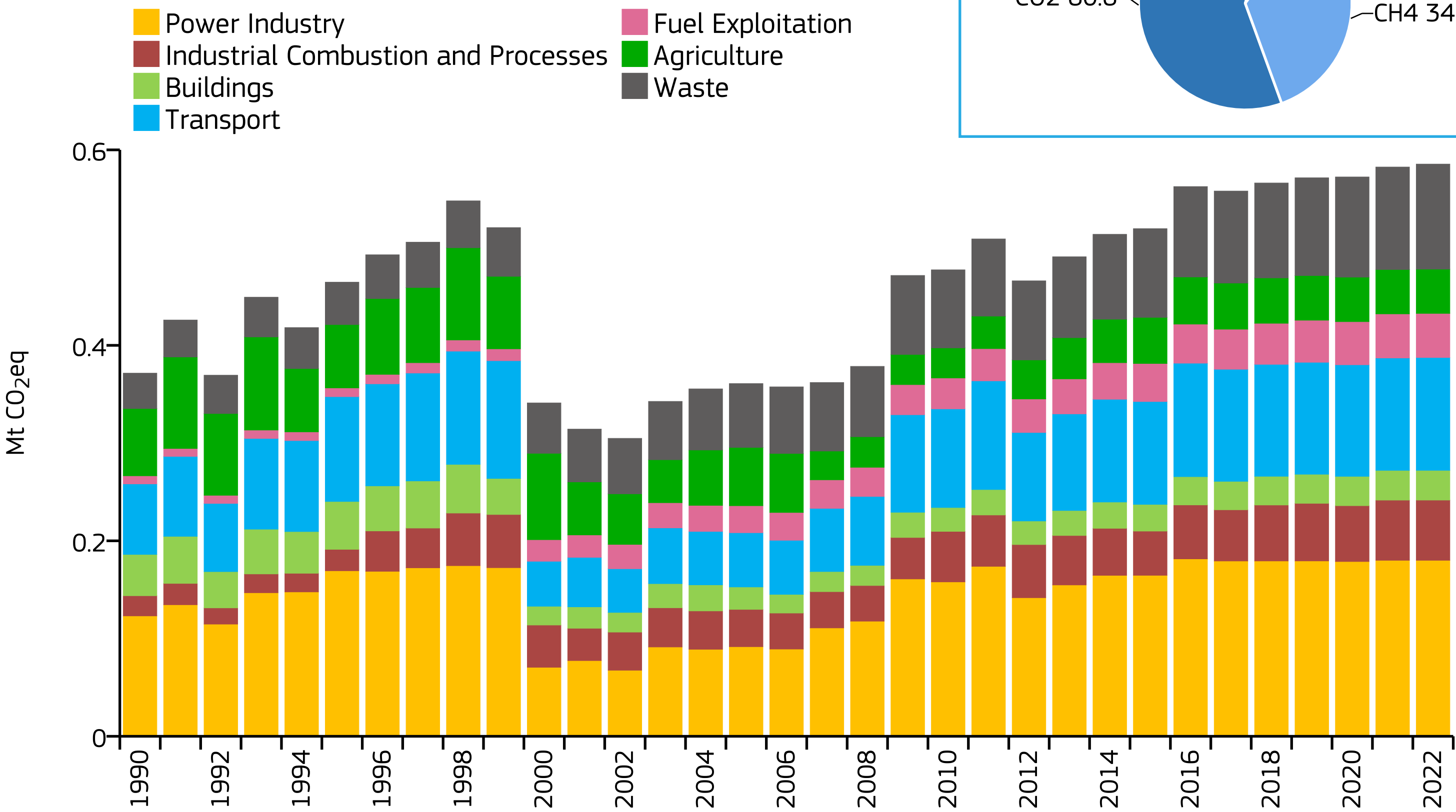
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+6%	-15%	-2%
Industrial Combustion and Processes	-39%	-33%	-6%
Buildings	-26%	-31%	-6%
Transport	+3%	-10%	+1%
Fuel Exploitation	-47%	-26%	-6%
Agriculture	-21%	-12%	-2%
Waste	-7%	-25%	-2%
All sectors	-20%	-21%	-3%

French Guiana

GHG % in 2022



GHG emissions by sector

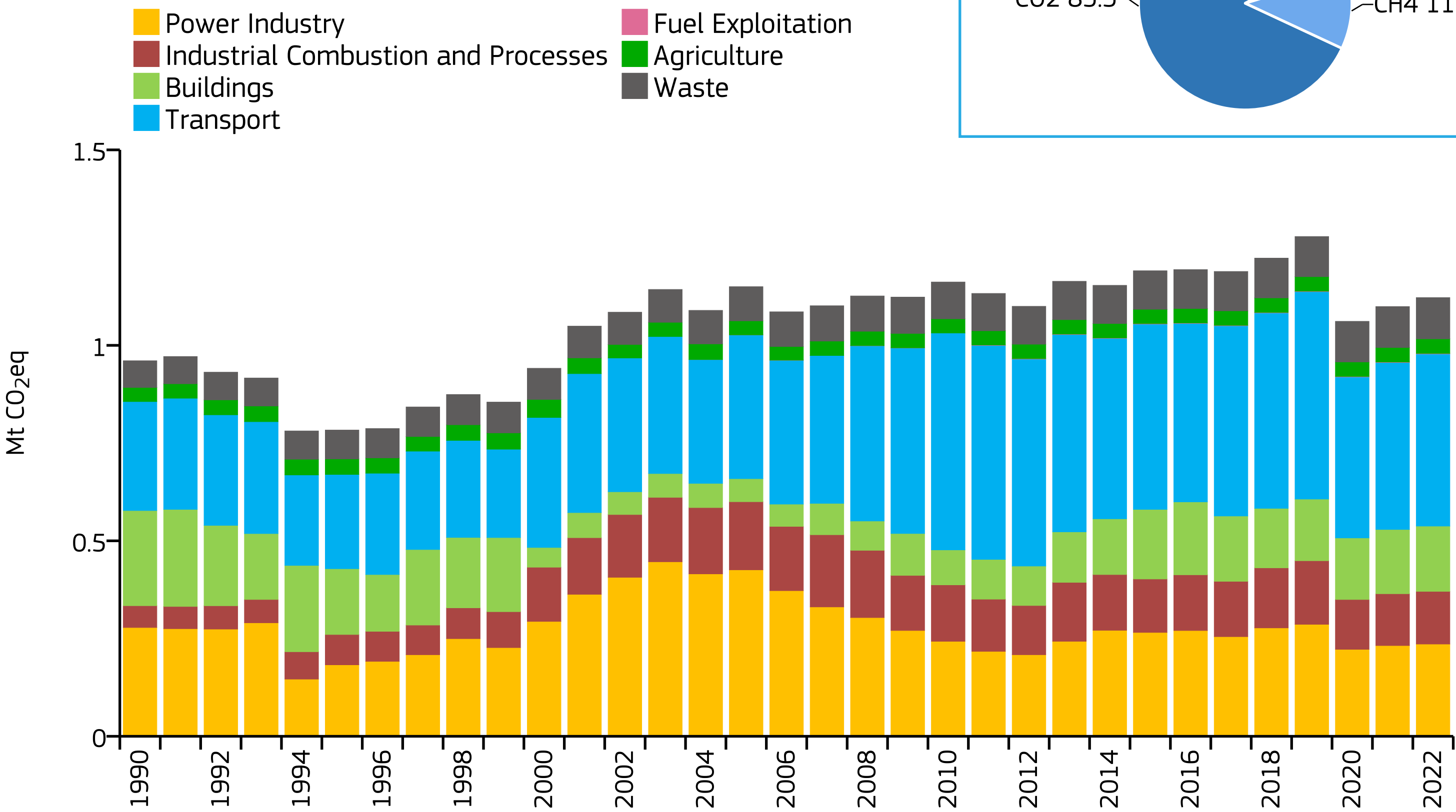


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.585	1.835	n/a	319.000k
2015	0.519	1.933	n/a	268.691k
2005	0.361	1.771	n/a	203.826k
1990	0.372	3.209	n/a	115.784k

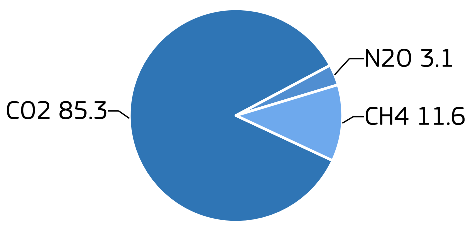
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+46%	+96%	0%
Industrial Combustion and Processes	+198%	+62%	0%
Buildings	-28%	+33%	0%
Transport	+60%	+108%	0%
Fuel Exploitation	> +300%	+63%	0%
Agriculture	-34%	-24%	0%
Waste	+197%	+65%	+3%
All sectors	+58%	+62%	+1%

French Polynesia

GHG emissions by sector



GHG % in 2022

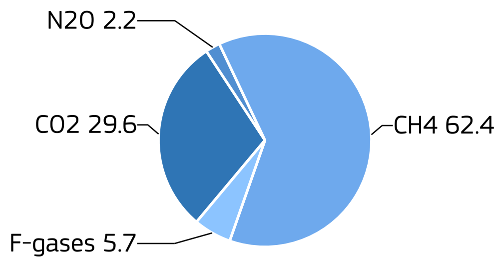


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.122	3.817	0.203	294.000k
2015	1.191	4.288	0.217	277.690k
2005	1.150	4.512	0.199	254.886k
1990	0.961	4.842	0.229	198.375k

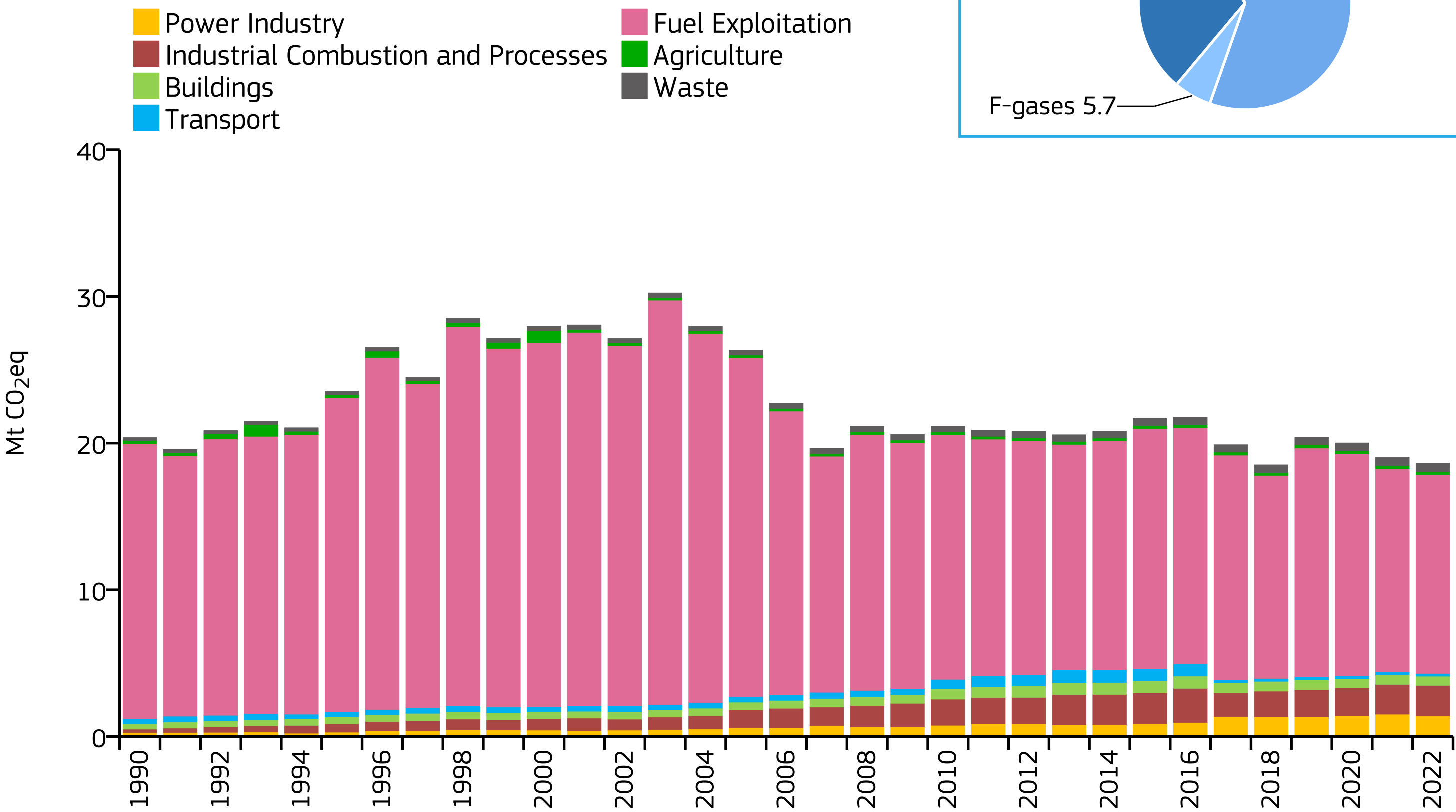
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-15%	-45%	+2%
Industrial Combustion and Processes	+141%	-23%	+2%
Buildings	-31%	+184%	+2%
Transport	+58%	+20%	+3%
Fuel Exploitation	n/a	> +300%	0%
Agriculture	+3%	+4%	0%
Waste	+54%	+21%	+1%
All sectors	+17%	-2%	+2%

Gabon

GHG % in 2022



GHG emissions by sector

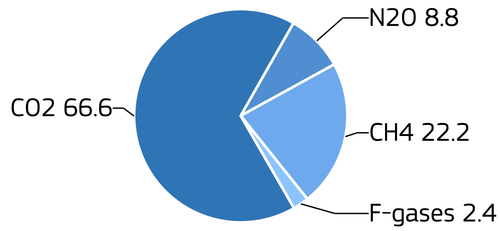


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	18.627	8.323	0.559	2.238M
2015	21.676	11.230	0.718	1.930M
2005	26.339	18.772	1.202	1.403M
1990	20.391	21.415	1.181	952.212k

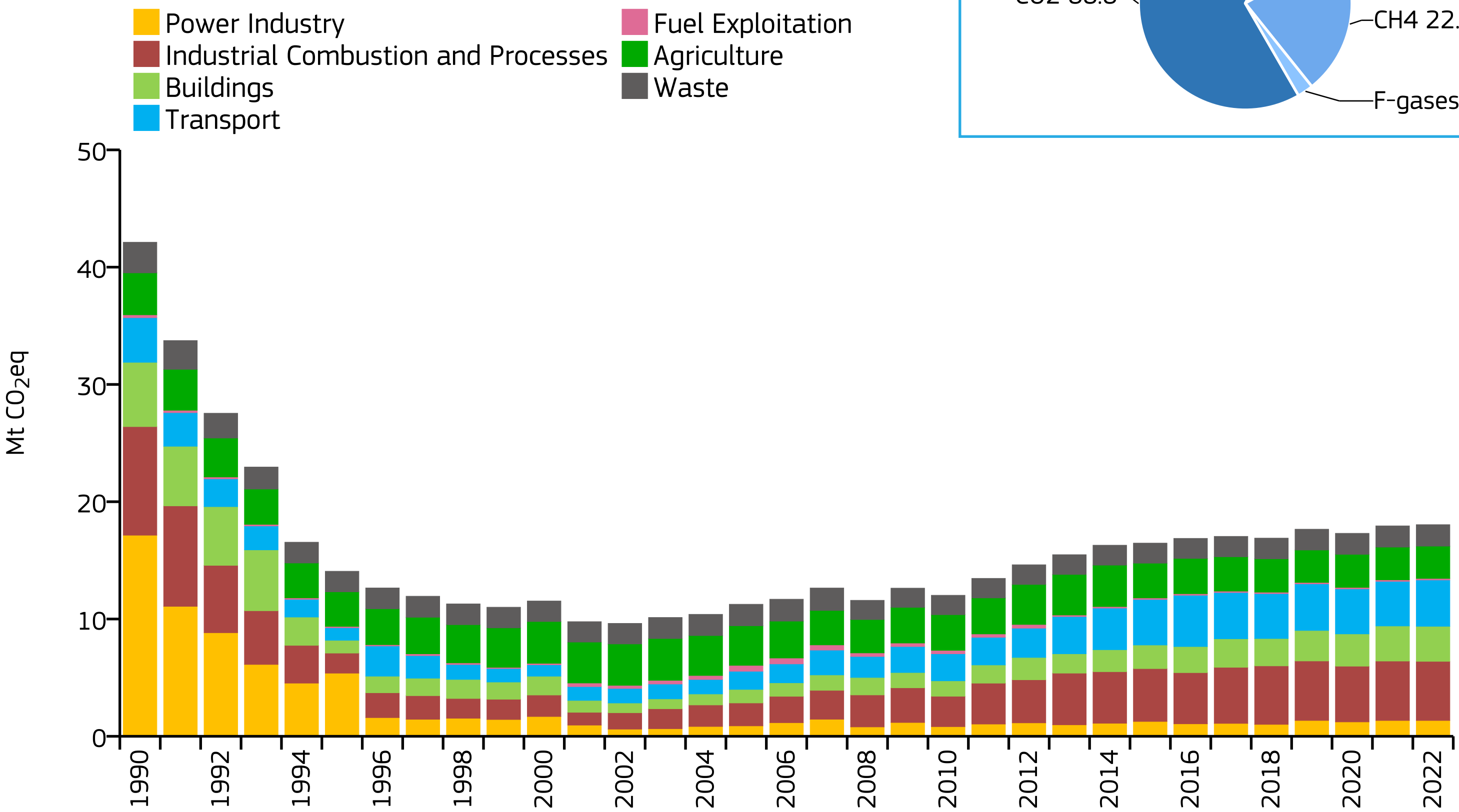
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+131%	-8%
Industrial Combustion and Processes	> +300%	+73%	+3%
Buildings	+65%	+18%	-2%
Transport	-42%	-49%	-5%
Fuel Exploitation	-28%	-41%	-2%
Agriculture	-12%	+18%	+5%
Waste	+169%	+66%	+2%
All sectors	-9%	-29%	-2%

Georgia

GHG % in 2022



GHG emissions by sector

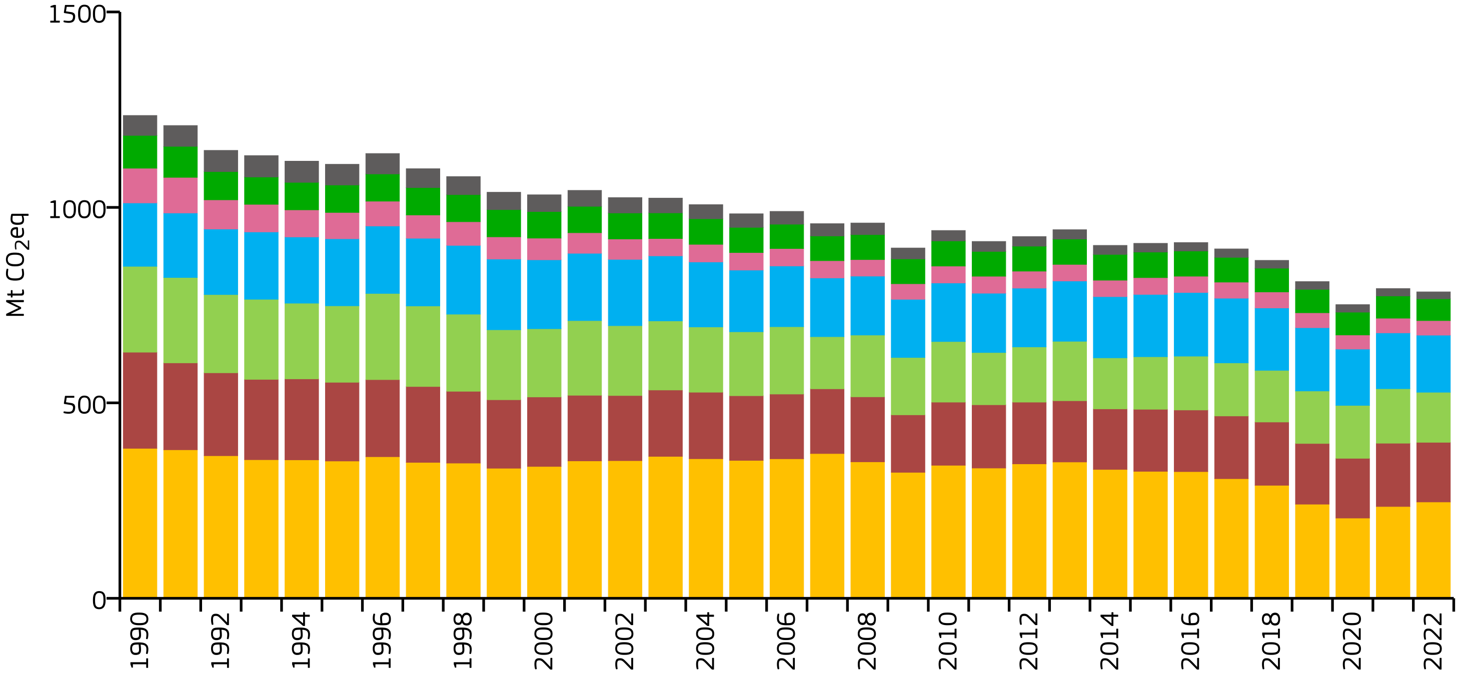


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	18.046	4.656	0.285	3.876M
2015	16.472	4.169	0.351	3.952M
2005	11.260	2.510	0.394	4.487M
1990	42.124	7.786	0.788	5.410M

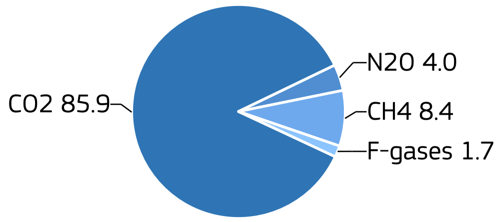
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-92%	+52%	0%
Industrial Combustion and Processes	-46%	+158%	-1%
Buildings	-45%	+159%	0%
Transport	+4%	+155%	+4%
Fuel Exploitation	-47%	-74%	+1%
Agriculture	-23%	-18%	-1%
Waste	-30%	0%	+1%
All sectors	-57%	+60%	+1%

Germany

GHG emissions by sector



GHG % in 2022

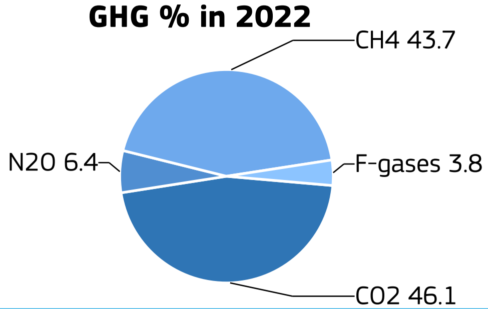


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	784.005	9.493	0.174	82.592M
2015	908.132	11.114	0.217	81.708M
2005	983.713	12.045	0.271	81.671M
1990	1235.235	15.613	0.424	79.118M

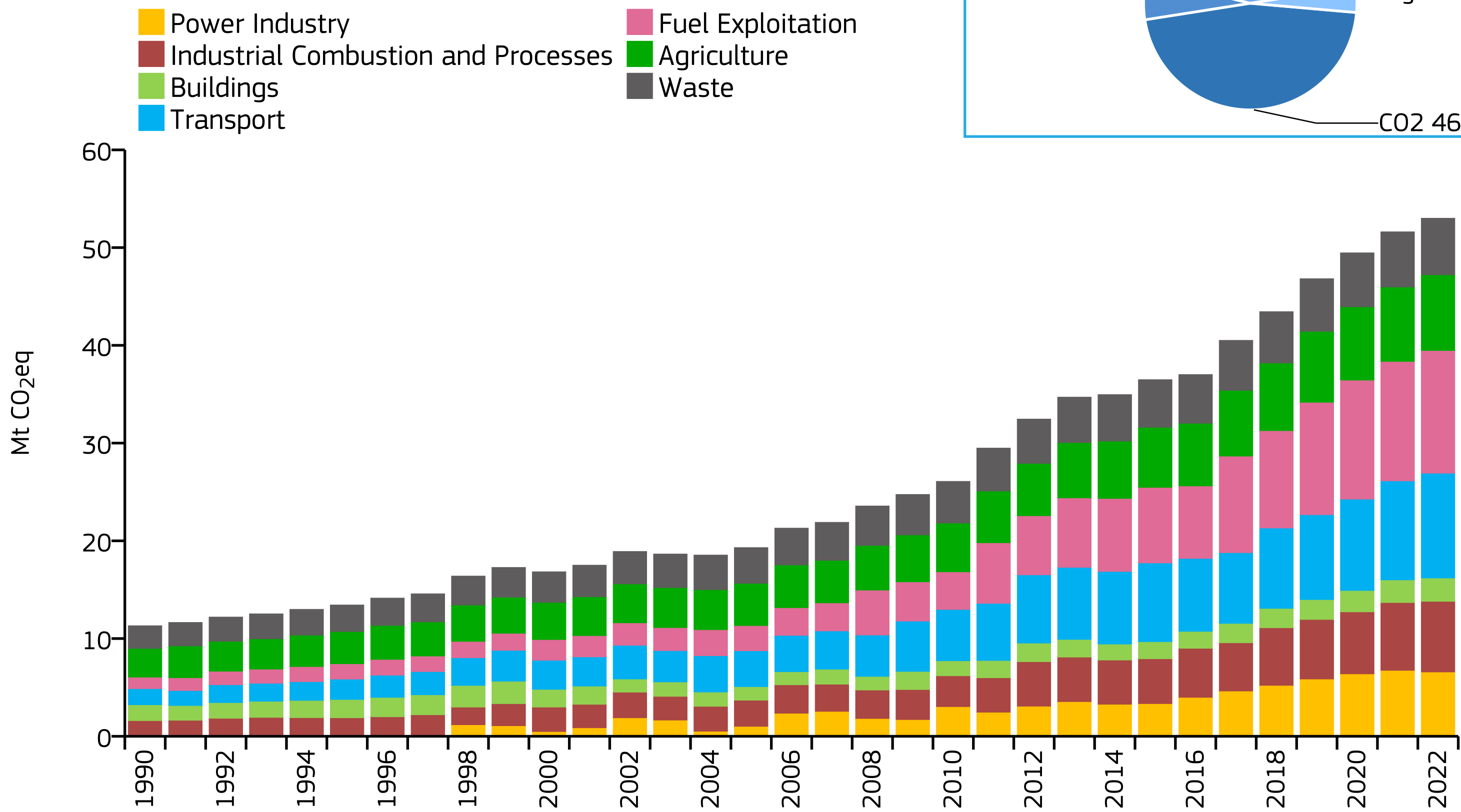
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-36%	-30%	+5%
Industrial Combustion and Processes	-38%	-8%	-6%
Buildings	-42%	-22%	-8%
Transport	-10%	-7%	+2%
Fuel Exploitation	-58%	-17%	-1%
Agriculture	-34%	-13%	-2%
Waste	-65%	-49%	-6%
All sectors	-37%	-20%	-1%

Ghana

GHG % in 2022



GHG emissions by sector

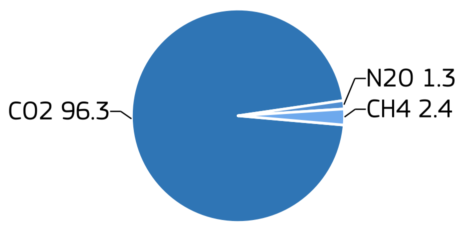


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	53.007	1.656	0.288	32.018M
2015	36.492	1.323	0.274	27.583M
2005	19.311	0.896	0.279	21.542M
1990	11.319	0.774	0.319	14.628M

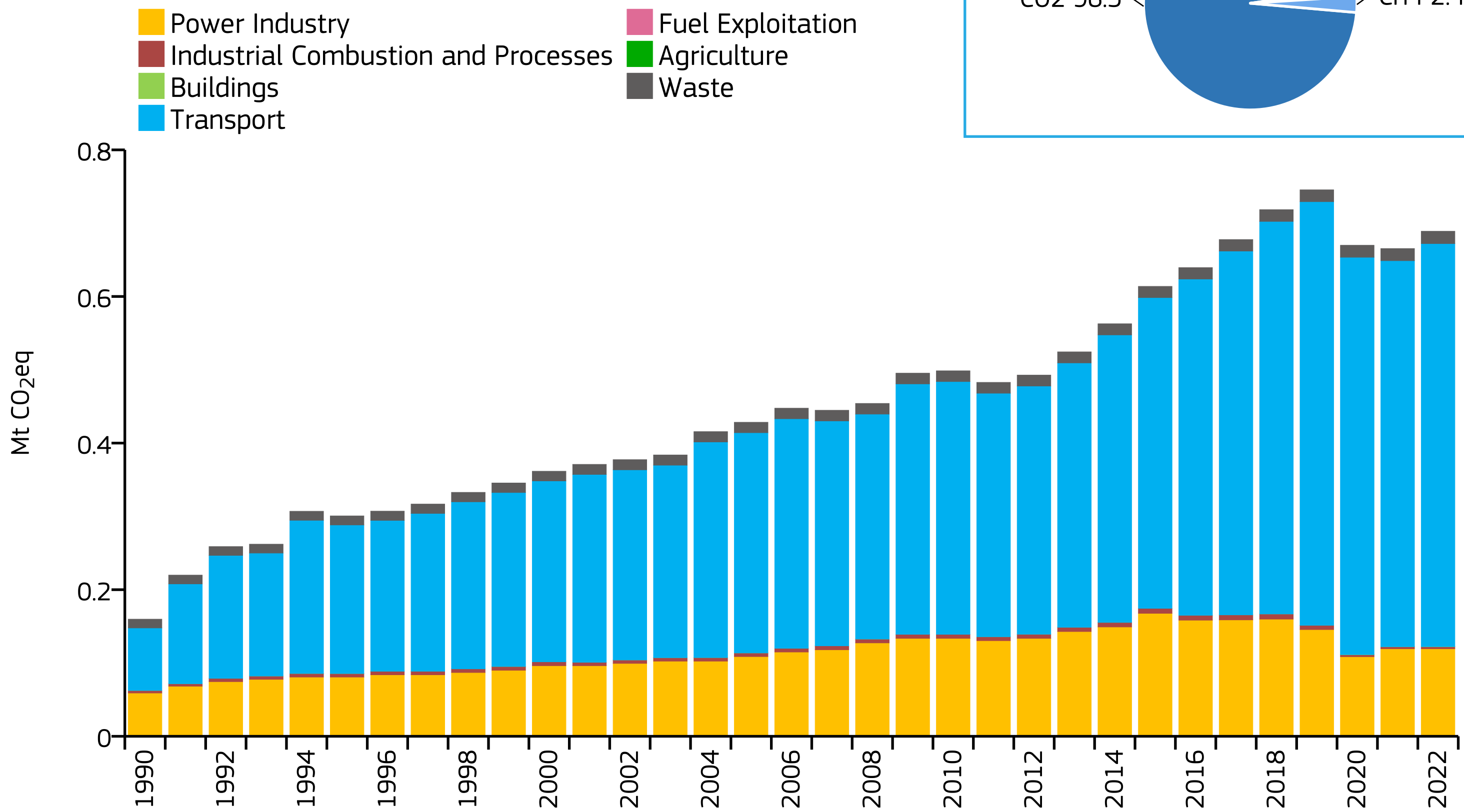
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	> +300%	-2%
Industrial Combustion and Processes	> +300%	+170%	+4%
Buildings	+47%	+72%	+3%
Transport	> +300%	+192%	+6%
Fuel Exploitation	> +300%	> +300%	+3%
Agriculture	+164%	+79%	+2%
Waste	+148%	+58%	+2%
All sectors	> +300%	+174%	+3%

Gibraltar

GHG % in 2022



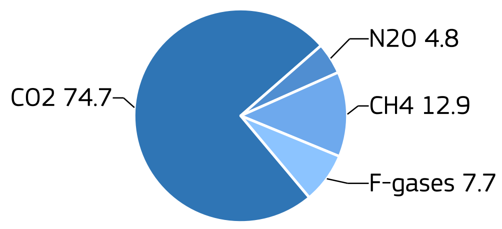
GHG emissions by sector



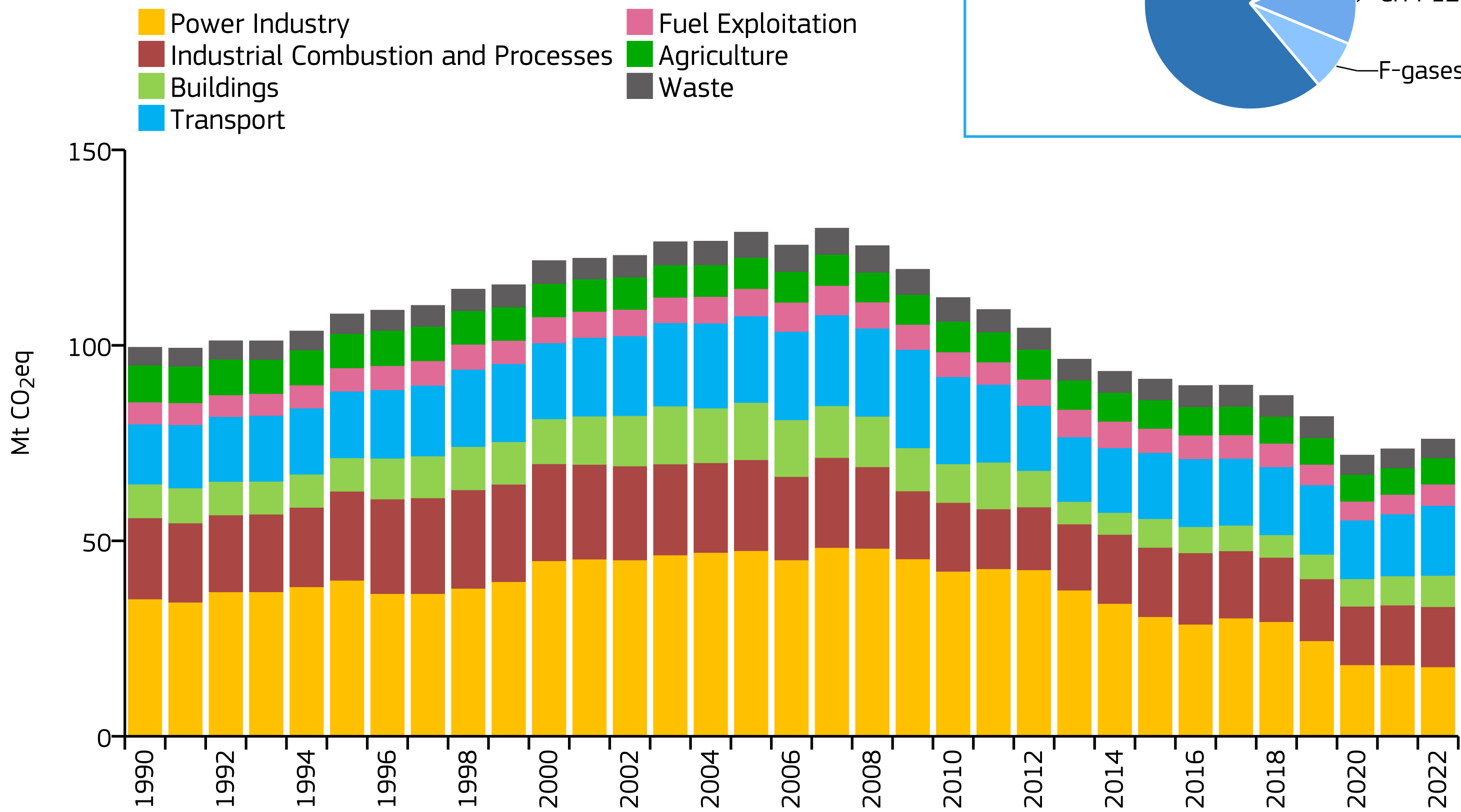
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.689	19.685	0.235	35.000k
2015	0.614	17.933	0.614	34.228k
2005	0.428	13.352	0.576	32.085k
1990	0.160	5.479	0.453	29.164k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+102%	+10%	0%
Industrial Combustion and Processes	-16%	-42%	+3%
Buildings	> +300%	> +300%	0%
Transport	> +300%	+83%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+40%	+18%	+1%
All sectors	> +300%	+61%	+4%

Greece



GHG emissions by sector

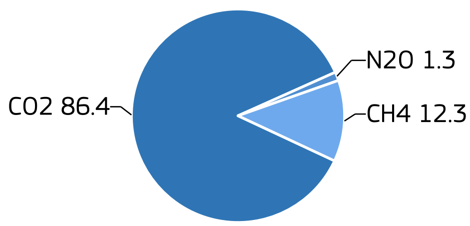


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	76.031	6.884	0.228	11.044M
2015	91.374	8.145	0.299	11.218M
2005	128.976	11.413	0.339	11.301M
1990	99.514	9.710	0.402	10.248M

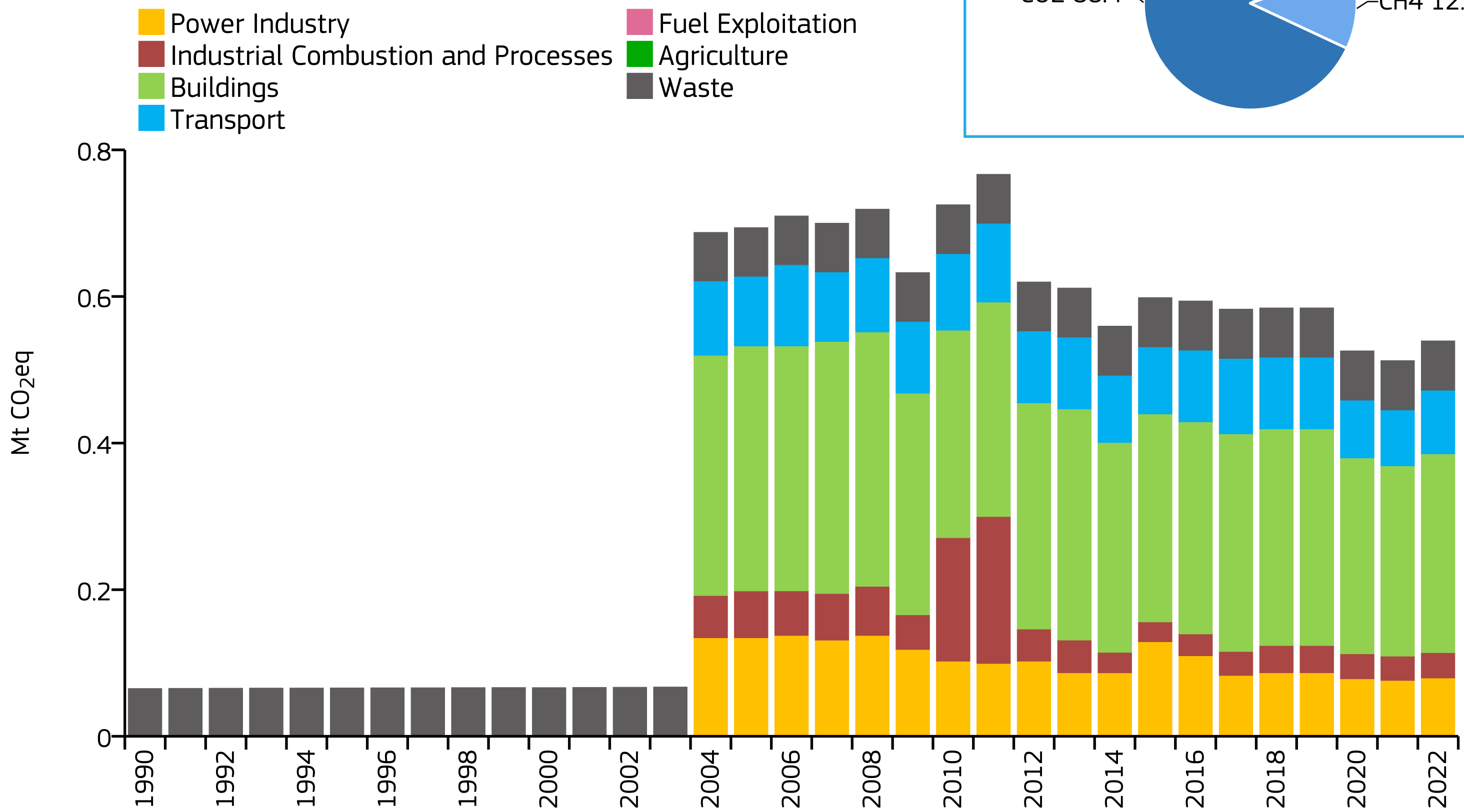
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-50%	-63%	-3%
Industrial Combustion and Processes	-26%	-34%	+1%
Buildings	-8%	-45%	+7%
Transport	+16%	-19%	+13%
Fuel Exploitation	-3%	-22%	+9%
Agriculture	-29%	-16%	-1%
Waste	+6%	-26%	-2%
All sectors	-24%	-41%	+3%

Greenland

GHG % in 2022



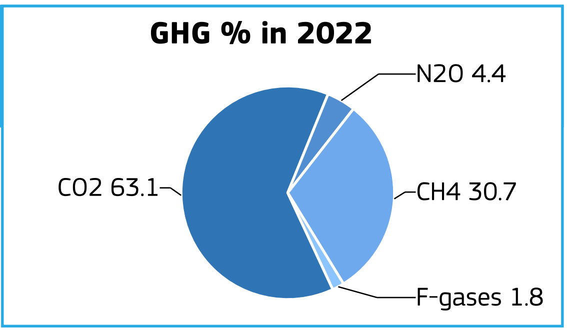
GHG emissions by sector



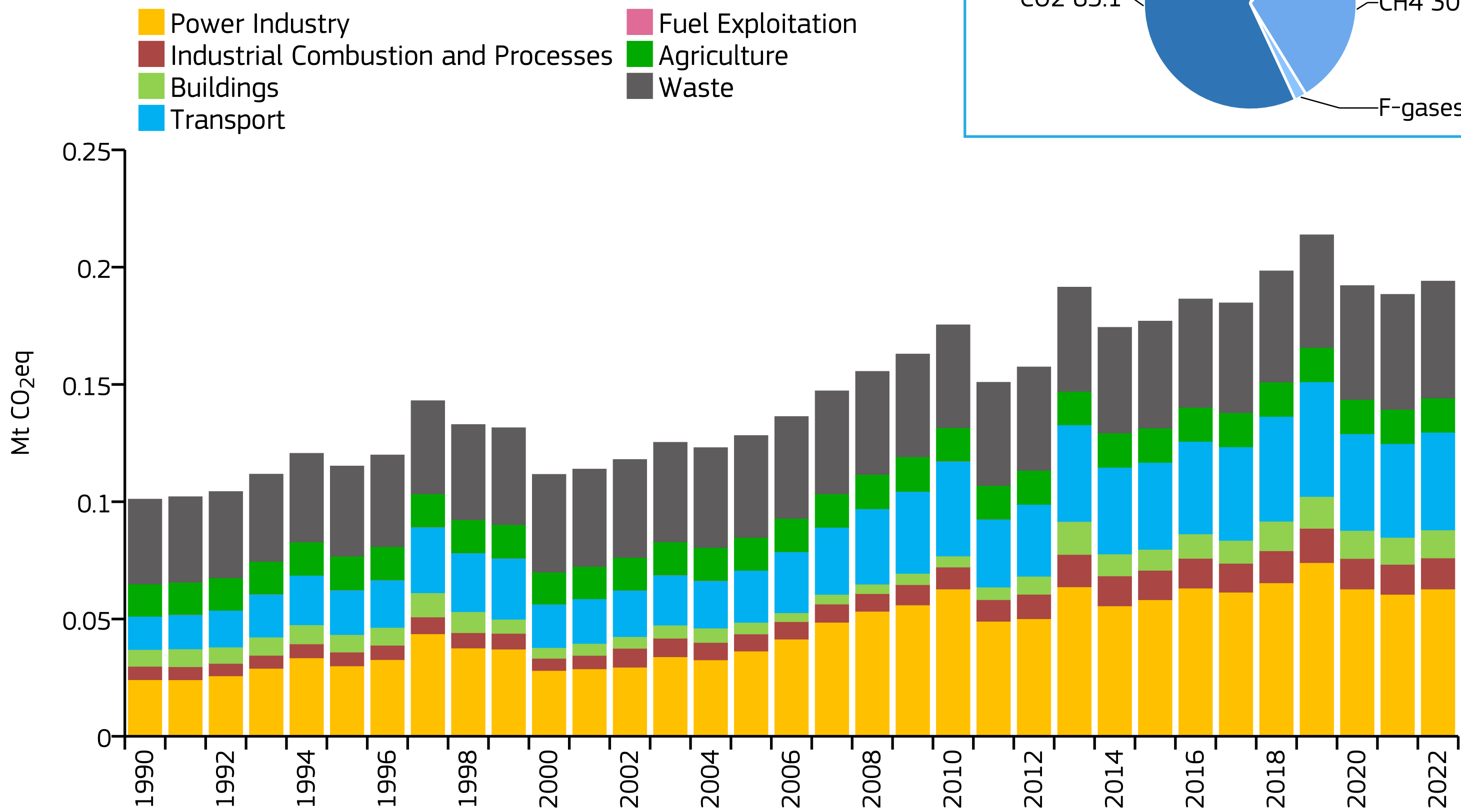
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.540	9.465	0.002	57.000k
2015	0.599	10.617	0.002	56.377k
2005	0.694	12.186	0.003	56.951k
1990	0.065	1.173	0.000	55.604k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	-41%	+4%
Industrial Combustion and Processes	n/a	-46%	+4%
Buildings	n/a	-19%	+4%
Transport	n/a	-9%	+14%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+5%	+1%	0%
All sectors	n/a	-22%	+5%

Grenada



GHG emissions by sector

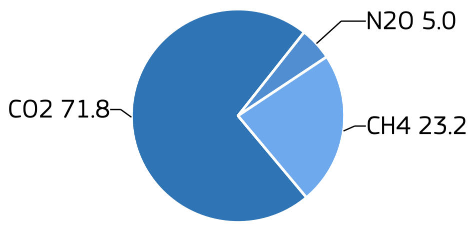


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.194	1.748	0.108	111.000k
2015	0.177	1.657	0.107	106.823k
2005	0.128	1.245	0.086	102.949k
1990	0.101	1.050	0.119	96.283k

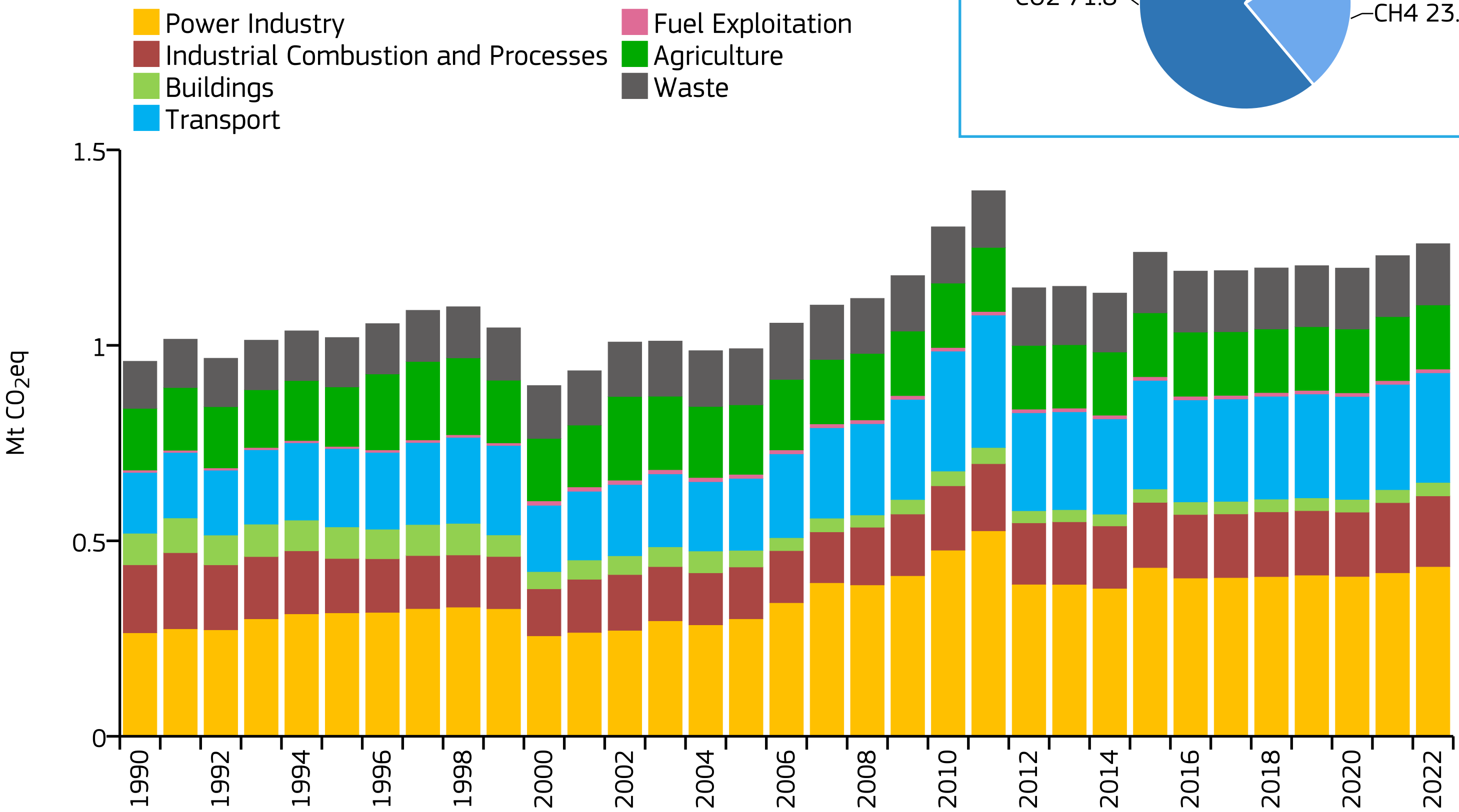
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+160%	+73%	+4%
Industrial Combustion and Processes	+132%	+82%	+3%
Buildings	+67%	+142%	+4%
Transport	+194%	+87%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	+6%	+4%	0%
Waste	+38%	+15%	+2%
All sectors	+92%	+51%	+3%

Guadeloupe

GHG % in 2022



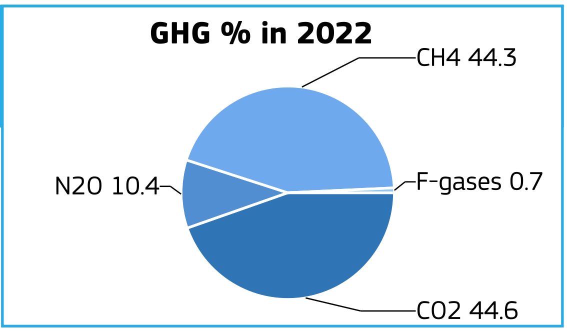
GHG emissions by sector



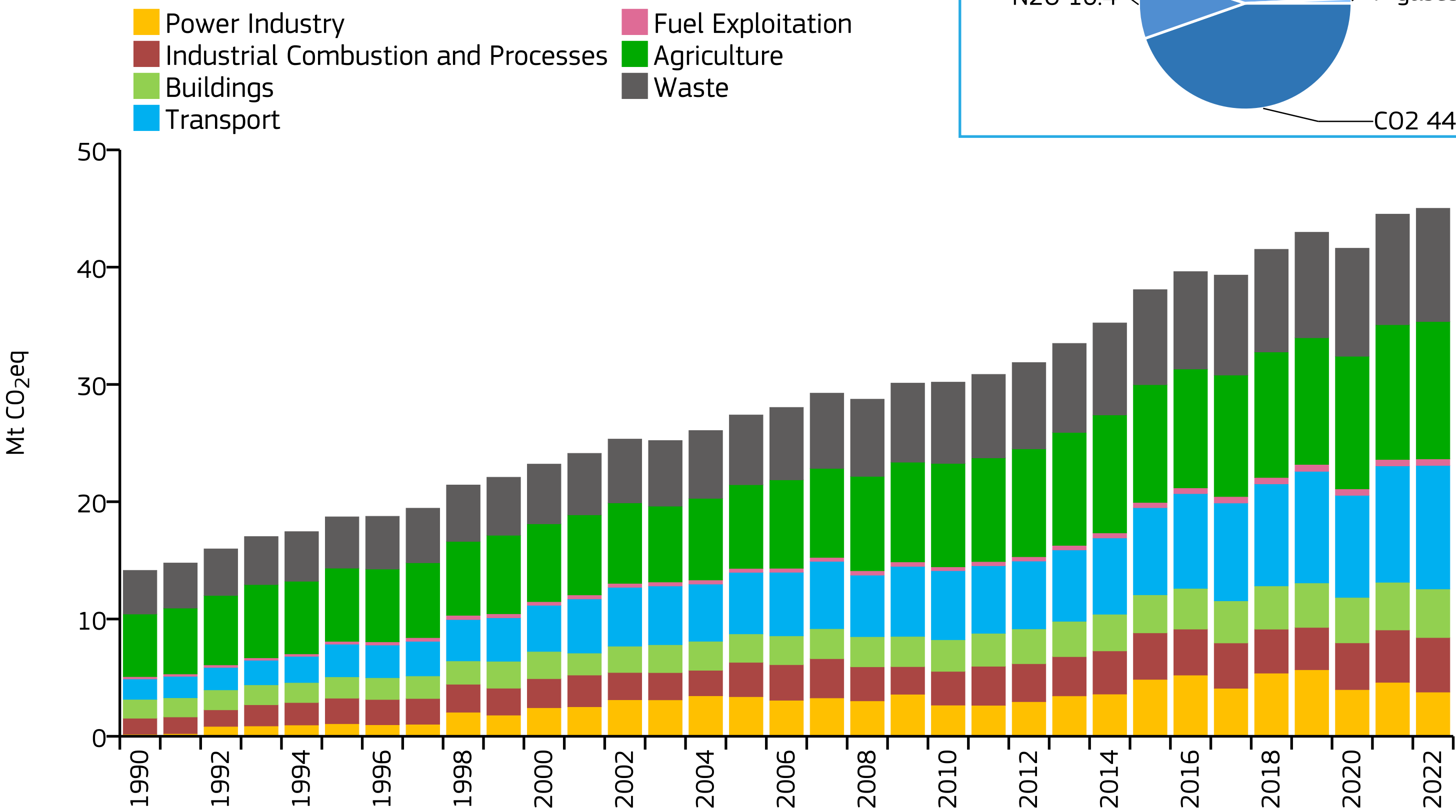
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.260	2.813	n/a	448.000k
2015	1.238	2.749	n/a	450.418k
2005	0.991	2.256	n/a	439.552k
1990	0.959	2.486	n/a	385.878k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+64%	+44%	+4%
Industrial Combustion and Processes	+4%	+37%	+1%
Buildings	-57%	-20%	+4%
Transport	+80%	+52%	+4%
Fuel Exploitation	+58%	-9%	0%
Agriculture	+4%	-8%	0%
Waste	+30%	+9%	0%
All sectors	+31%	+27%	+2%

Guatemala



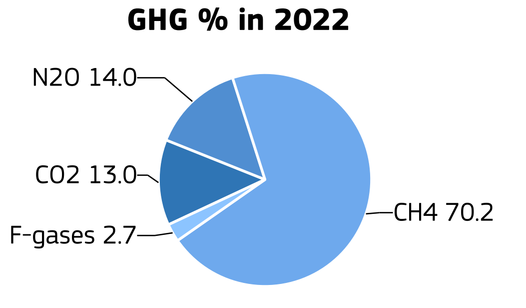
GHG emissions by sector



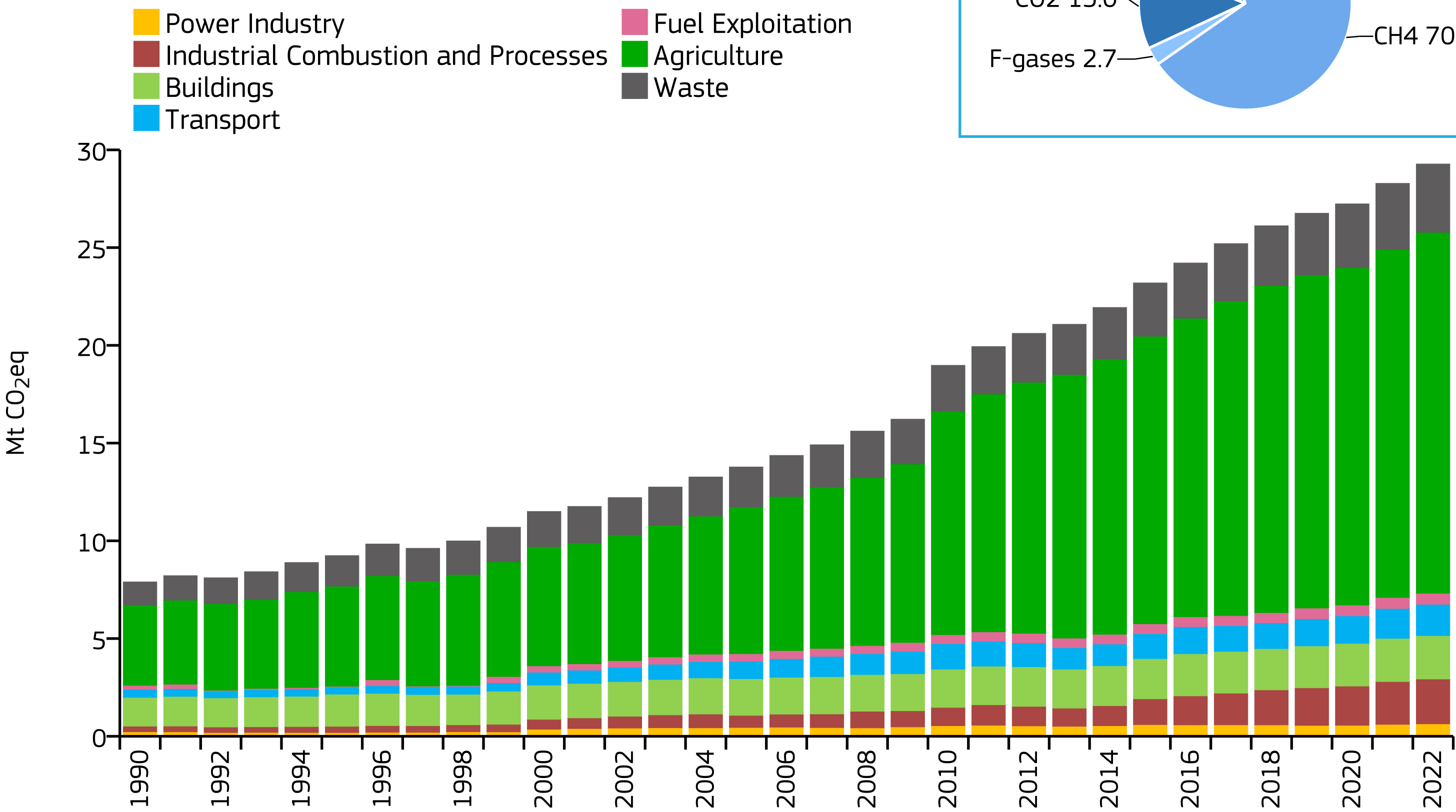
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.018	2.423	0.283	18.577M
2015	38.083	2.343	0.301	16.252M
2005	27.403	2.092	0.313	13.096M
1990	14.151	1.528	0.281	9.264M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+12%	-18%
Industrial Combustion and Processes	+241%	+59%	+4%
Buildings	+158%	+71%	+2%
Transport	> +300%	+101%	+6%
Fuel Exploitation	+179%	+69%	+2%
Agriculture	+120%	+64%	+2%
Waste	+159%	+62%	+2%
All sectors	+218%	+64%	+1%

Guinea



GHG emissions by sector

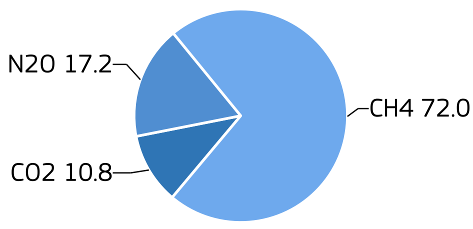


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	29.280	2.023	0.783	14.475M
2015	23.197	1.918	0.972	12.091M
2005	13.781	1.424	0.843	9.680M
1990	7.901	1.308	0.825	6.041M

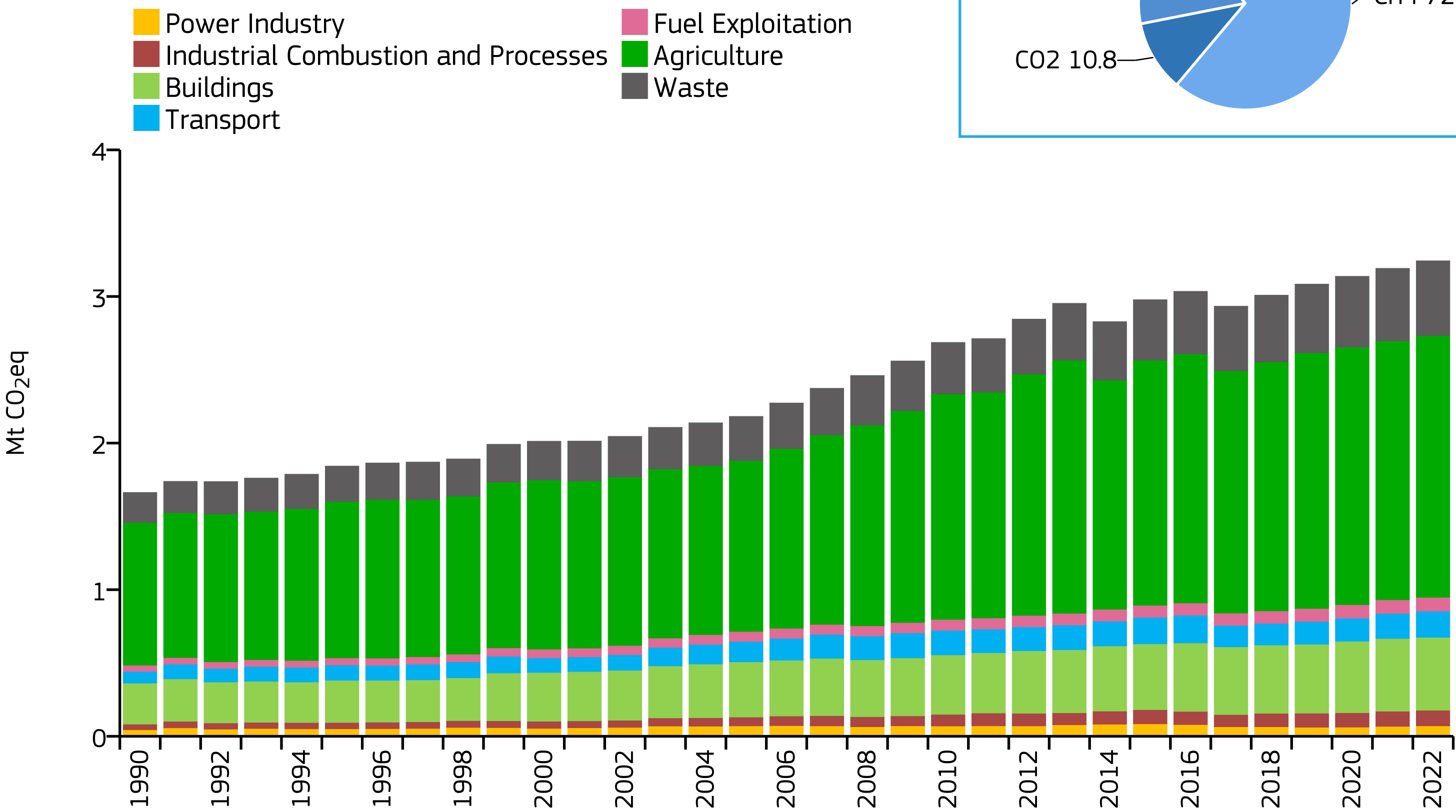
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+181%	+42%	+5%
Industrial Combustion and Processes	> +300%	+270%	+5%
Buildings	+51%	+18%	+1%
Transport	+296%	+81%	+5%
Fuel Exploitation	+164%	+44%	0%
Agriculture	> +300%	+146%	+4%
Waste	+194%	+70%	+3%
All sectors	+271%	+112%	+4%

Guinea-Bissau

GHG % in 2022



GHG emissions by sector

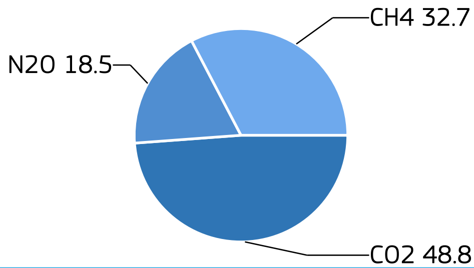


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3.243	1.547	0.830	2.096M
2015	2.978	1.682	0.952	1.771M
2005	2.182	1.580	0.967	1.381M
1990	1.663	1.643	0.855	1.012M

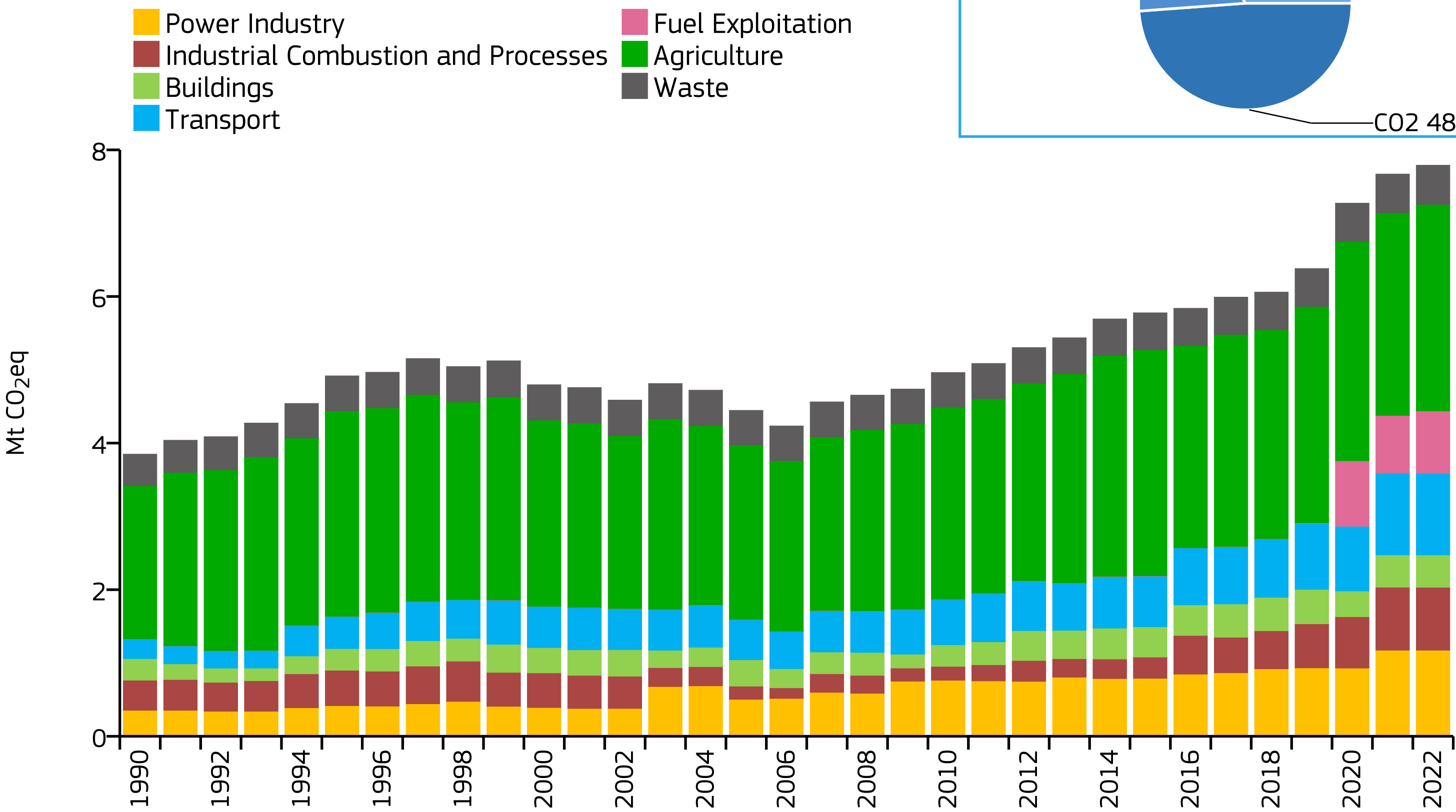
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+60%	+1%	+5%
Industrial Combustion and Processes	+176%	+76%	+3%
Buildings	+78%	+32%	0%
Transport	+125%	+28%	+5%
Fuel Exploitation	+121%	+40%	0%
Agriculture	+83%	+53%	+1%
Waste	+149%	+69%	+3%
All sectors	+95%	+49%	+2%

Guyana

GHG % in 2022



GHG emissions by sector

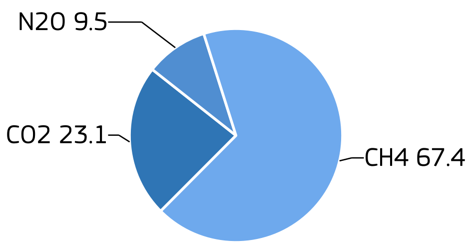


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	7.791	9.751	0.280	799.000k
2015	5.778	7.518	0.669	768.514k
2005	4.447	5.922	0.748	750.946k
1990	3.849	5.178	1.069	743.309k

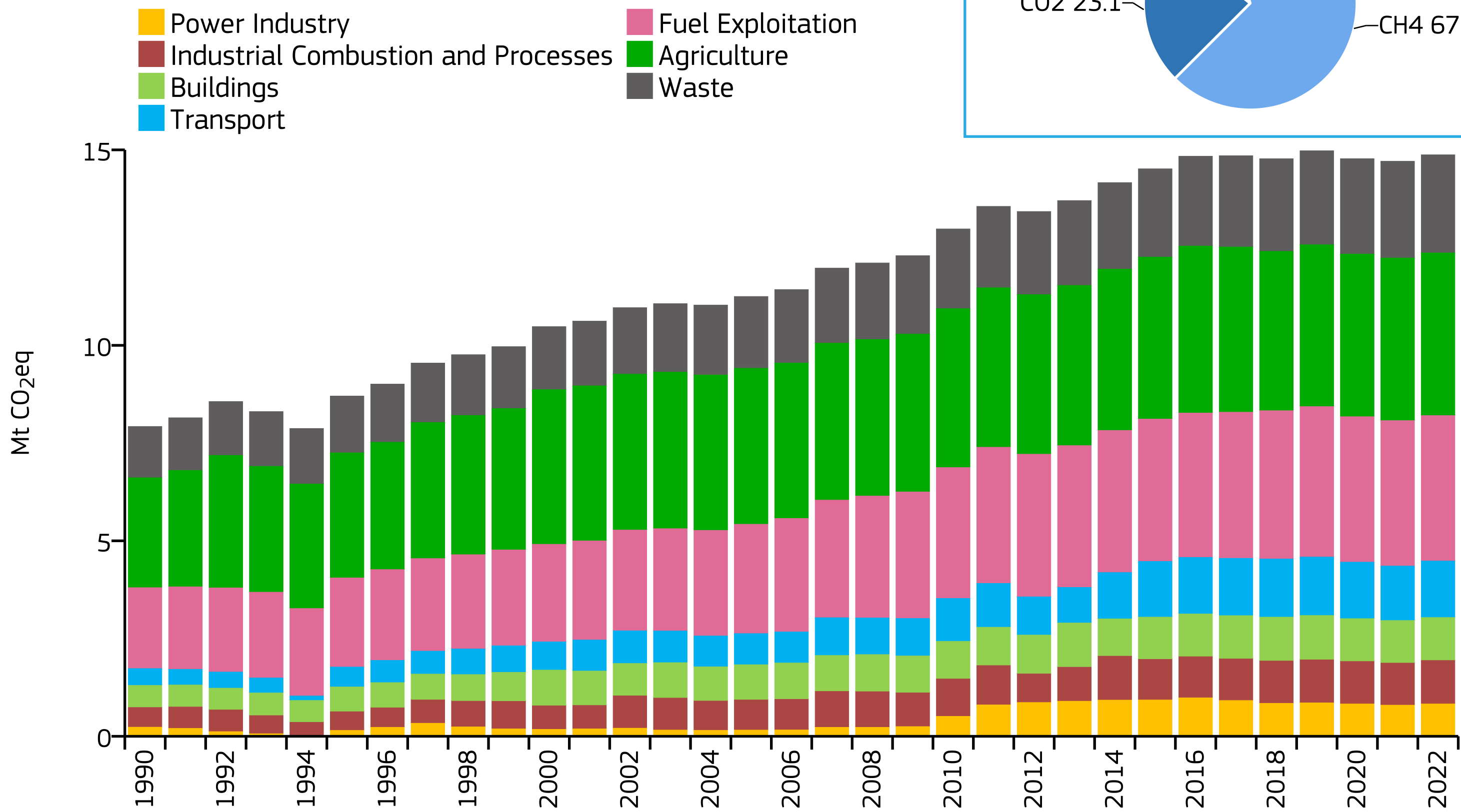
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+232%	+133%	0%
Industrial Combustion and Processes	+109%	> +300%	0%
Buildings	+50%	+23%	0%
Transport	> +300%	+104%	0%
Fuel Exploitation	> +300%	> +300%	+8%
Agriculture	+35%	+18%	+2%
Waste	+24%	+13%	+1%
All sectors	+102%	+75%	+2%

Haiti

GHG % in 2022



GHG emissions by sector

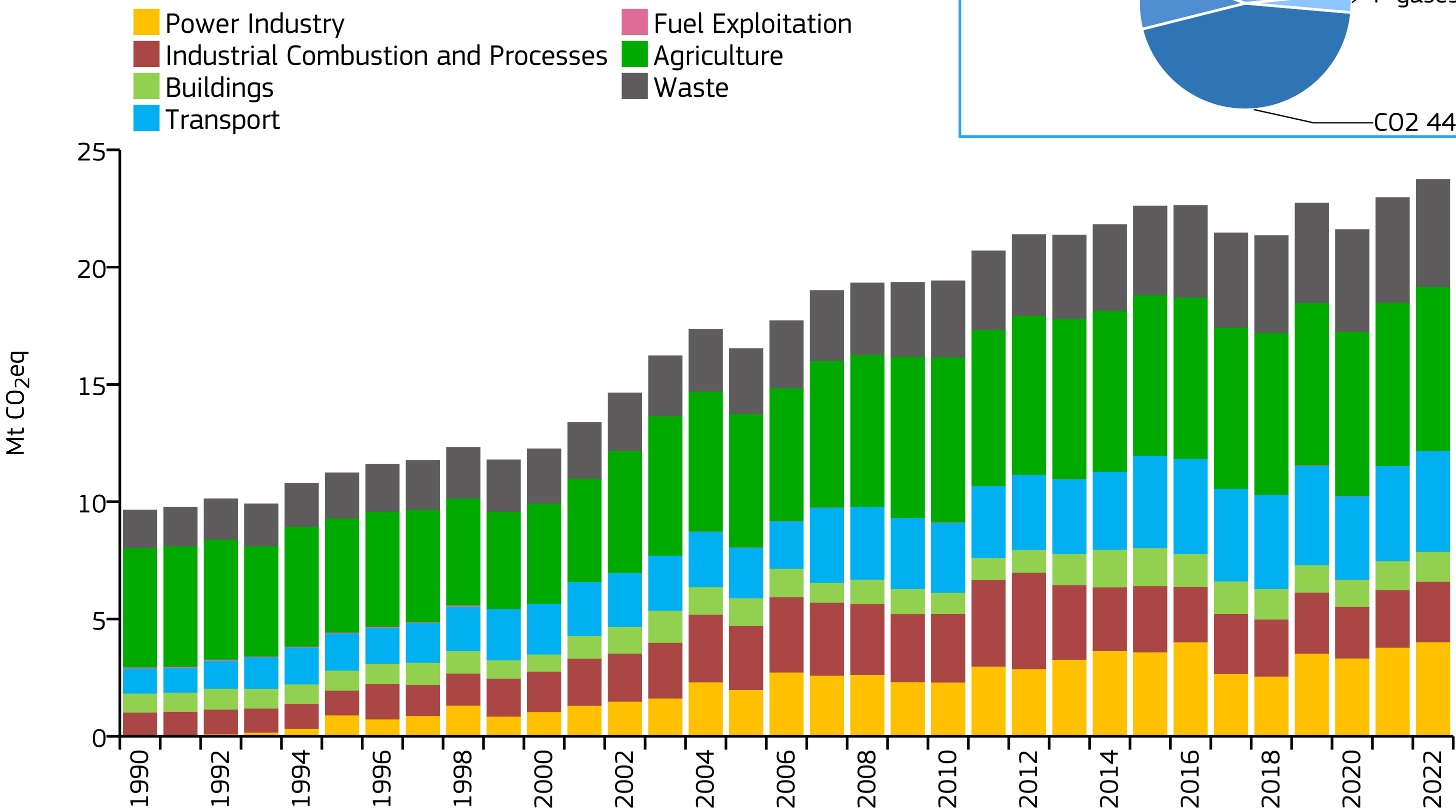


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	14.874	1.280	0.459	11.623M
2015	14.516	1.355	0.436	10.711M
2005	11.251	1.215	0.424	9.263M
1990	7.925	1.116	0.317	7.100M

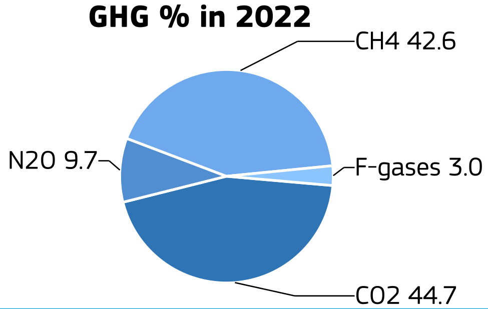
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+240%	> +300%	+4%
Industrial Combustion and Processes	+121%	+44%	+3%
Buildings	+95%	+22%	+1%
Transport	+235%	+82%	+4%
Fuel Exploitation	+80%	+33%	0%
Agriculture	+48%	+4%	0%
Waste	+92%	+37%	+1%
All sectors	+88%	+32%	+1%

Honduras

GHG emissions by sector



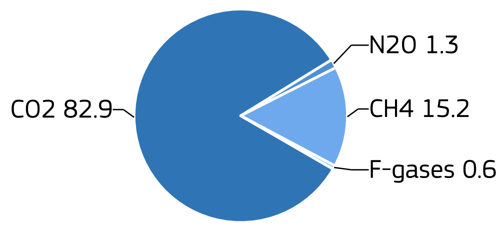
GHG % in 2022



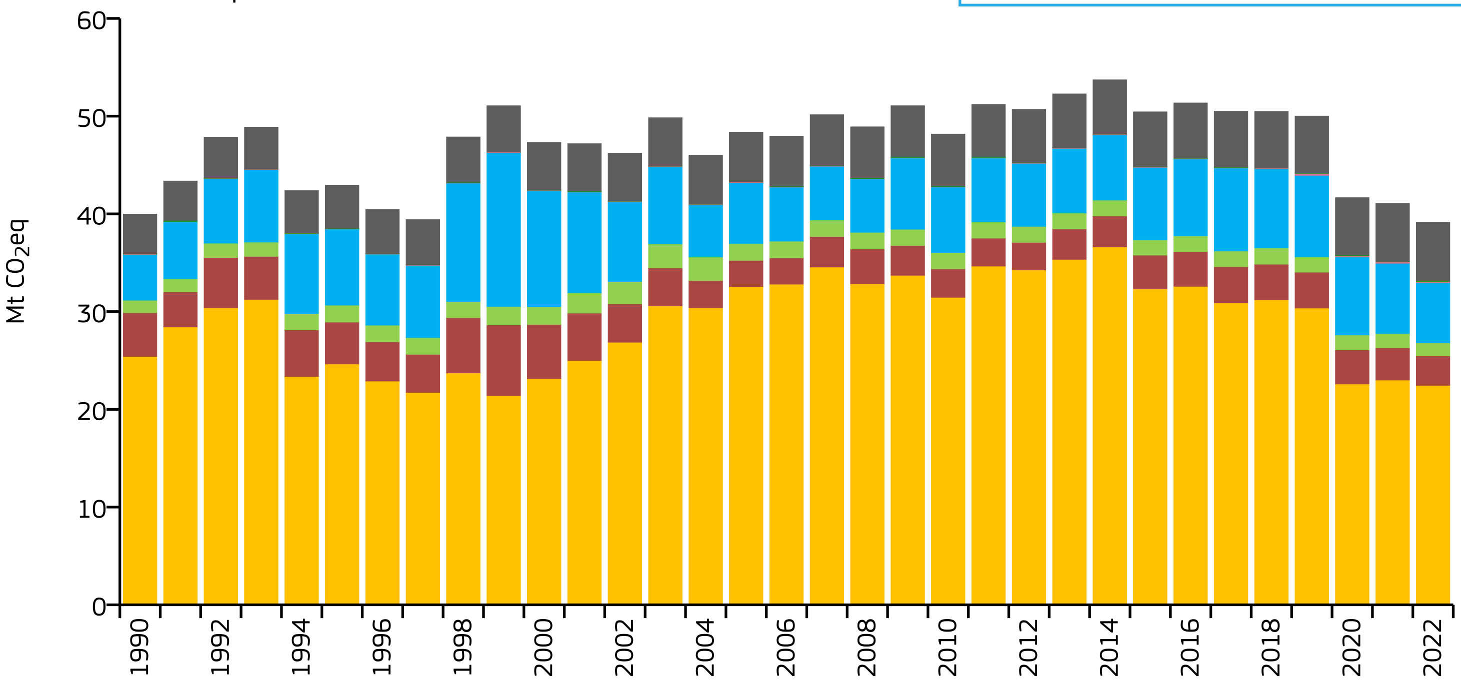
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	23.745	2.370	0.399	10.017M
2015	22.609	2.523	0.470	8.961M
2005	16.526	2.241	0.487	7.373M
1990	9.653	1.948	0.488	4.955M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+103%	+6%
Industrial Combustion and Processes	+159%	-6%	+5%
Buildings	+56%	+8%	+3%
Transport	> +300%	+99%	+6%
Fuel Exploitation	-98%	> +300%	-12%
Agriculture	+37%	+22%	0%
Waste	+182%	+66%	+3%
All sectors	+146%	+44%	+3%

Hong Kong



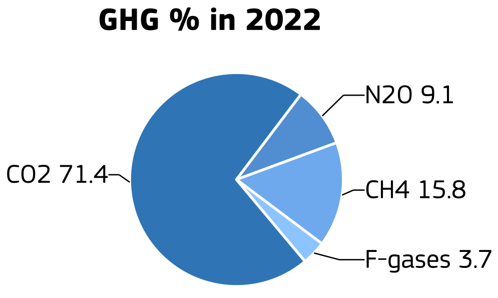
GHG emissions by sector



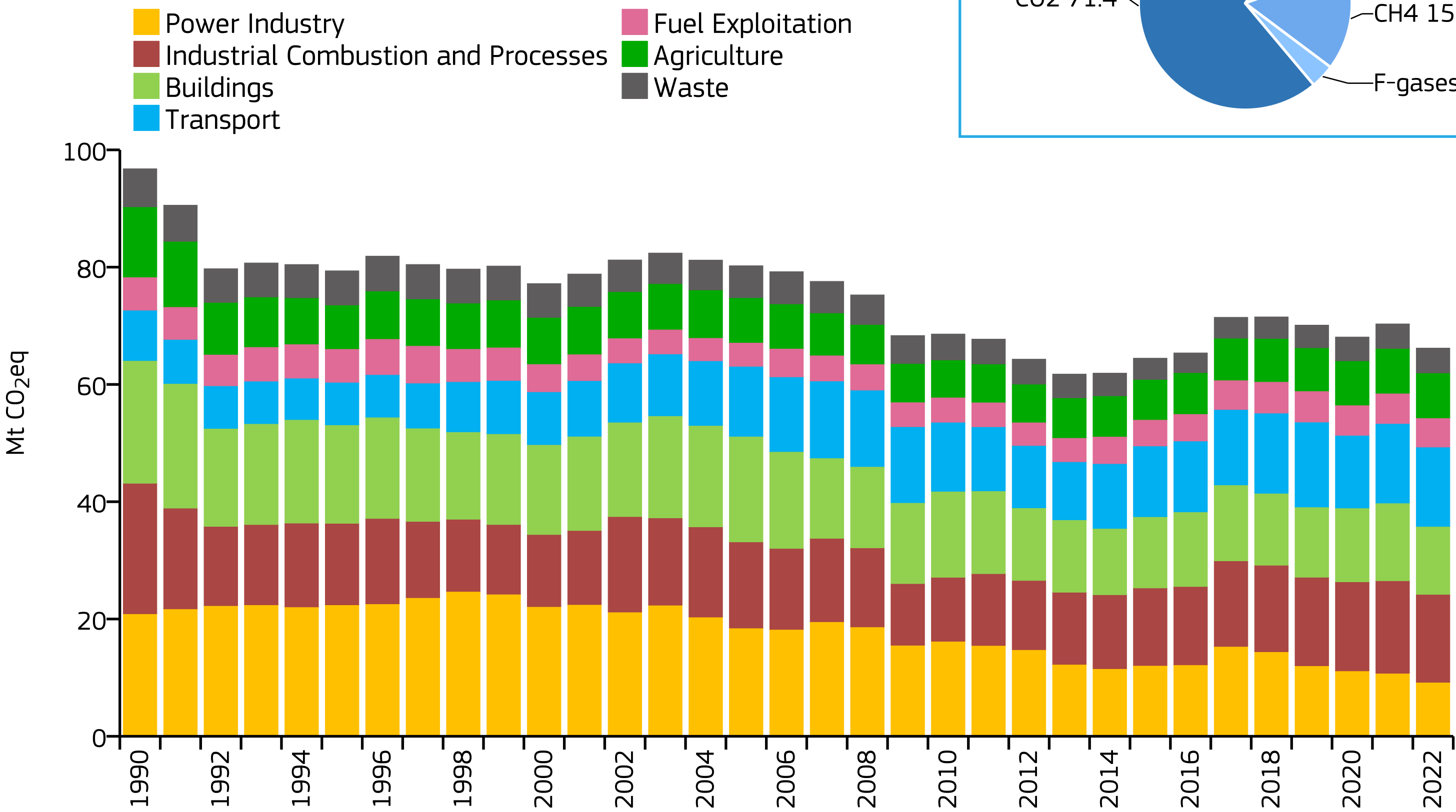
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	39.140	5.121	0.091	7.643M
2015	50.444	6.962	0.121	7.246M
2005	48.364	7.083	0.162	6.828M
1990	39.974	6.914	0.243	5.781M

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-12%	-31%	-2%
Industrial Combustion and Processes	-33%	+12%	-10%
Buildings	+4%	-23%	-7%
Transport	+31%	-1%	-14%
Fuel Exploitation	> +300%	+174%	-7%
Agriculture	-50%	-11%	-1%
Waste	+49%	+19%	+1%
All sectors	-2%	-19%	-5%

Hungary



GHG emissions by sector

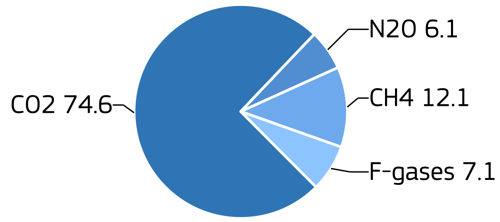


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	66.208	6.932	0.194	9.551M
2015	64.482	6.591	0.238	9.784M
2005	80.244	7.956	0.326	10.086M
1990	96.781	9.326	0.491	10.378M

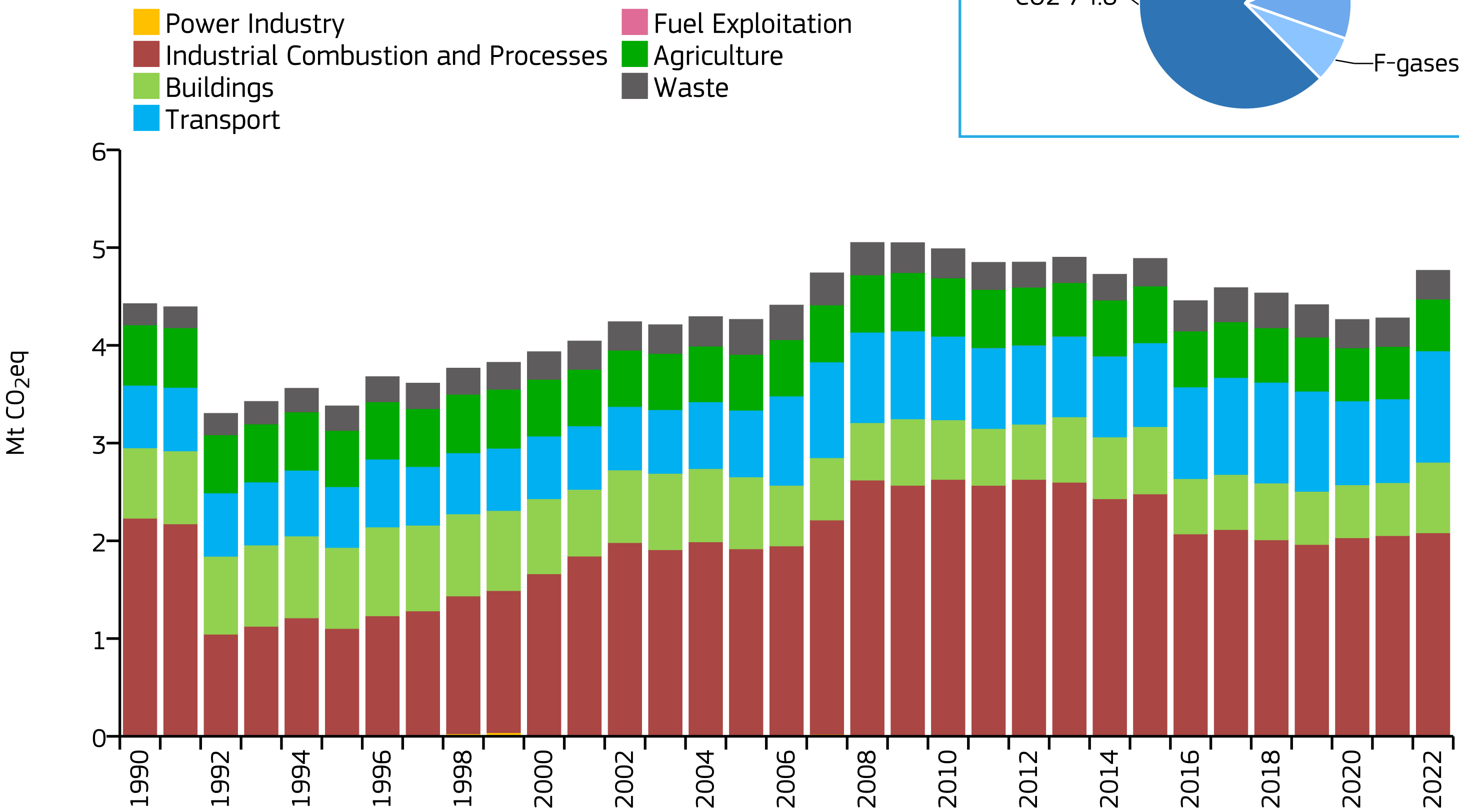
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-56%	-50%	-14%
Industrial Combustion and Processes	-33%	+2%	-5%
Buildings	-45%	-36%	-13%
Transport	+57%	+13%	0%
Fuel Exploitation	-12%	+23%	-4%
Agriculture	-36%	0%	0%
Waste	-35%	-22%	+1%
All sectors	-32%	-17%	-6%

Iceland

GHG % in 2022



GHG emissions by sector

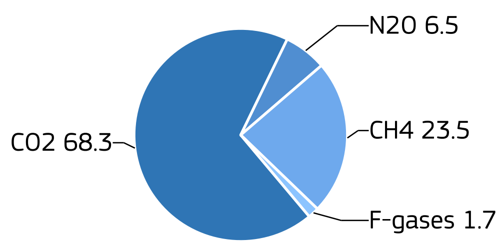


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	4.768	13.702	0.227	348.000k
2015	4.890	14.807	0.283	330.243k
2005	4.266	14.464	0.299	294.979k
1990	4.428	17.360	0.500	255.043k

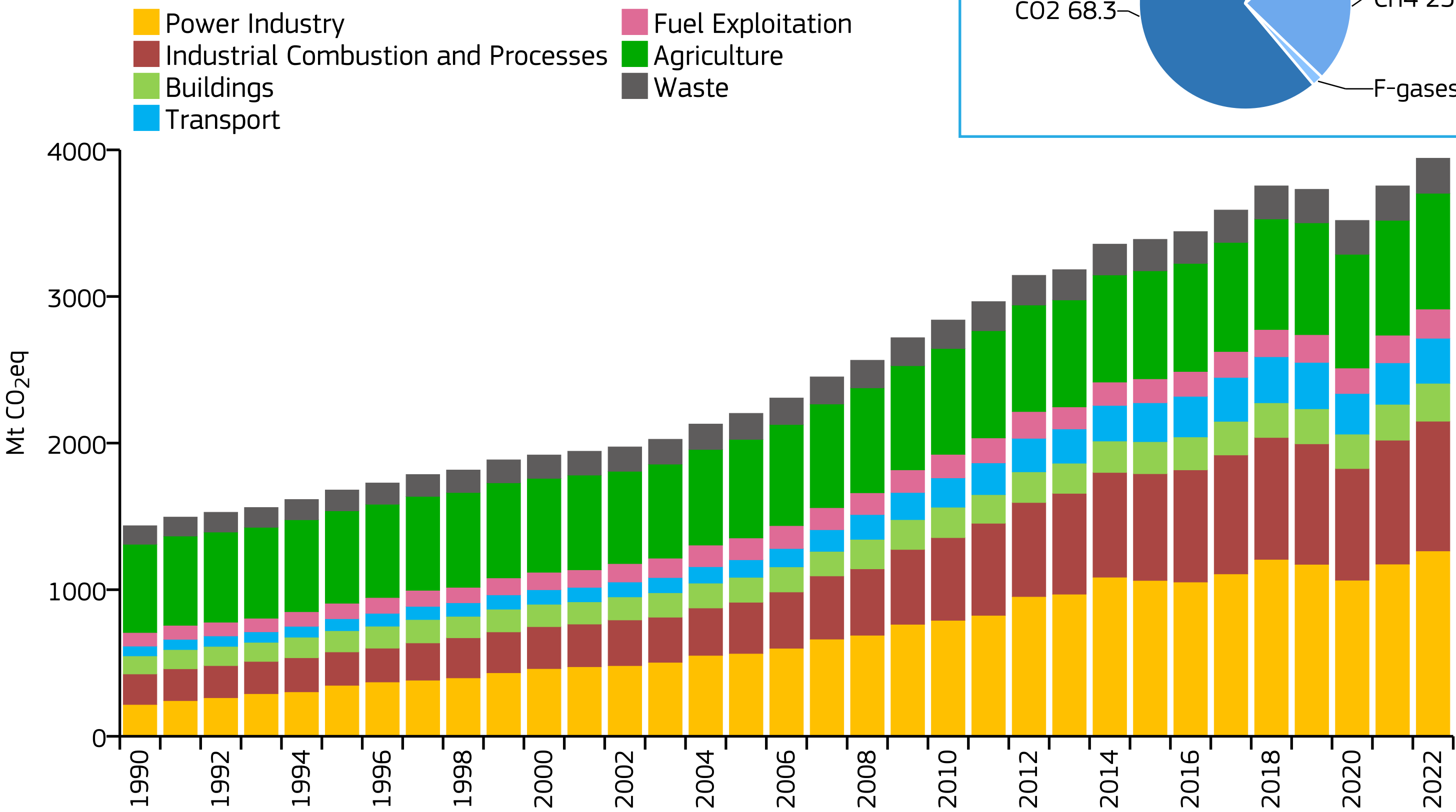
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-25%	-64%	+33%
Industrial Combustion and Processes	-7%	+9%	+1%
Buildings	0%	-2%	+33%
Transport	+78%	+67%	+33%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	-14%	-7%	-1%
Waste	+36%	-18%	+1%
All sectors	+8%	+12%	+11%

India

GHG % in 2022



GHG emissions by sector

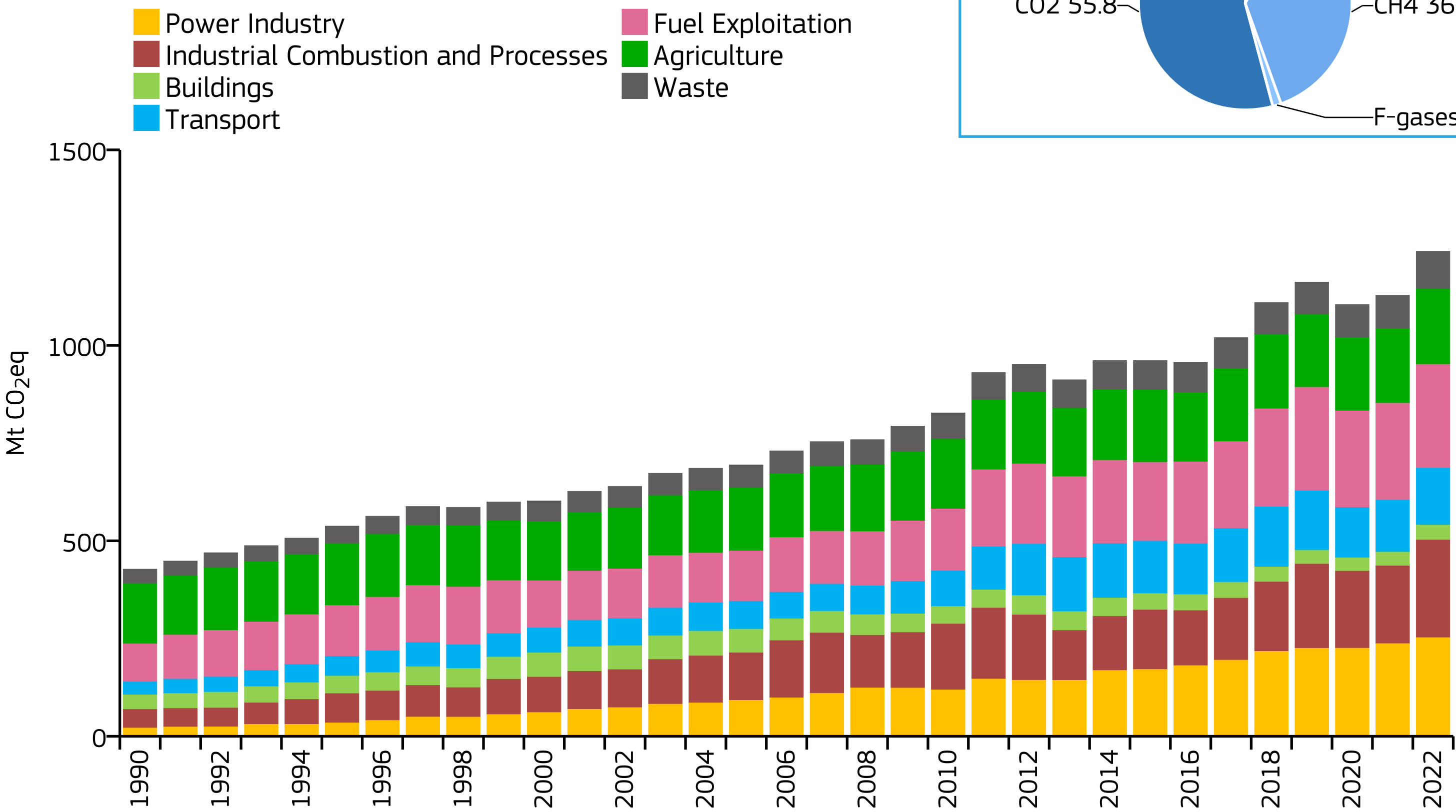


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3943.265	2.794	0.392	1.411G
2015	3389.882	2.590	0.474	1.309G
2005	2203.100	1.926	0.592	1.144G
1990	1436.581	1.651	0.907	870.133M

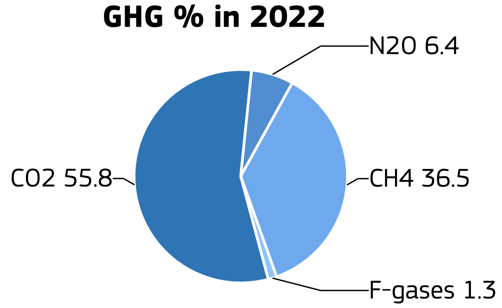
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+124%	+8%
Industrial Combustion and Processes	> +300%	+153%	+5%
Buildings	+110%	+52%	+6%
Transport	> +300%	+157%	+9%
Fuel Exploitation	+115%	+34%	+6%
Agriculture	+31%	+17%	+1%
Waste	+89%	+35%	+2%
All sectors	+174%	+79%	+5%

Indonesia

GHG emissions by sector



GHG % in 2022

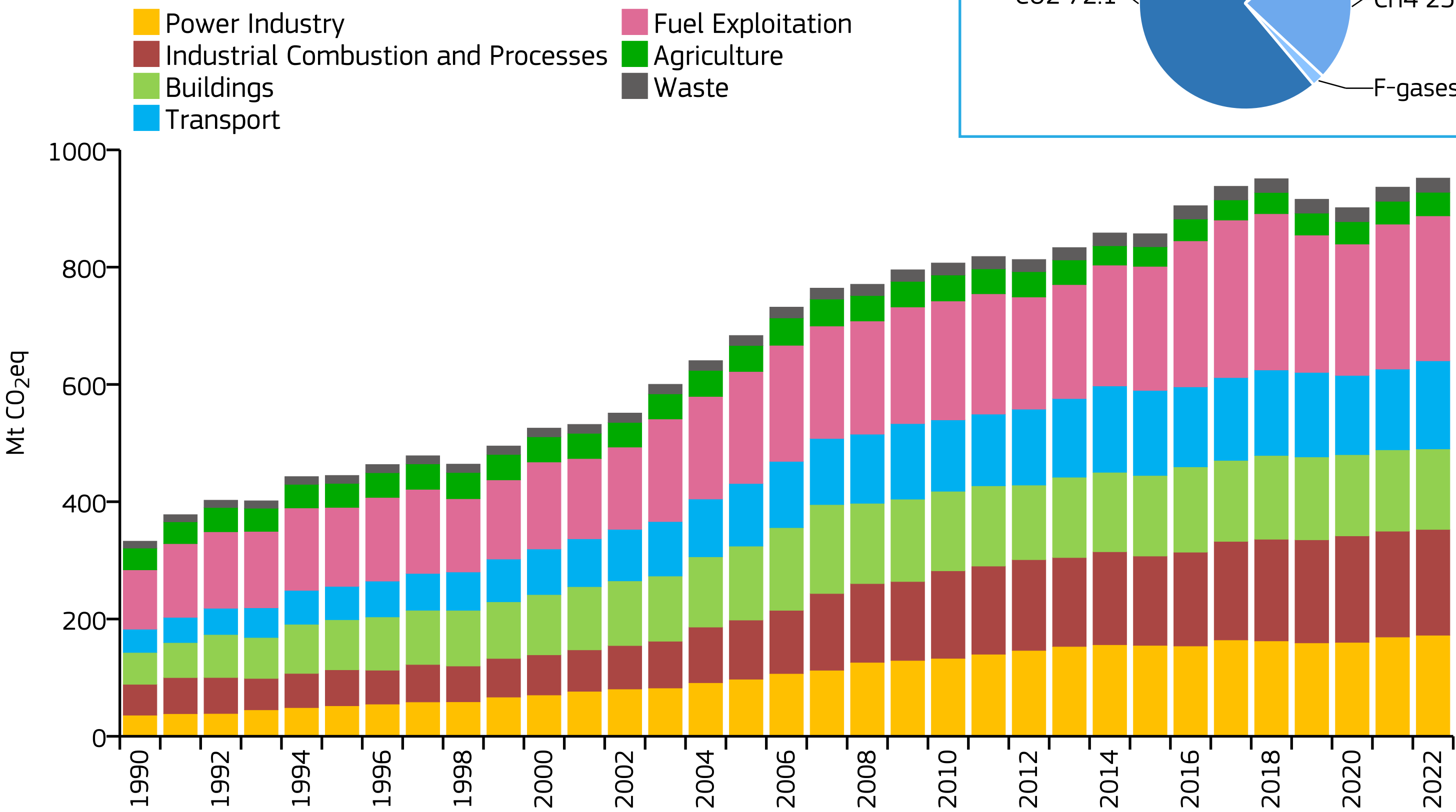


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1240.833	4.473	0.363	277.425M
2015	961.407	3.724	0.367	258.162M
2005	694.314	3.063	0.458	226.713M
1990	427.655	2.357	0.519	181.437M

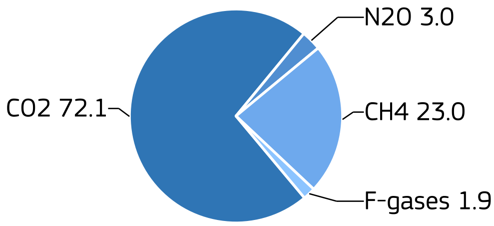
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+172%	+6%
Industrial Combustion and Processes	> +300%	+106%	+26%
Buildings	+2%	-37%	+8%
Transport	> +300%	+104%	+10%
Fuel Exploitation	+171%	+106%	+7%
Agriculture	+25%	+19%	+1%
Waste	+173%	+66%	+13%
All sectors	+190%	+79%	+10%

Iran

GHG emissions by sector



GHG % in 2022

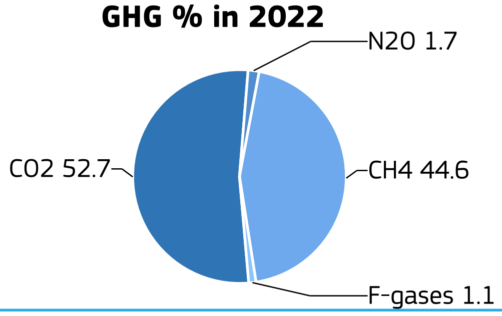


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	951.984	11.202	0.702	84.982M
2015	857.022	10.799	0.748	79.361M
2005	683.557	9.707	0.731	70.422M
1990	332.763	5.918	0.632	56.226M

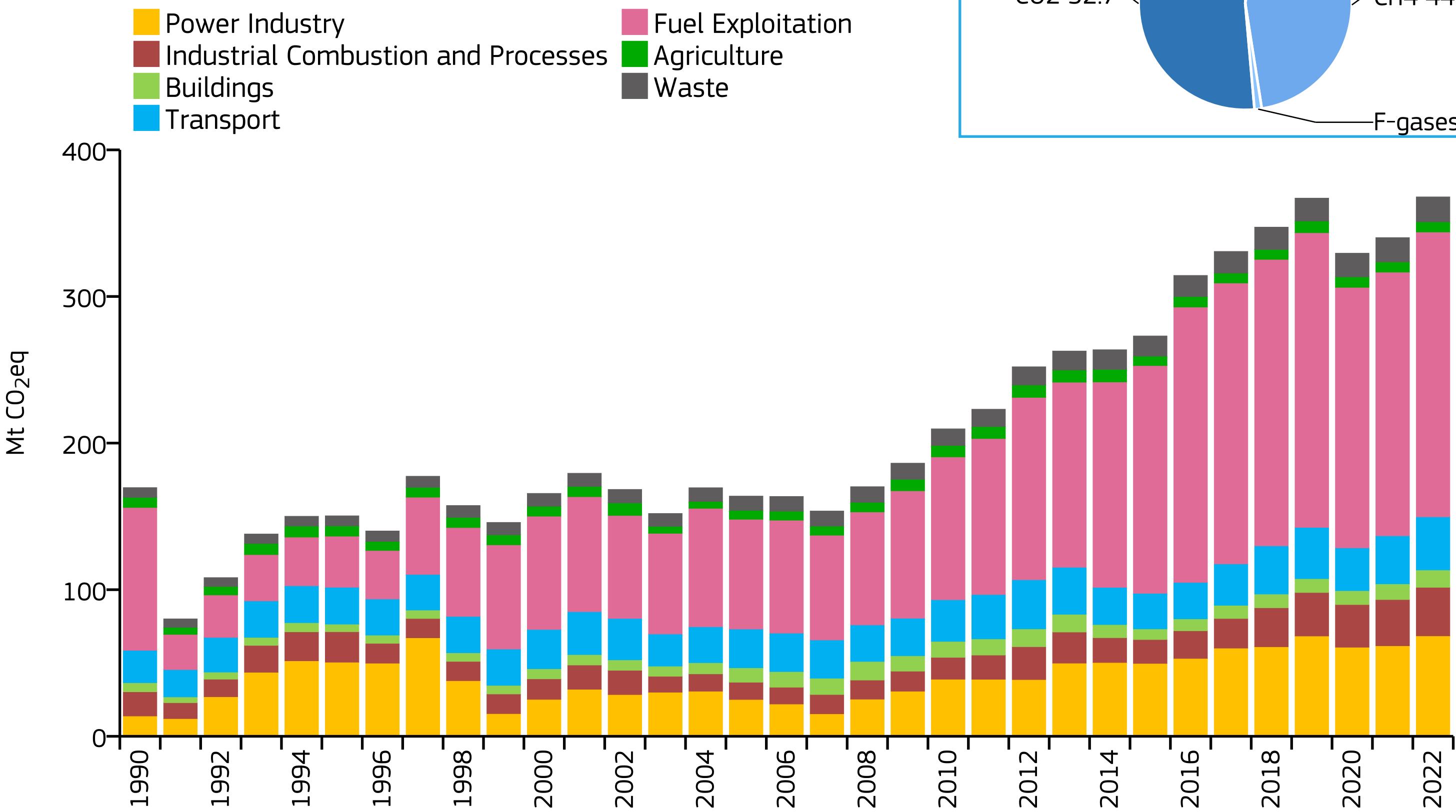
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+77%	+2%
Industrial Combustion and Processes	+243%	+79%	0%
Buildings	+153%	+9%	-1%
Transport	+278%	+41%	+9%
Fuel Exploitation	+144%	+29%	0%
Agriculture	+8%	-10%	+3%
Waste	+104%	+42%	0%
All sectors	+186%	+39%	+2%

Iraq

GHG % in 2022



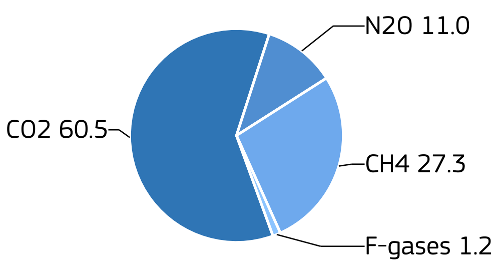
GHG emissions by sector



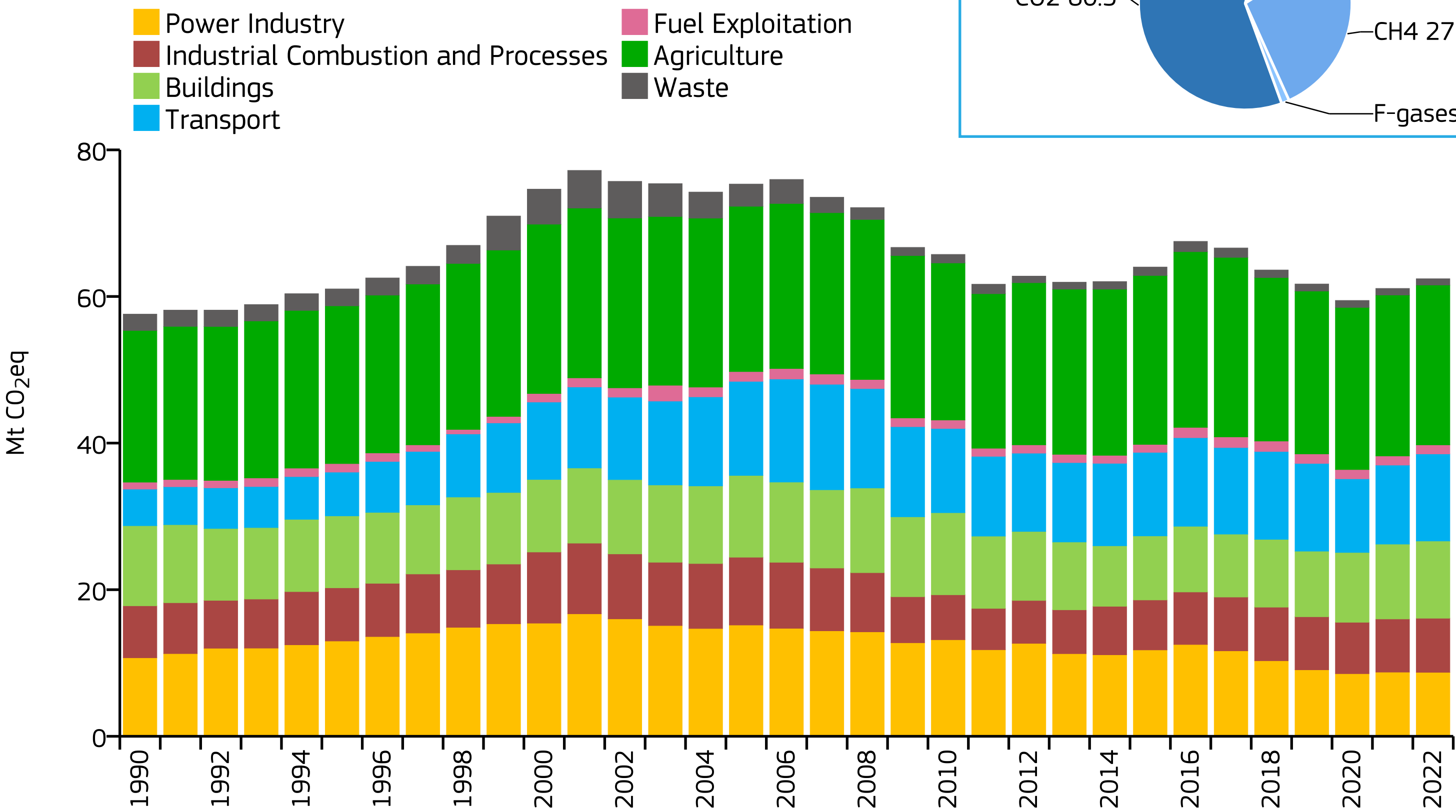
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	367.941	8.413	0.899	43.736M
2015	273.106	7.562	0.772	36.116M
2005	163.849	6.067	0.821	27.008M
1990	169.632	9.710	1.289	17.469M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+173%	+11%
Industrial Combustion and Processes	+101%	+181%	+5%
Buildings	+90%	+20%	+10%
Transport	+64%	+37%	+11%
Fuel Exploitation	+100%	+159%	+8%
Agriculture	0%	+14%	-1%
Waste	+157%	+76%	+3%
All sectors	+117%	+125%	+8%

Ireland



GHG emissions by sector

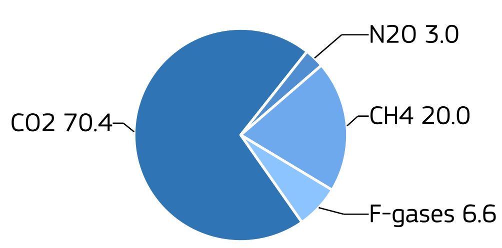


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	62.419	12.579	0.108	4.962M
2015	64.021	13.621	0.190	4.700M
2005	75.339	17.883	0.314	4.213M
1990	57.591	16.135	0.612	3.569M

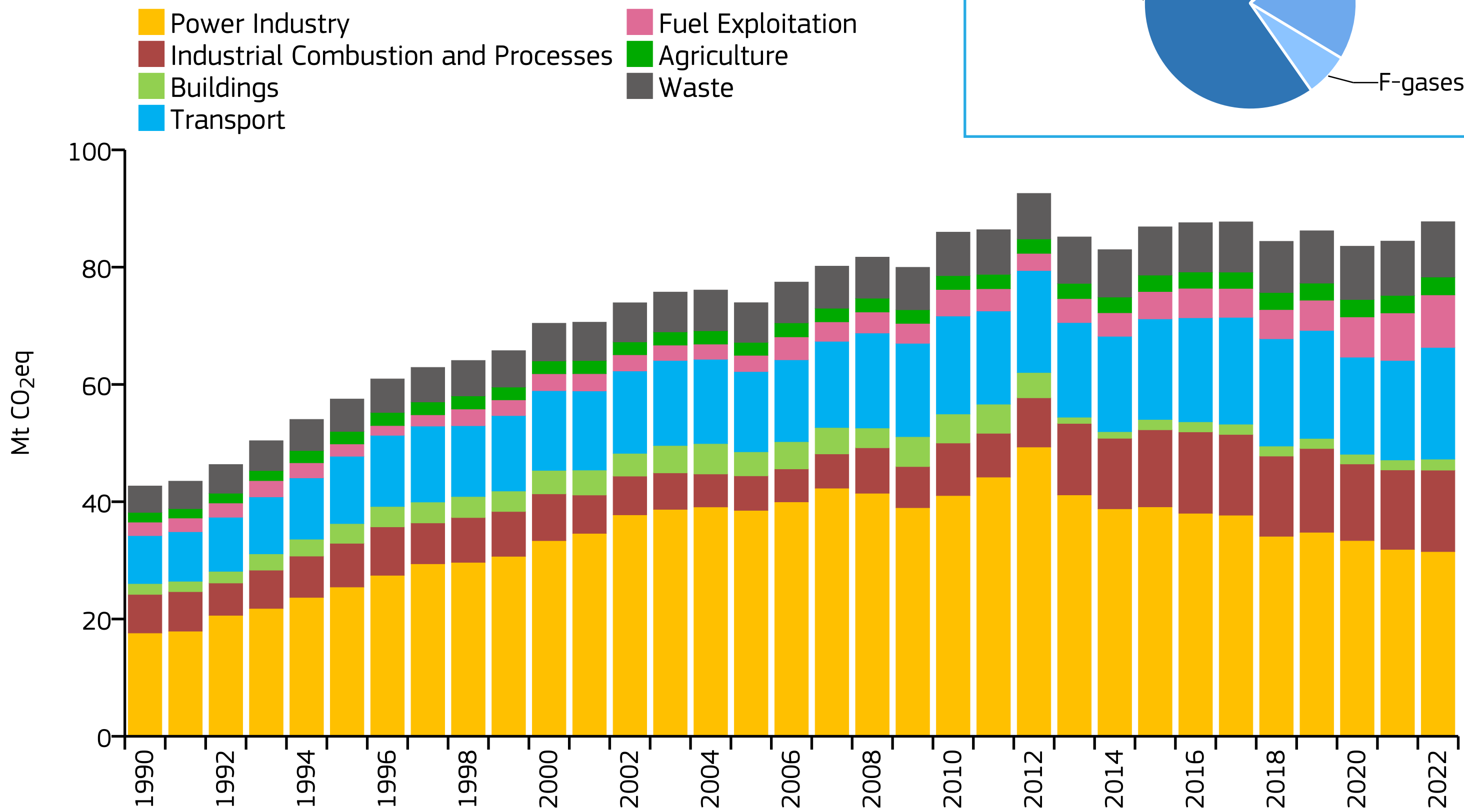
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-19%	-43%	0%
Industrial Combustion and Processes	+4%	-20%	+2%
Buildings	-4%	-6%	+3%
Transport	+138%	-7%	+10%
Fuel Exploitation	+31%	-7%	0%
Agriculture	+5%	-3%	-1%
Waste	-61%	-72%	-5%
All sectors	+8%	-17%	+2%

Israel and Palestine, State of

GHG % in 2022



GHG emissions by sector

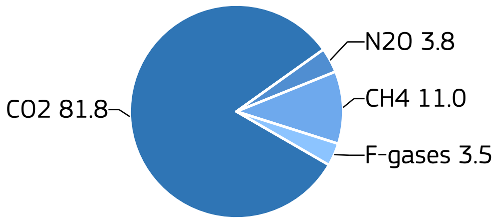


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	87.754	6.024	0.194	14.568M
2015	86.879	6.826	0.255	12.727M
2005	73.941	7.264	0.323	10.179M
1990	42.693	6.467	0.404	6.601M

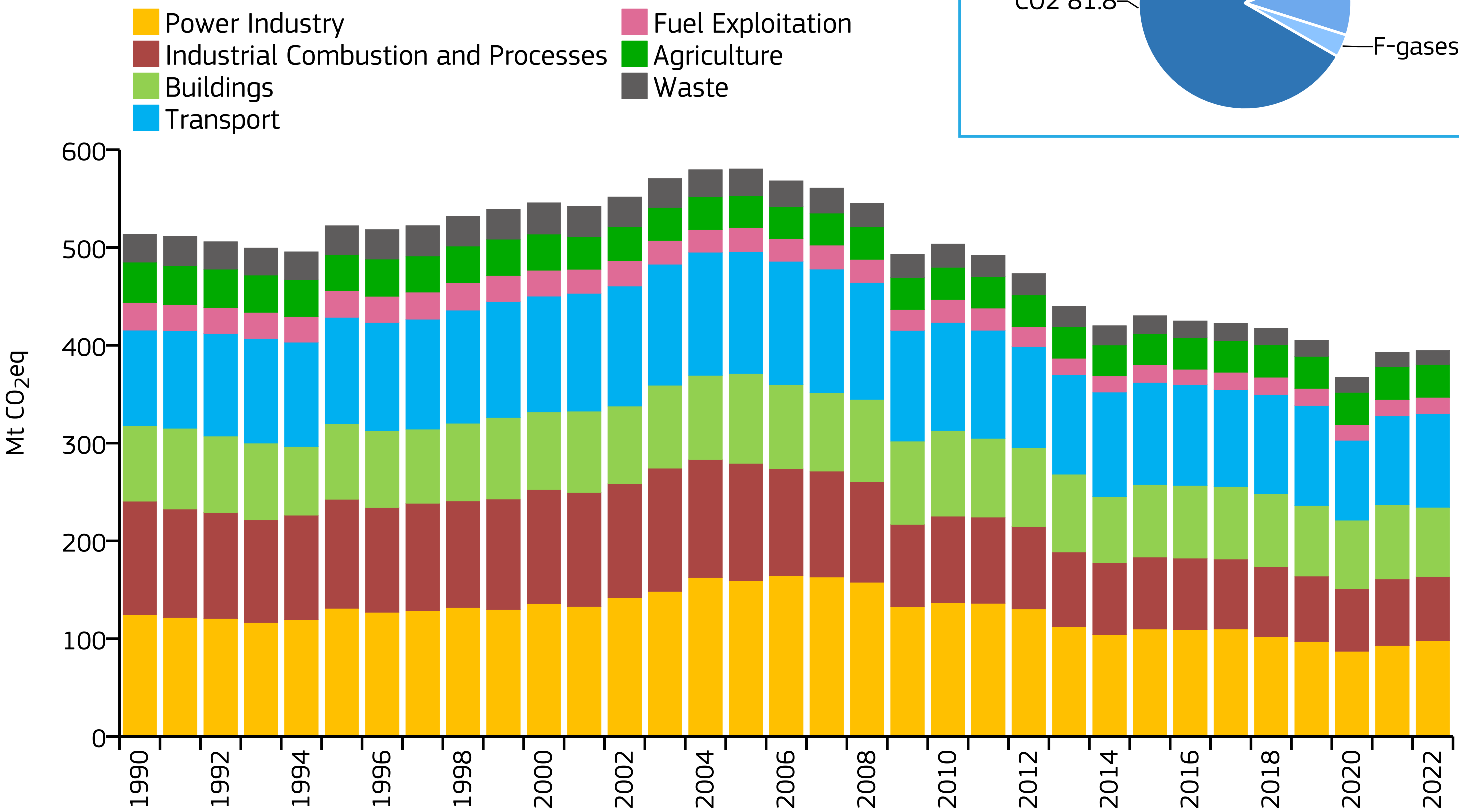
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+79%	-18%	-1%
Industrial Combustion and Processes	+111%	+136%	+2%
Buildings	+2%	-54%	+10%
Transport	+133%	+39%	+12%
Fuel Exploitation	+289%	+222%	+11%
Agriculture	+83%	+37%	+1%
Waste	+109%	+40%	+2%
All sectors	+106%	+19%	+4%

Italy, San Marino and the Holy See

GHG % in 2022



GHG emissions by sector

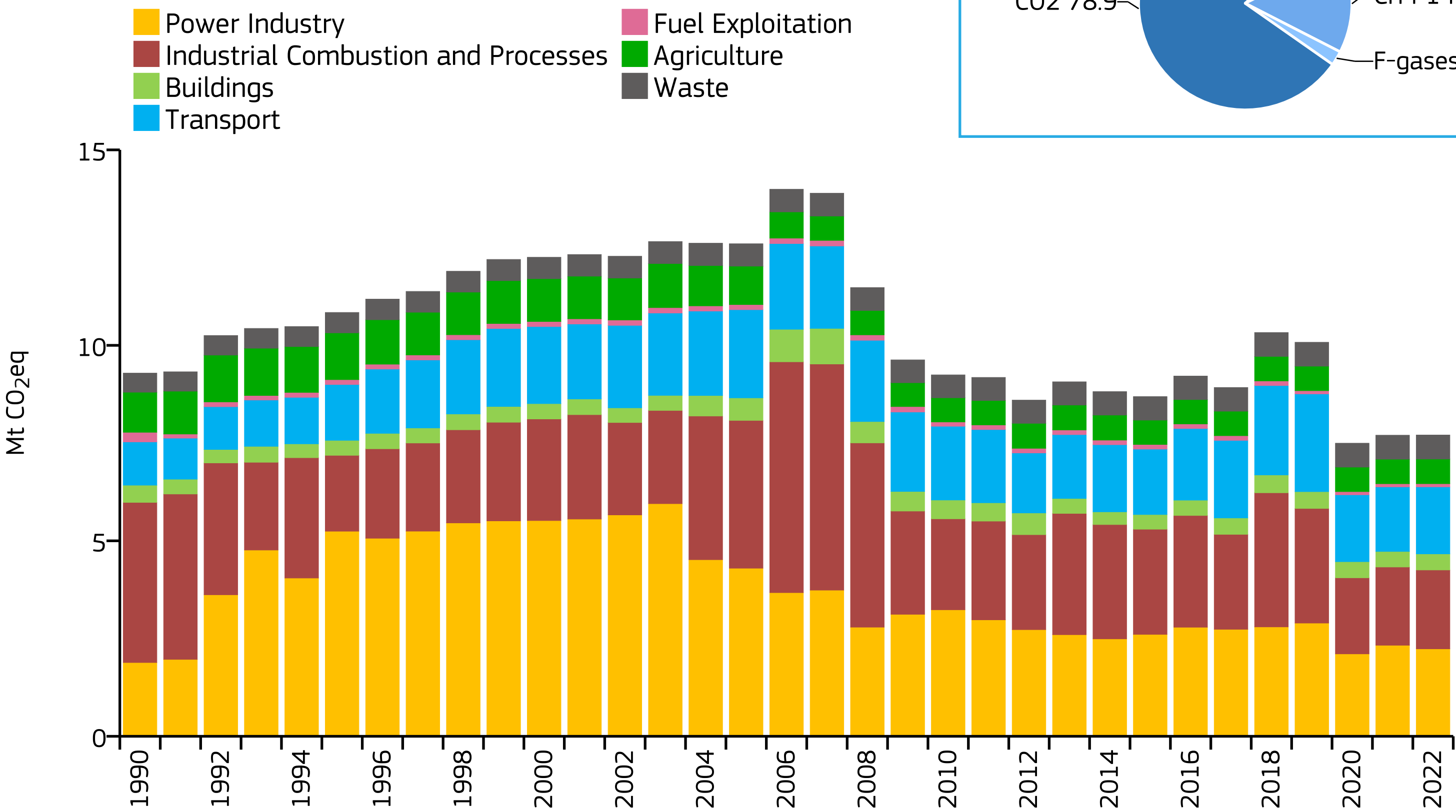


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	394.748	6.698	0.153	58.937M
2015	430.297	7.231	0.176	59.504M
2005	580.427	9.870	0.226	58.809M
1990	513.738	8.993	0.248	57.127M

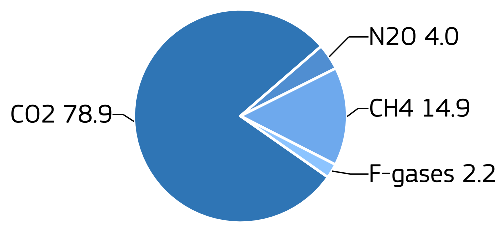
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-21%	-39%	+5%
Industrial Combustion and Processes	-44%	-45%	-4%
Buildings	-8%	-23%	-6%
Transport	-2%	-23%	+5%
Fuel Exploitation	-41%	-32%	0%
Agriculture	-19%	+3%	0%
Waste	-50%	-48%	-4%
All sectors	-23%	-32%	0%

Jamaica

GHG emissions by sector



GHG % in 2022

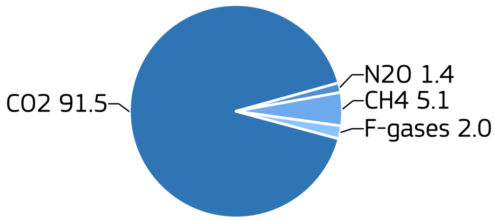


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	7.707	2.636	0.272	2.924M
2015	8.689	3.026	0.317	2.872M
2005	12.598	4.590	0.464	2.745M
1990	9.290	3.832	0.447	2.424M

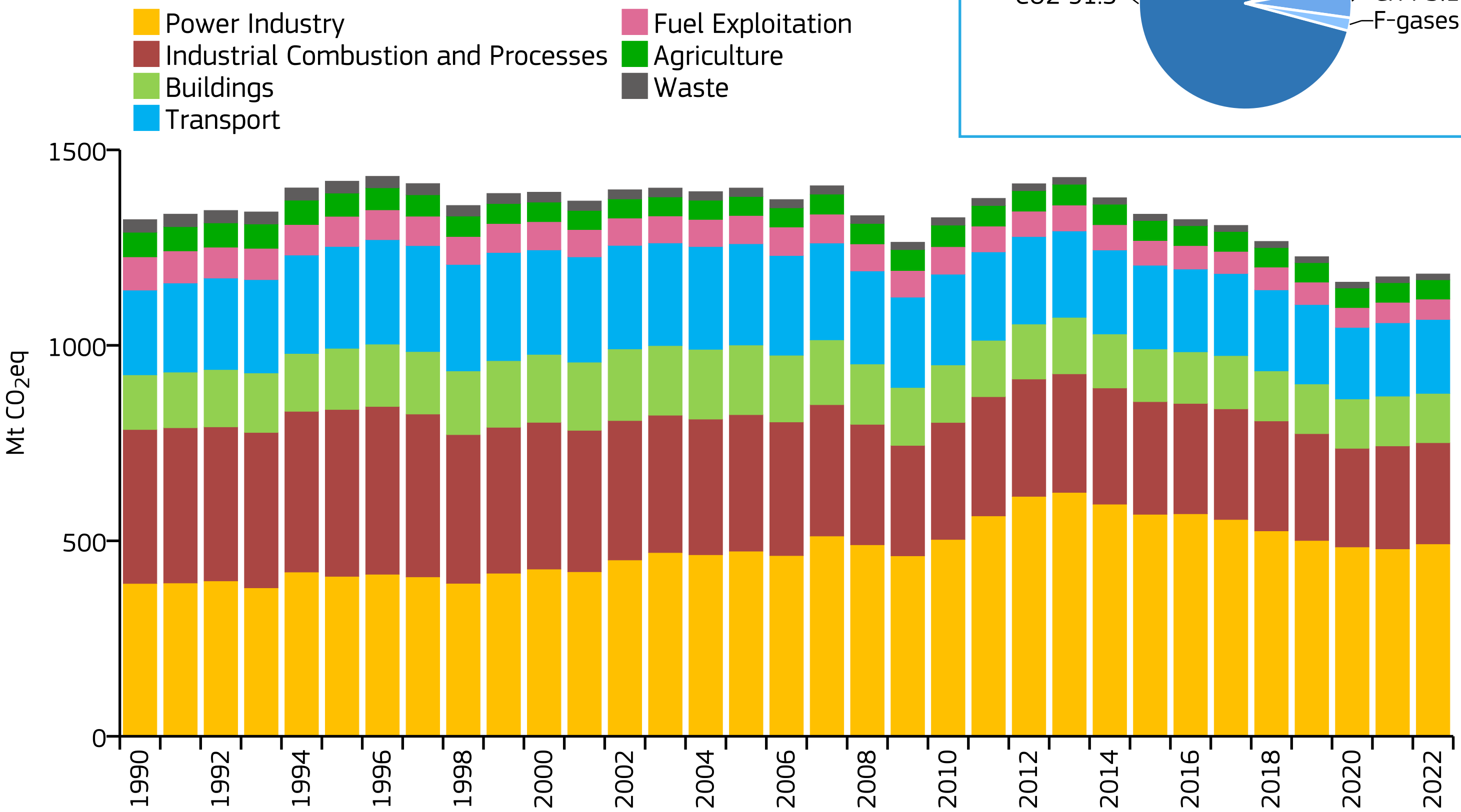
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+19%	-48%	-4%
Industrial Combustion and Processes	-51%	-47%	+1%
Buildings	-7%	-29%	+3%
Transport	+55%	-24%	+4%
Fuel Exploitation	-67%	-38%	0%
Agriculture	-39%	-36%	0%
Waste	+26%	+7%	0%
All sectors	-17%	-39%	0%

Japan

GHG % in 2022



GHG emissions by sector

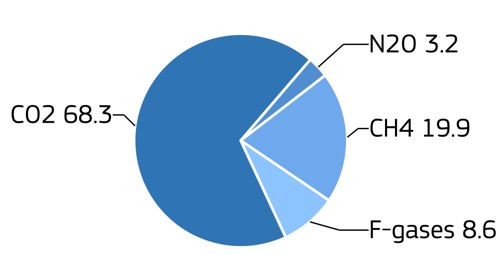


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1182.770	9.410	0.227	125.697M
2015	1335.568	10.436	0.260	127.975M
2005	1402.608	10.929	0.287	128.336M
1990	1321.808	10.616	0.326	124.516M

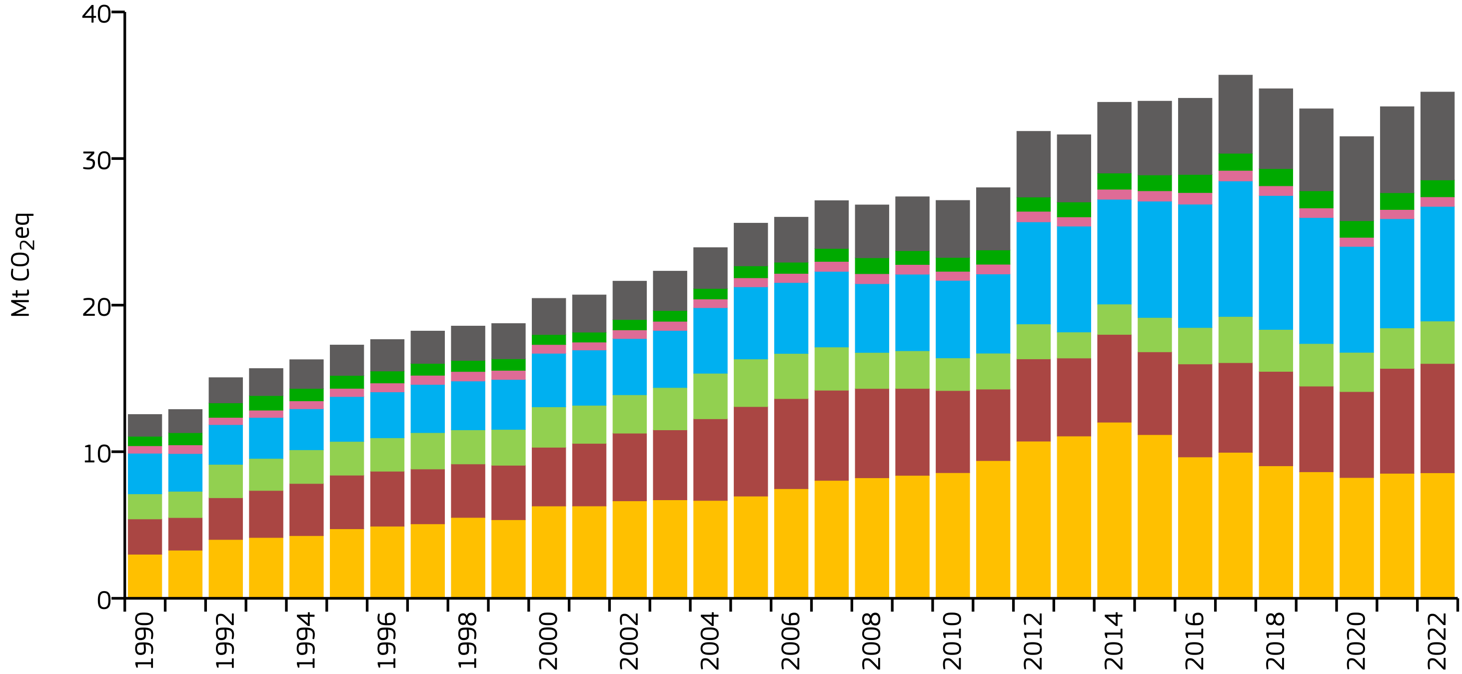
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+26%	+4%	+3%
Industrial Combustion and Processes	-34%	-26%	-2%
Buildings	-10%	-29%	-1%
Transport	-13%	-27%	+1%
Fuel Exploitation	-39%	-28%	-1%
Agriculture	-21%	+2%	-1%
Waste	-54%	-31%	-1%
All sectors	-11%	-16%	+1%

Jordan

GHG % in 2022



GHG emissions by sector

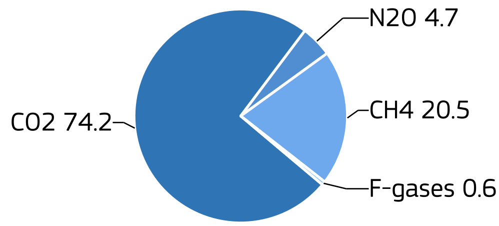


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	34.539	3.319	0.328	10.405M
2015	33.918	3.703	0.360	9.159M
2005	25.593	4.479	0.419	5.714M
1990	12.542	3.522	0.443	3.561M

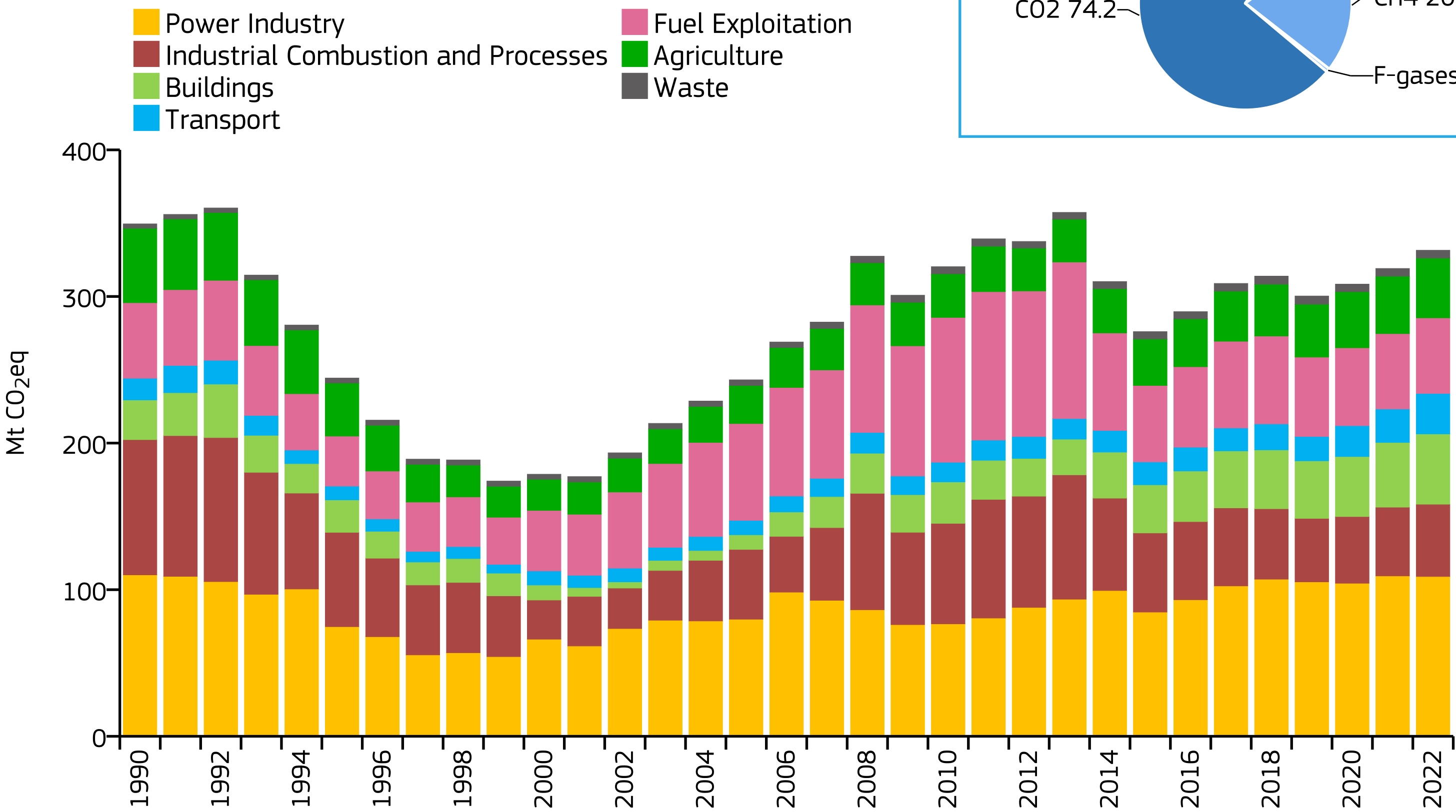
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+185%	+23%	0%
Industrial Combustion and Processes	+210%	+22%	+4%
Buildings	+69%	-11%	+5%
Transport	+182%	+59%	+5%
Fuel Exploitation	+28%	+6%	+4%
Agriculture	+78%	+42%	+1%
Waste	> +300%	+106%	+2%
All sectors	+175%	+35%	+3%

Kazakhstan

GHG % in 2022



GHG emissions by sector

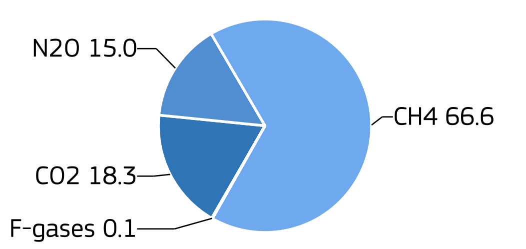


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	331.530	17.329	0.648	19.131M
2015	276.035	15.552	0.648	17.750M
2005	243.169	15.646	0.971	15.541M
1990	349.541	21.133	1.587	16.540M

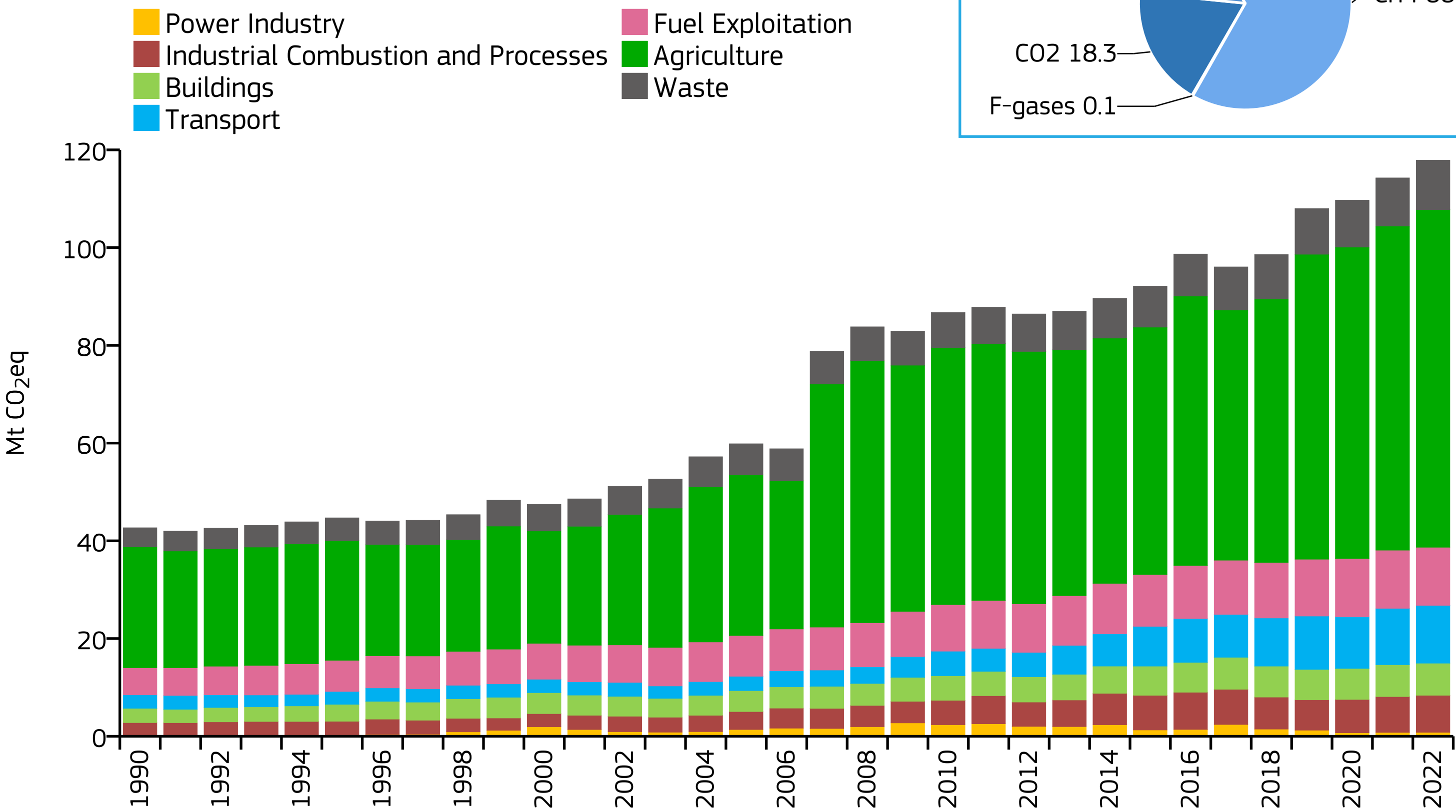
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-1%	+36%	0%
Industrial Combustion and Processes	-47%	+4%	+5%
Buildings	+77%	> +300%	+8%
Transport	+87%	+181%	+21%
Fuel Exploitation	0%	-22%	0%
Agriculture	-20%	+57%	+4%
Waste	+76%	+37%	+1%
All sectors	-5%	+36%	+4%

Kenya

GHG % in 2022



GHG emissions by sector

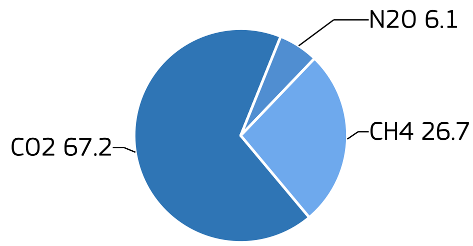


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	117.895	2.102	0.447	56.082M
2015	92.114	1.950	0.472	47.236M
2005	59.859	1.661	0.491	36.048M
1990	42.675	1.824	0.504	23.402M

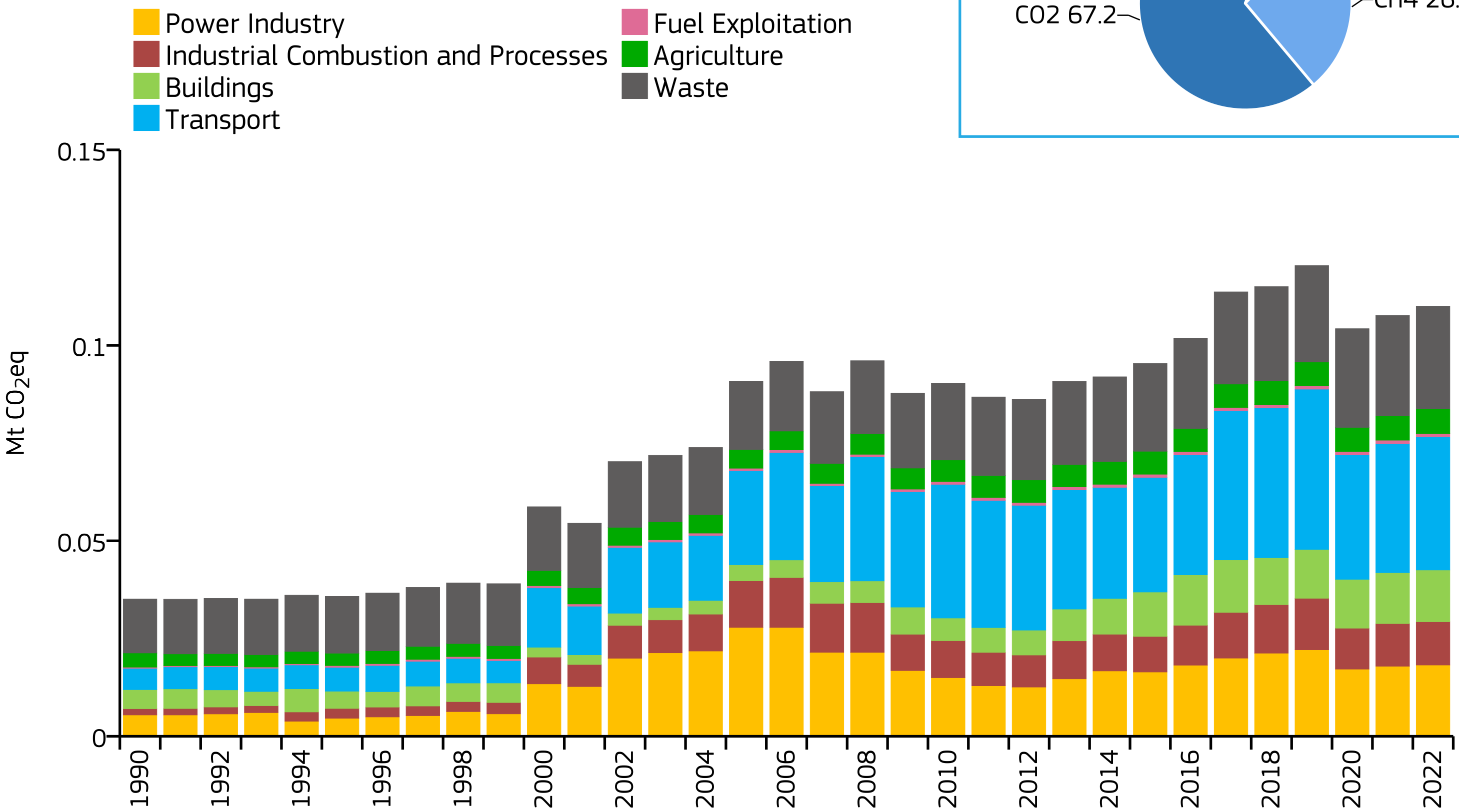
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	-42%	+2%
Industrial Combustion and Processes	+190%	+107%	+3%
Buildings	+124%	+53%	+1%
Transport	> +300%	> +300%	+2%
Fuel Exploitation	+115%	+43%	0%
Agriculture	+179%	+110%	+4%
Waste	+158%	+59%	+3%
All sectors	+176%	+97%	+3%

Kiribati

GHG % in 2022



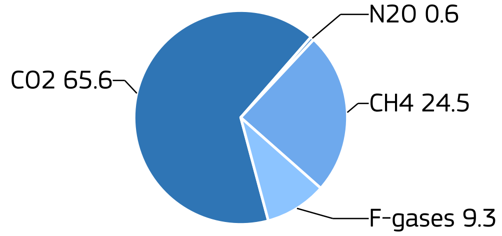
GHG emissions by sector



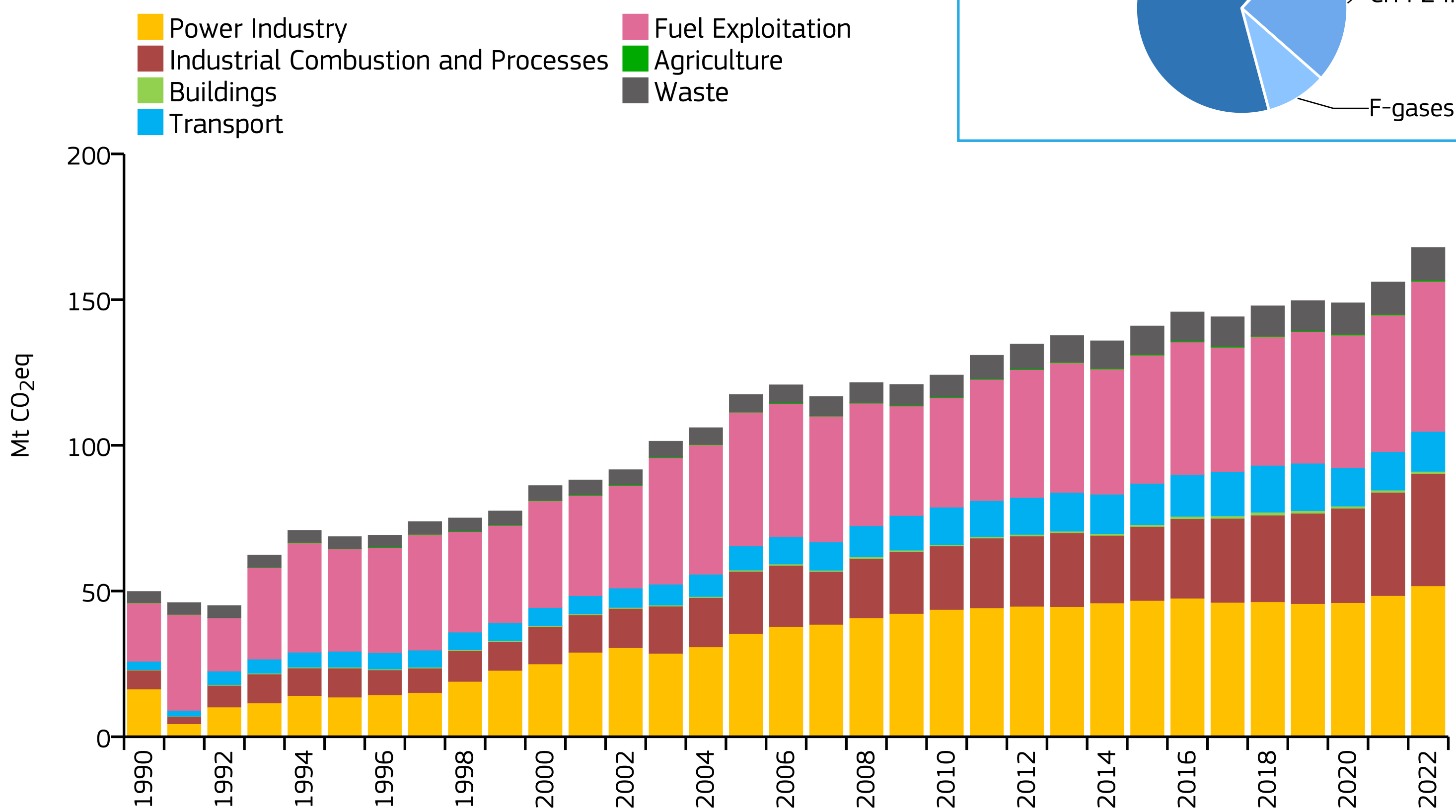
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.110	0.873	0.419	126.000k
2015	0.095	0.848	0.401	112.407k
2005	0.091	0.984	0.460	92.325k
1990	0.035	0.485	0.229	72.412k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+234%	-35%	+2%
Industrial Combustion and Processes	> +300%	-7%	+2%
Buildings	+172%	+222%	+2%
Transport	> +300%	+41%	+3%
Fuel Exploitation	+208%	+44%	0%
Agriculture	+73%	+31%	+1%
Waste	+90%	+50%	+2%
All sectors	+213%	+21%	+2%

Kuwait



GHG emissions by sector

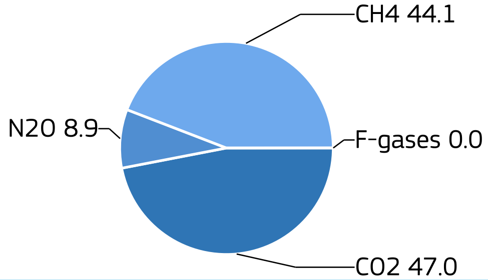


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	167.862	37.961	0.800	4.422M
2015	140.976	35.819	0.670	3.936M
2005	117.473	51.600	0.707	2.277M
1990	49.868	23.751	0.791	2.100M

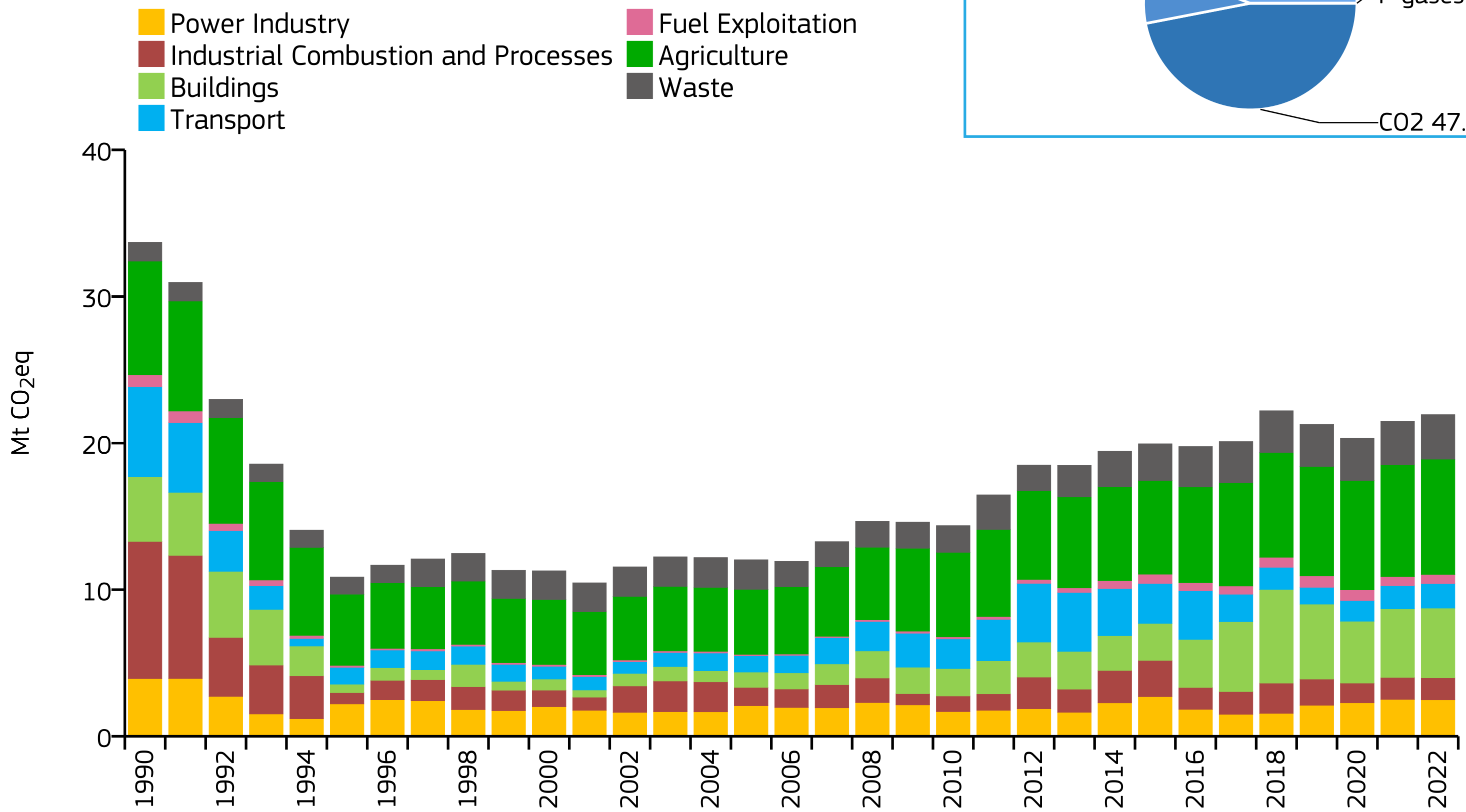
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+217%	+46%	+7%
Industrial Combustion and Processes	> +300%	+80%	+9%
Buildings	> +300%	+76%	+4%
Transport	> +300%	+65%	+4%
Fuel Exploitation	+156%	+12%	+10%
Agriculture	+194%	+78%	+3%
Waste	+200%	+90%	+2%
All sectors	+237%	+43%	+8%

Kyrgyzstan

GHG % in 2022



GHG emissions by sector

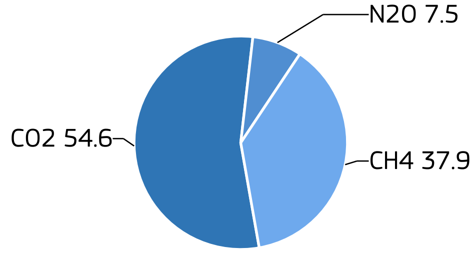


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	21.940	3.397	0.621	6.459M
2015	19.954	3.402	0.697	5.865M
2005	12.045	2.373	0.663	5.075M
1990	33.703	7.707	1.488	4.373M

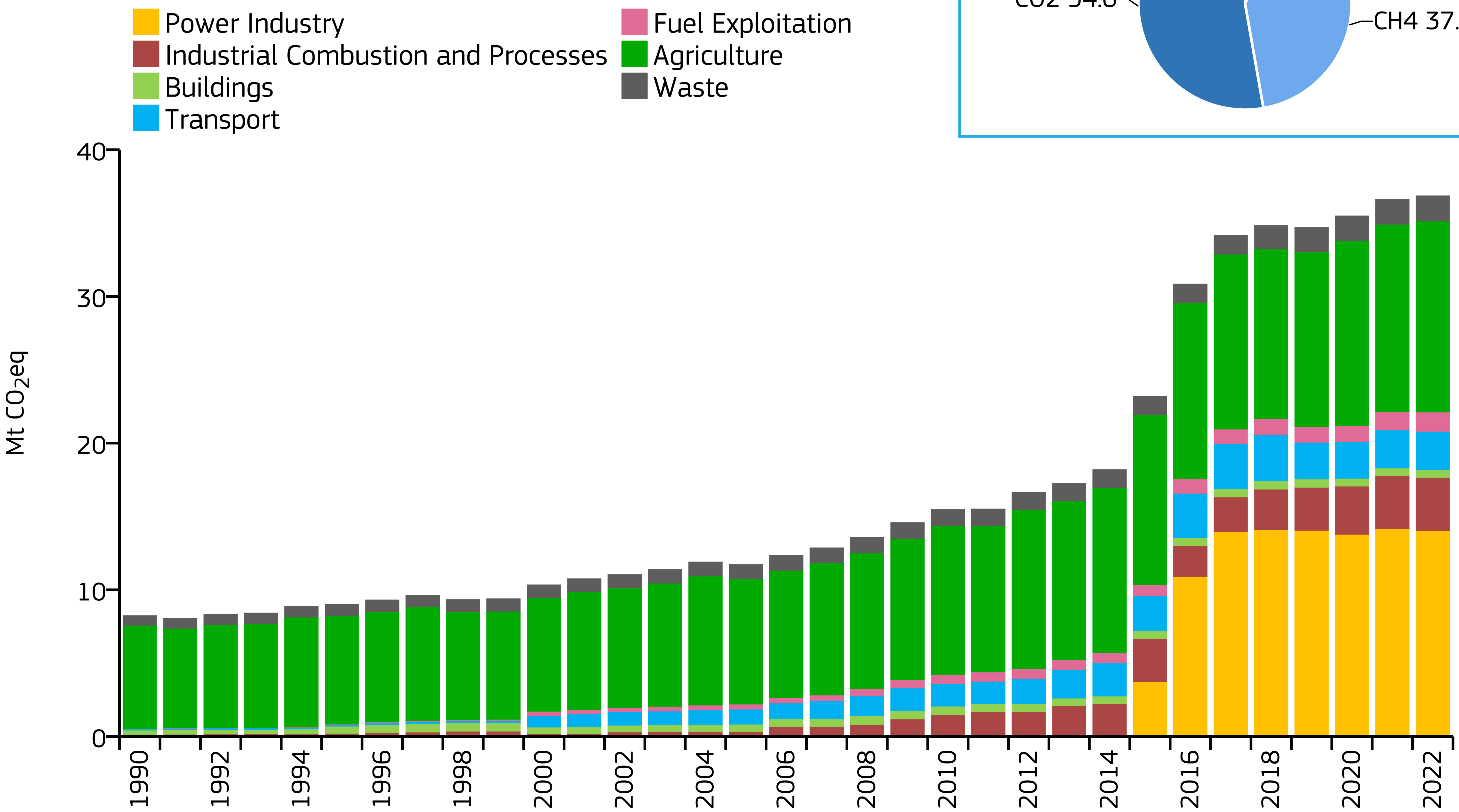
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-37%	+19%	-1%
Industrial Combustion and Processes	-84%	+20%	0%
Buildings	+8%	> +300%	+2%
Transport	-73%	+50%	+6%
Fuel Exploitation	-22%	> +300%	+2%
Agriculture	+1%	+77%	+3%
Waste	+134%	+50%	+3%
All sectors	-35%	+82%	+2%

Laos

GHG % in 2022



GHG emissions by sector

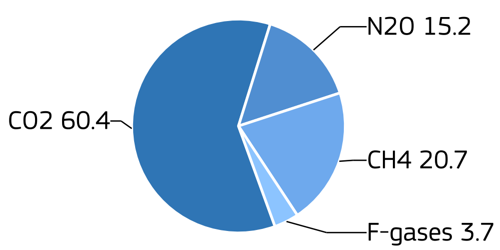


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	36.862	5.010	0.616	7.358M
2015	23.210	3.483	0.526	6.664M
2005	11.736	2.040	0.569	5.754M
1990	8.240	1.935	0.985	4.258M

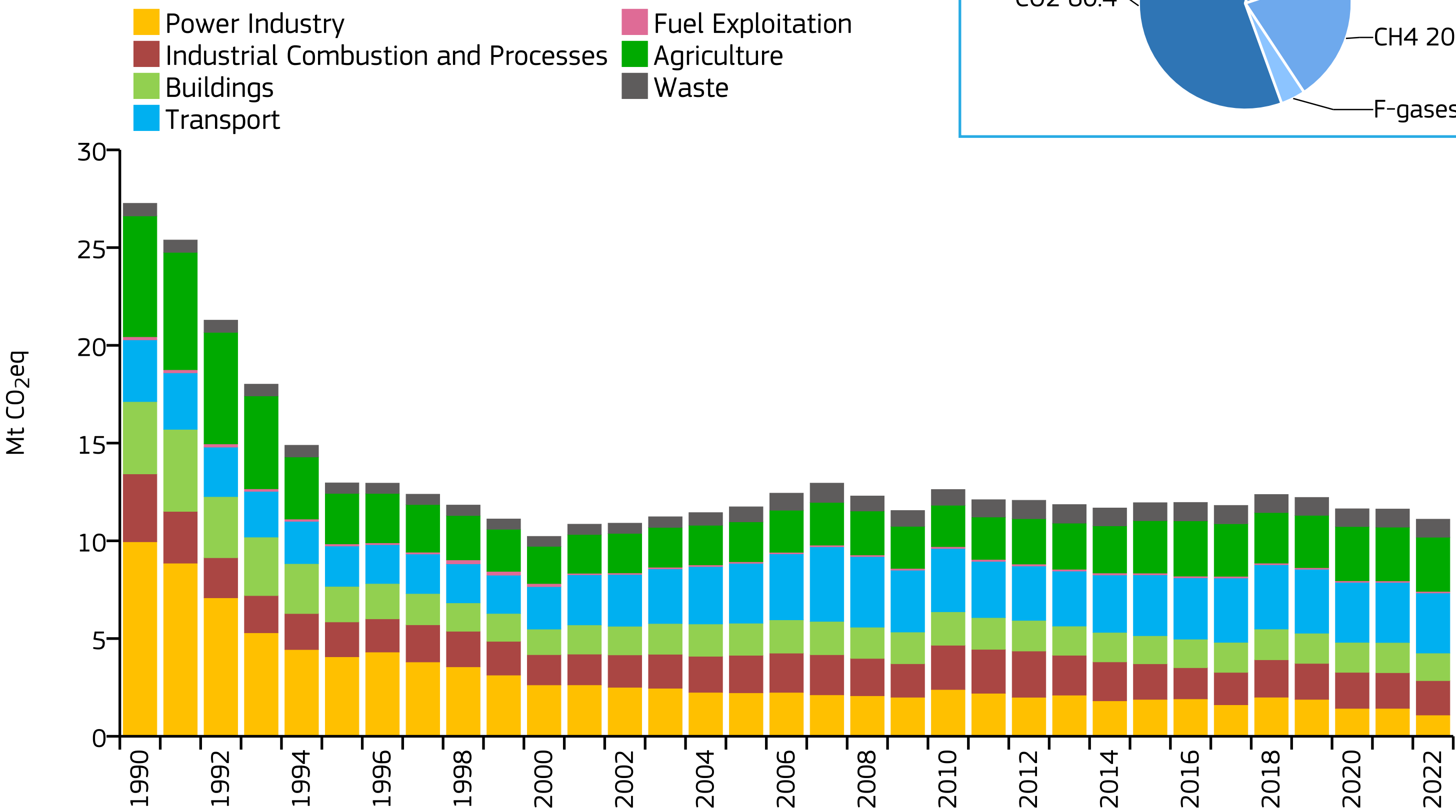
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	n/a	-1%
Industrial Combustion and Processes	> +300%	> +300%	0%
Buildings	+70%	+3%	0%
Transport	> +300%	+157%	+2%
Fuel Exploitation	> +300%	+282%	+4%
Agriculture	+85%	+52%	+2%
Waste	+161%	+75%	+1%
All sectors	> +300%	+214%	+1%

Latvia

GHG % in 2022



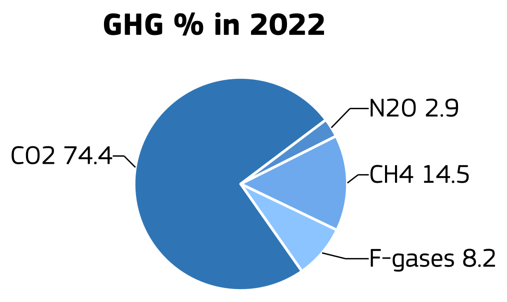
GHG emissions by sector



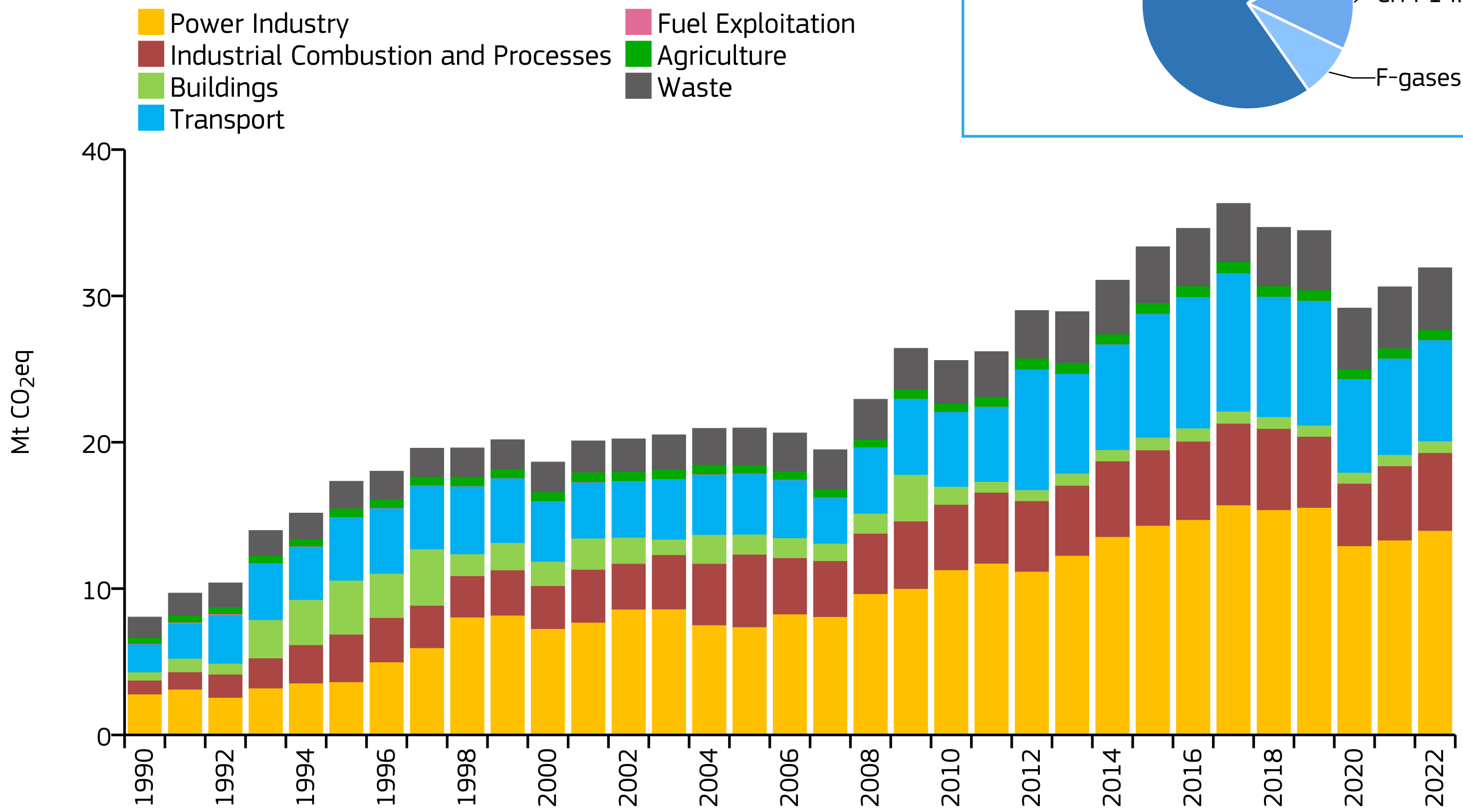
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	11.108	5.975	0.180	1.859M
2015	11.952	5.998	0.227	1.993M
2005	11.742	5.214	0.258	2.252M
1990	27.267	10.234	0.640	2.664M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-89%	-51%	-24%
Industrial Combustion and Processes	-49%	-8%	-4%
Buildings	-62%	-14%	-9%
Transport	-3%	0%	0%
Fuel Exploitation	-50%	-2%	+1%
Agriculture	-55%	+36%	+1%
Waste	+43%	+20%	-1%
All sectors	-59%	-5%	-4%

Lebanon



GHG emissions by sector

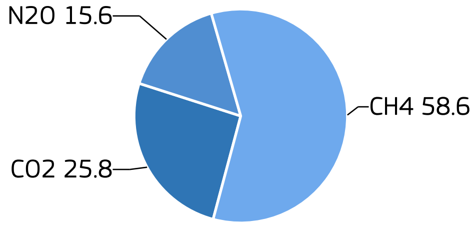


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	31.927	5.434	0.440	5.875M
2015	33.364	5.702	0.314	5.851M
2005	20.980	5.262	0.315	3.987M
1990	8.060	2.982	0.383	2.703M

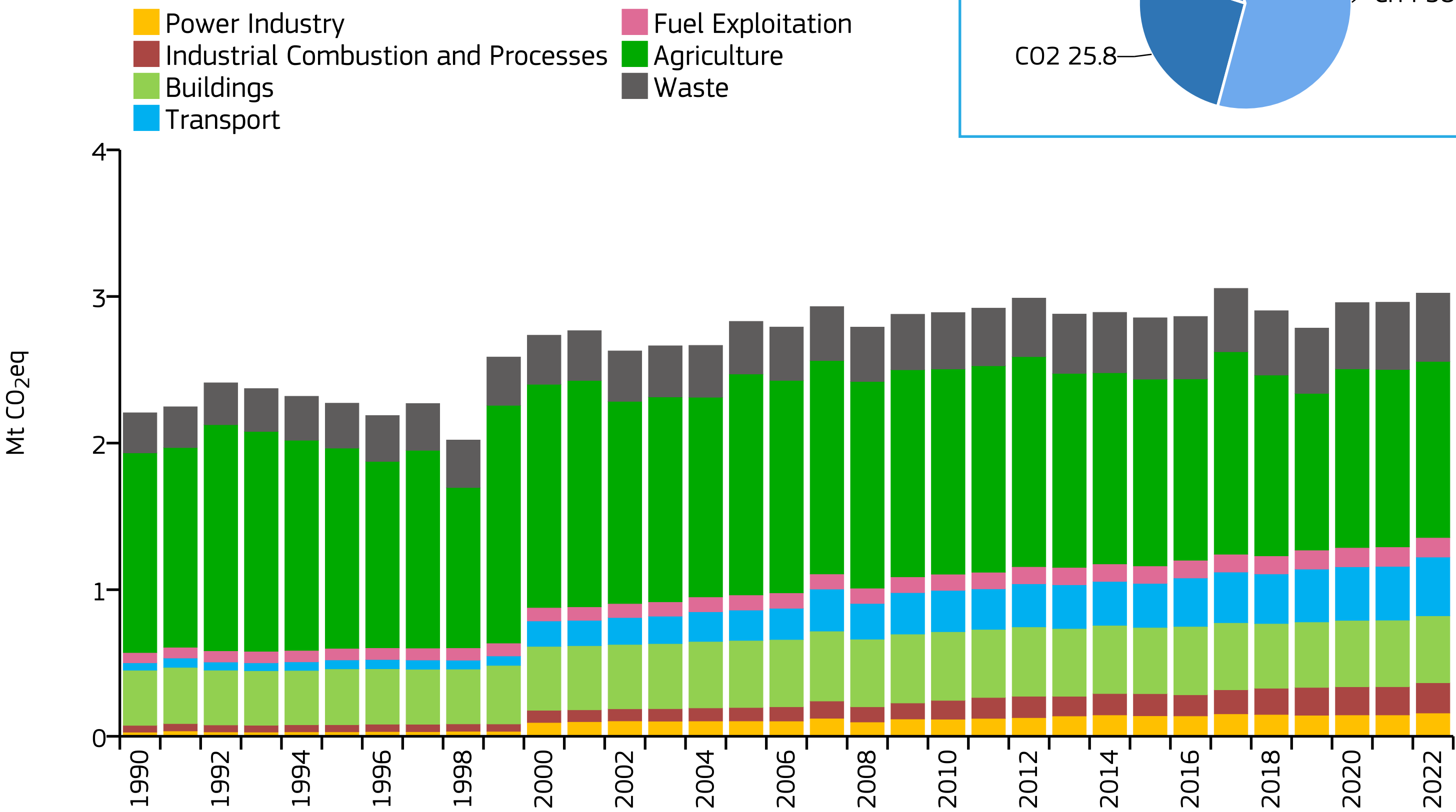
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+89%	+5%
Industrial Combustion and Processes	> +300%	+7%	+5%
Buildings	+42%	-41%	+5%
Transport	+263%	+67%	+5%
Fuel Exploitation	-64%	-58%	0%
Agriculture	+69%	+25%	0%
Waste	+200%	+66%	+1%
All sectors	+296%	+52%	+4%

Lesotho

GHG % in 2022



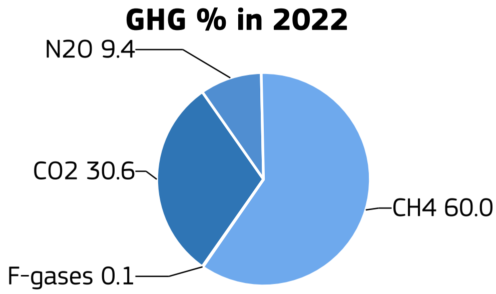
GHG emissions by sector



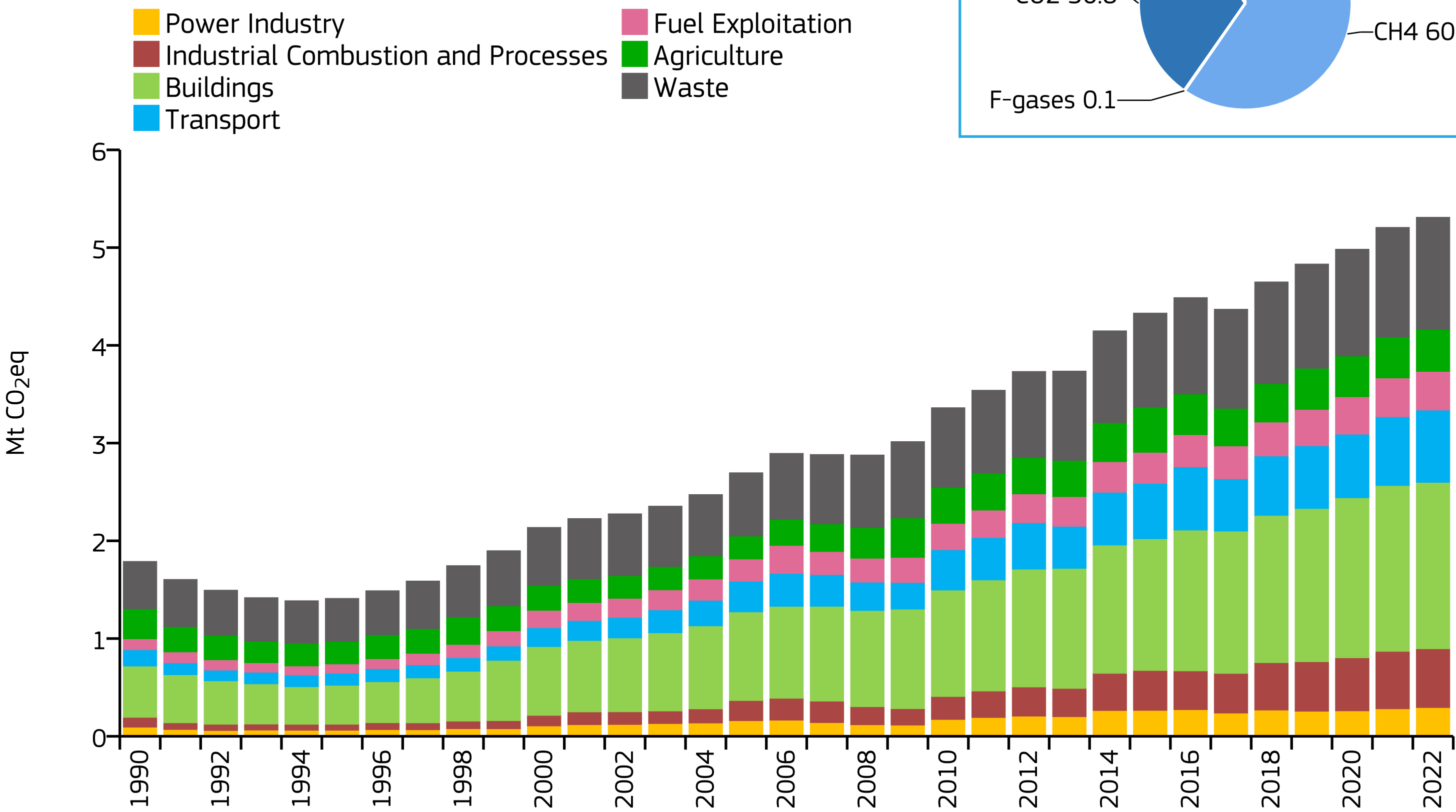
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3.023	1.270	0.575	2.381M
2015	2.855	1.313	0.513	2.175M
2005	2.830	1.452	0.720	1.950M
1990	2.207	1.376	0.969	1.604M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+52%	+9%
Industrial Combustion and Processes	> +300%	+125%	+7%
Buildings	+21%	0%	+1%
Transport	> +300%	+94%	+9%
Fuel Exploitation	+90%	+29%	0%
Agriculture	-12%	-20%	-1%
Waste	+70%	+30%	+1%
All sectors	+37%	+7%	+2%

Liberia



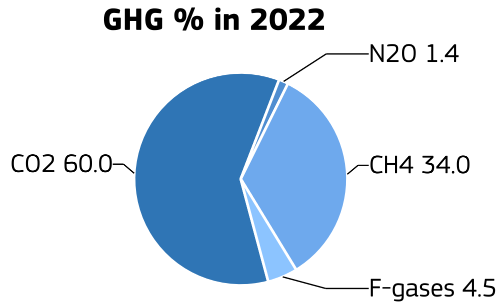
GHG emissions by sector



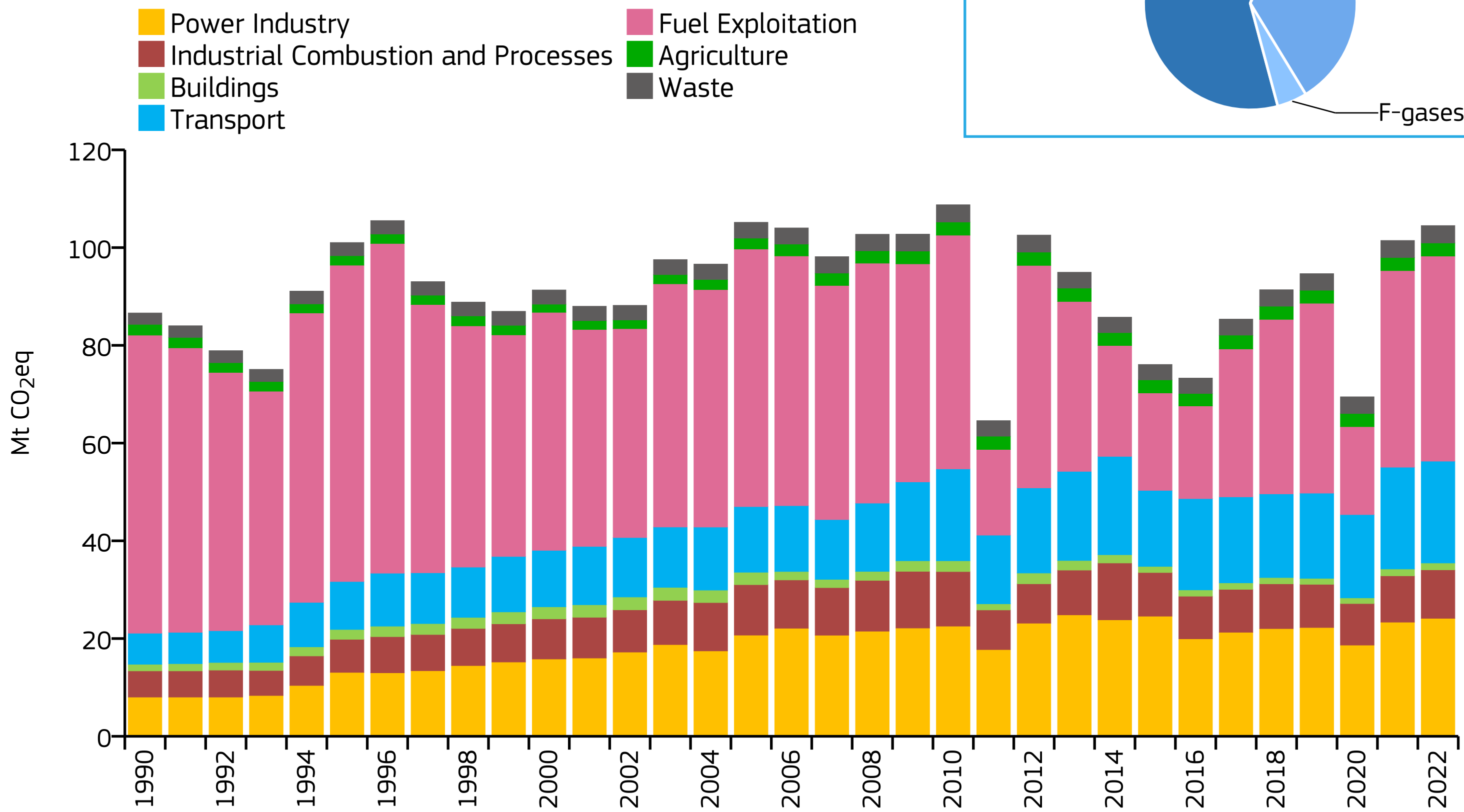
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	5.311	0.990	0.686	5.363M
2015	4.331	0.963	0.594	4.500M
2005	2.697	0.827	0.670	3.261M
1990	1.790	0.854	0.536	2.097M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+216%	+85%	+5%
Industrial Combustion and Processes	> +300%	+192%	+2%
Buildings	+224%	+88%	0%
Transport	> +300%	+135%	+5%
Fuel Exploitation	+253%	+74%	0%
Agriculture	+39%	+82%	+2%
Waste	+136%	+77%	+2%
All sectors	+197%	+97%	+2%

Libya



GHG emissions by sector

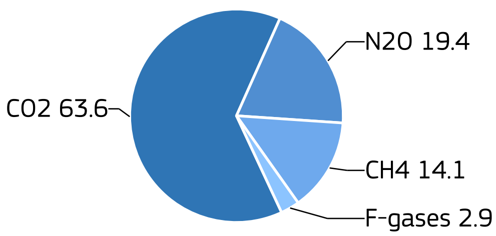


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	104.514	15.318	0.775	6.823M
2015	76.094	12.204	0.643	6.235M
2005	105.180	18.157	0.585	5.793M
1990	86.632	19.526	0.627	4.437M

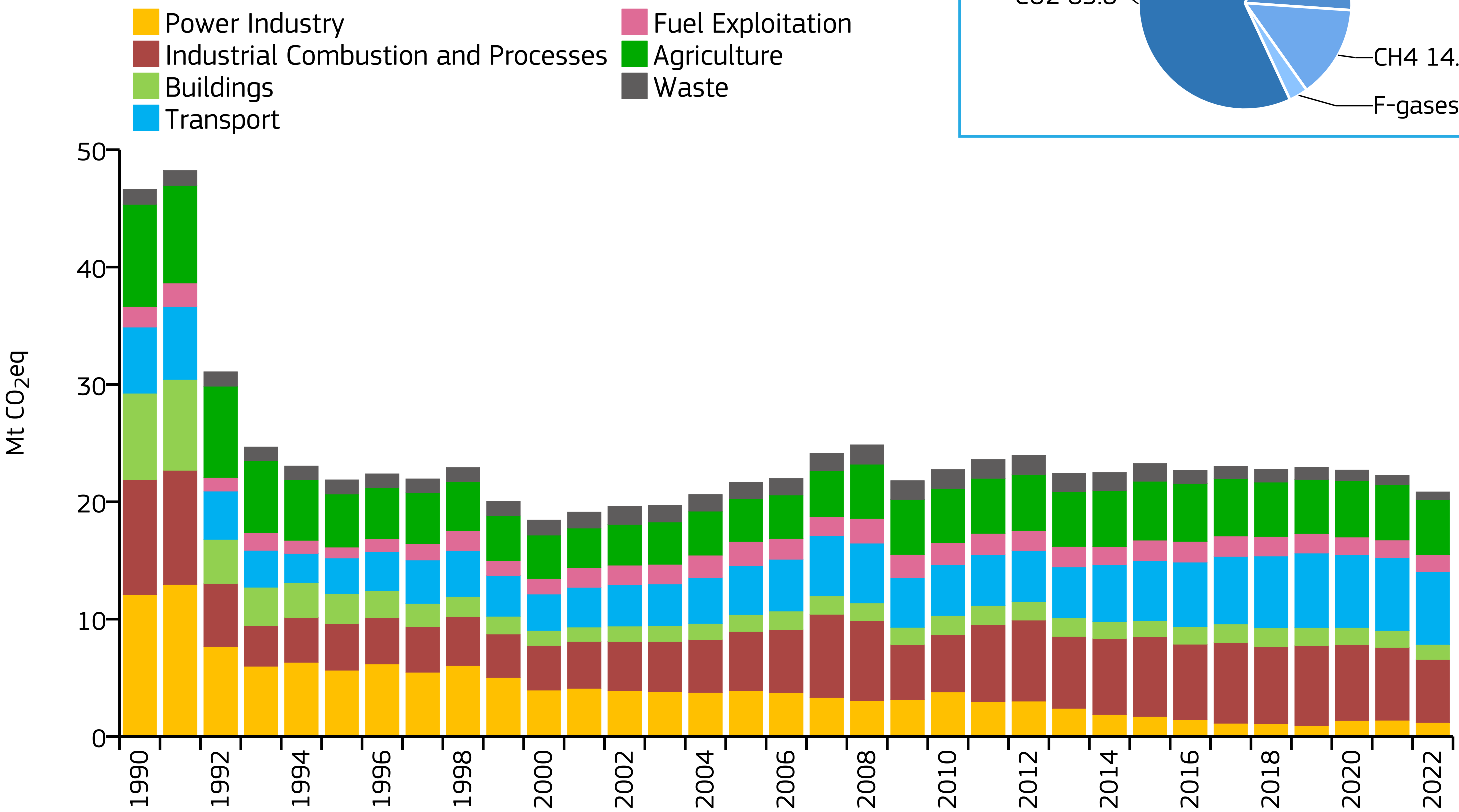
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+201%	+17%	+3%
Industrial Combustion and Processes	+85%	-4%	+5%
Buildings	+2%	-45%	0%
Transport	+228%	+55%	0%
Fuel Exploitation	-31%	-20%	+4%
Agriculture	+22%	+22%	0%
Waste	+52%	+10%	+2%
All sectors	+21%	-1%	+3%

Lithuania

GHG % in 2022



GHG emissions by sector

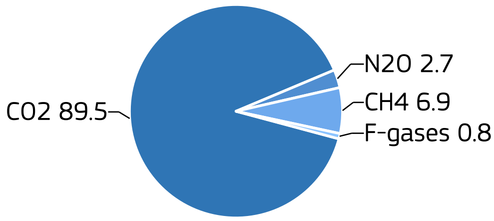


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	20.847	7.372	0.186	2.828M
2015	23.274	7.938	0.261	2.932M
2005	21.676	6.482	0.310	3.344M
1990	46.631	12.617	0.752	3.696M

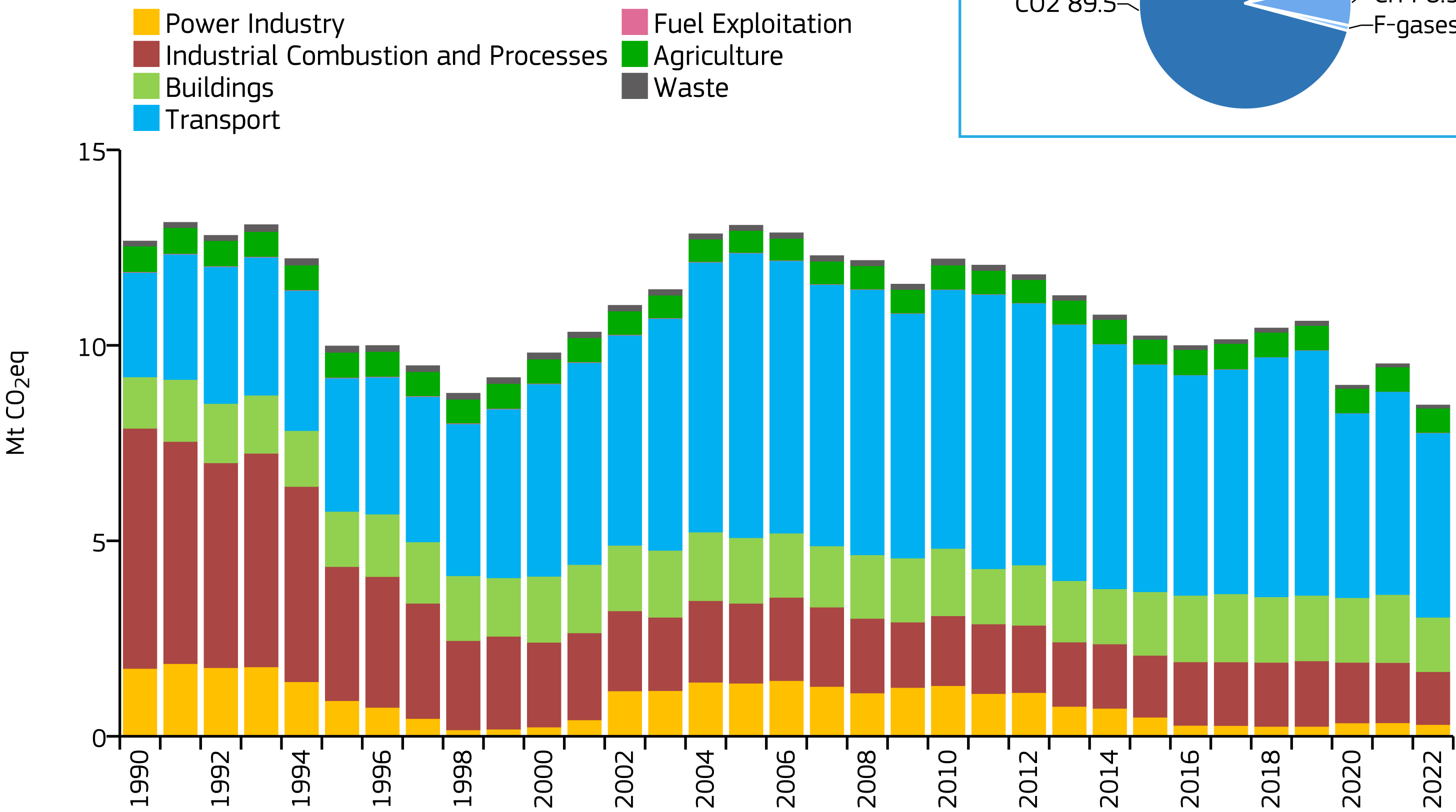
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-90%	-70%	-14%
Industrial Combustion and Processes	-45%	+6%	-13%
Buildings	-82%	-11%	-11%
Transport	+10%	+49%	0%
Fuel Exploitation	-17%	-29%	-3%
Agriculture	-46%	+29%	0%
Waste	-47%	-52%	-15%
All sectors	-55%	-4%	-6%

Luxembourg

GHG % in 2022



GHG emissions by sector

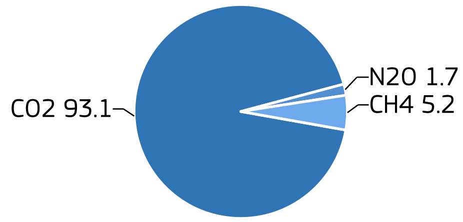


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	8.476	13.692	0.113	619.000k
2015	10.243	18.073	0.159	566.741k
2005	13.072	28.552	0.259	457.842k
1990	12.670	33.185	0.468	381.791k

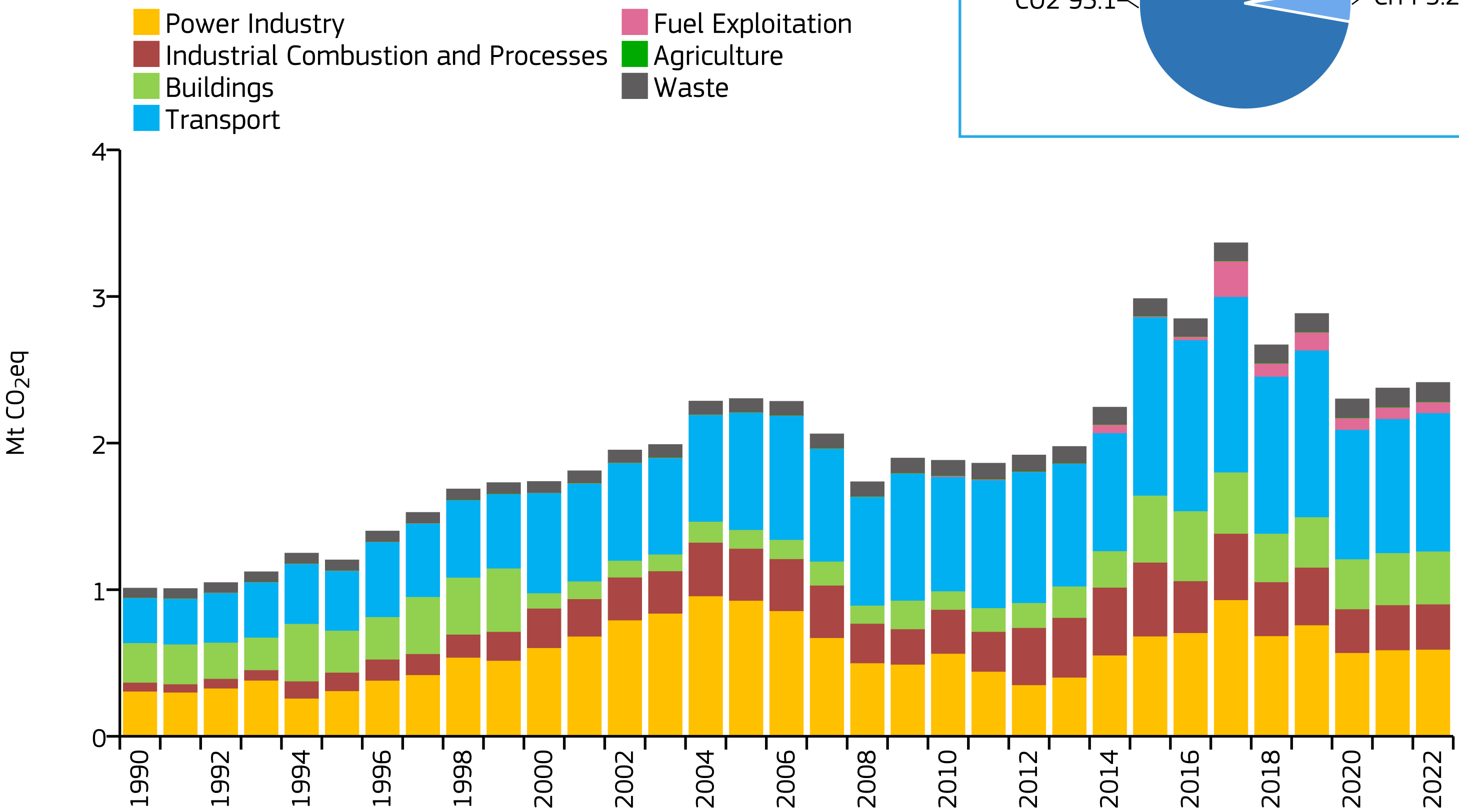
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-83%	-78%	-13%
Industrial Combustion and Processes	-78%	-34%	-12%
Buildings	+6%	-17%	-20%
Transport	+77%	-35%	-9%
Fuel Exploitation	-66%	-57%	0%
Agriculture	-5%	+10%	0%
Waste	-35%	-37%	-1%
All sectors	-33%	-35%	-11%

Macao

GHG % in 2022



GHG emissions by sector

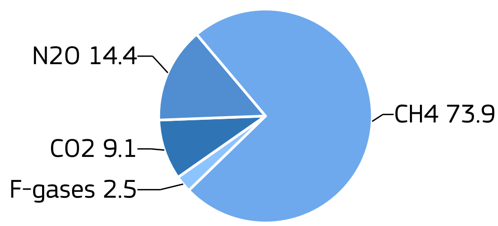


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.414	3.592	0.074	672.000k
2015	2.986	4.969	0.042	600.942k
2005	2.304	4.774	0.062	482.559k
1990	1.011	2.939	0.060	343.935k

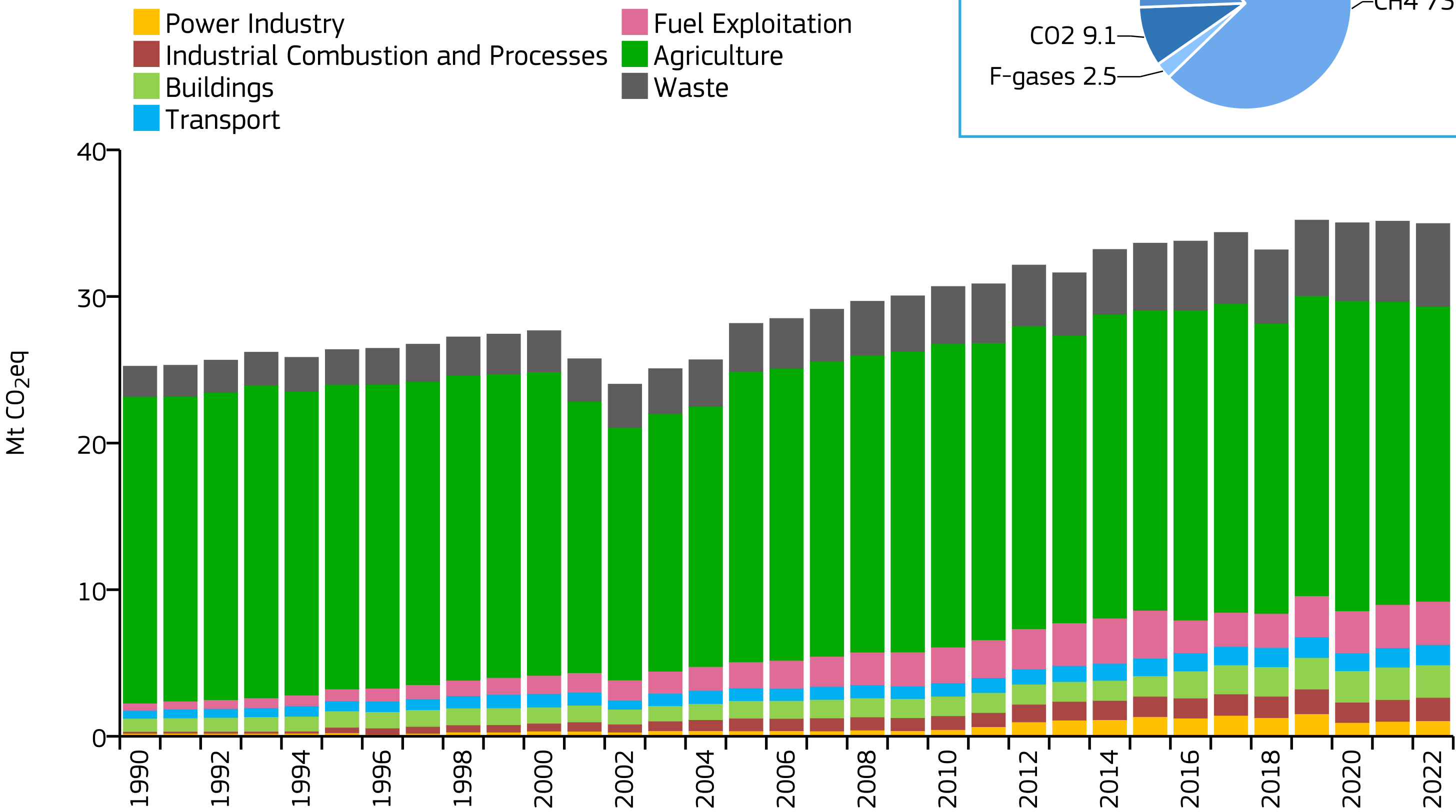
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+93%	-36%	+1%
Industrial Combustion and Processes	> +300%	-13%	+1%
Buildings	+34%	+181%	+2%
Transport	+208%	+18%	+3%
Fuel Exploitation	> +300%	> +300%	-5%
Agriculture	+70%	+11%	+1%
Waste	+107%	+44%	+1%
All sectors	+139%	+5%	+2%

Madagascar

GHG % in 2022



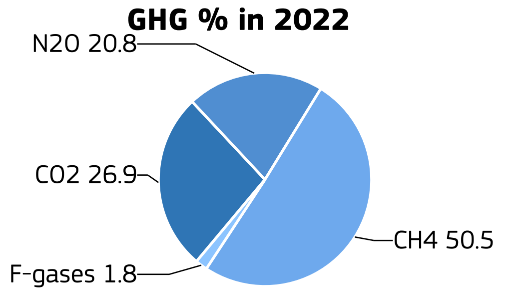
GHG emissions by sector



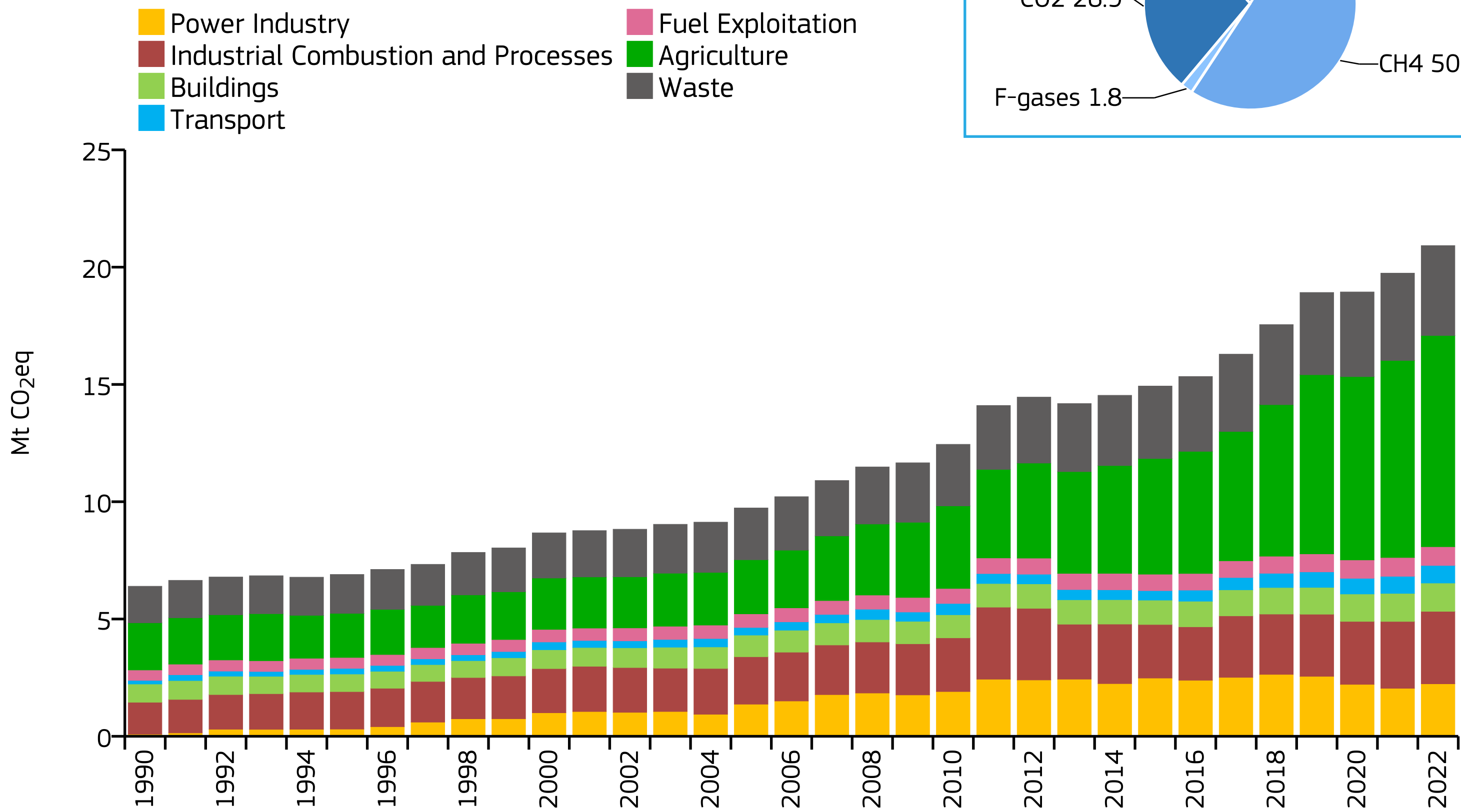
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	34.980	1.199	0.786	29.176M
2015	33.643	1.388	0.898	24.234M
2005	28.168	1.536	0.985	18.337M
1990	25.245	2.177	1.175	11.599M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+190%	+4%
Industrial Combustion and Processes	> +300%	+83%	+7%
Buildings	+148%	+86%	0%
Transport	+156%	+61%	+5%
Fuel Exploitation	> +300%	+65%	0%
Agriculture	-4%	+2%	-3%
Waste	+172%	+71%	+3%
All sectors	+39%	+24%	0%

Malawi



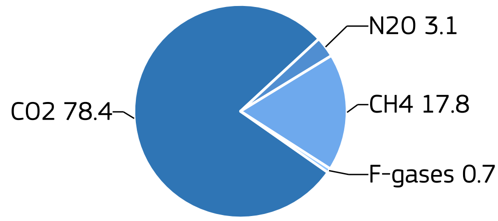
GHG emissions by sector



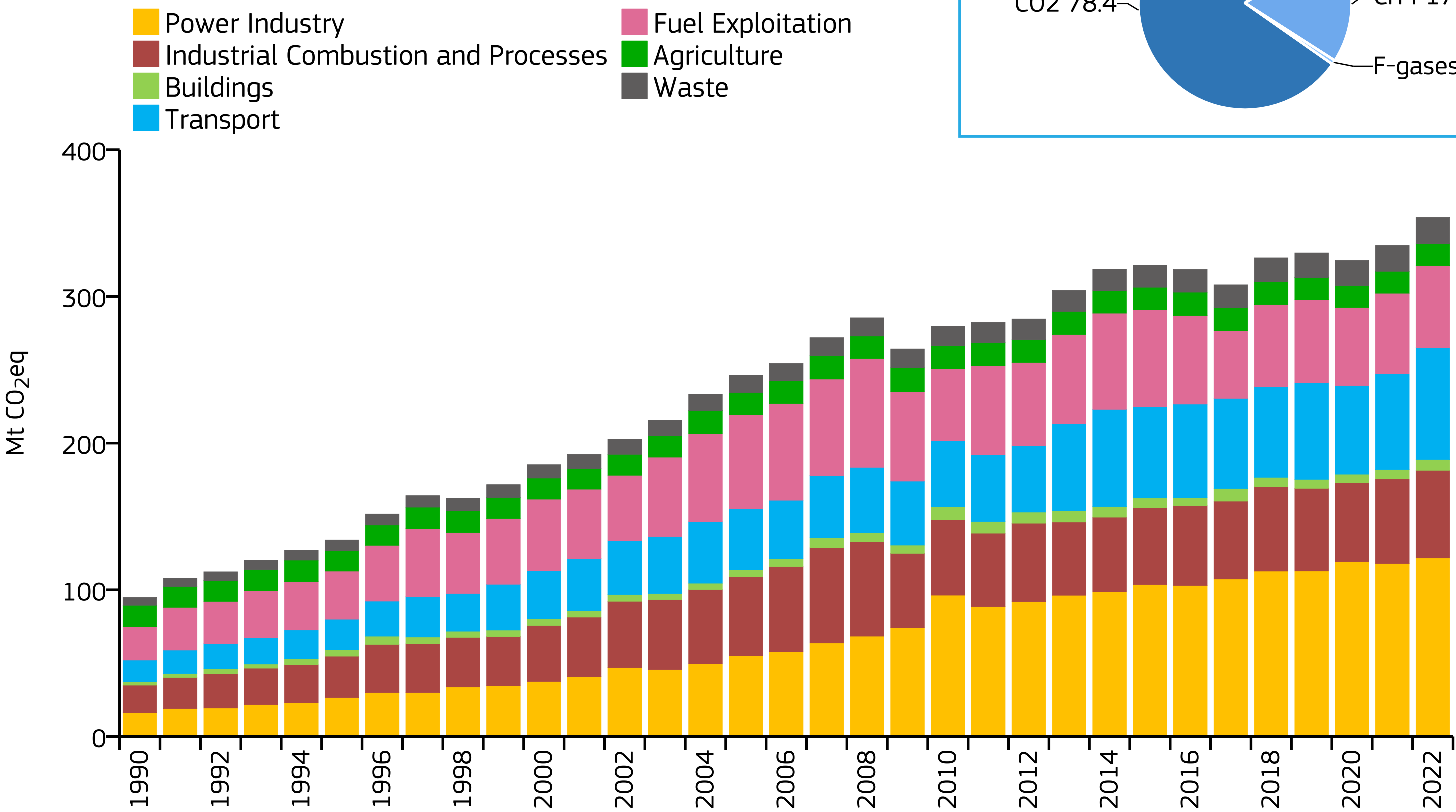
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	20.919	0.975	0.699	21.446M
2015	14.932	0.850	0.612	17.574M
2005	9.736	0.747	0.698	13.040M
1990	6.397	0.678	0.716	9.438M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+63%	+9%
Industrial Combustion and Processes	+127%	+53%	+8%
Buildings	+55%	+31%	+1%
Transport	> +300%	+131%	+3%
Fuel Exploitation	+80%	+38%	0%
Agriculture	> +300%	+290%	+7%
Waste	+146%	+74%	+3%
All sectors	+227%	+115%	+6%

Malaysia



GHG emissions by sector

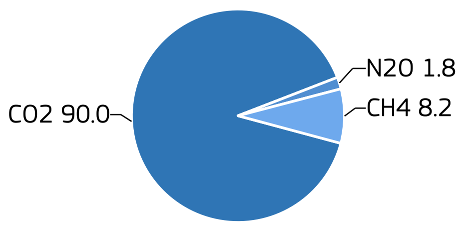


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	353.917	10.499	0.368	33.711M
2015	321.309	10.458	0.428	30.723M
2005	246.078	9.590	0.529	25.659M
1990	94.791	5.255	0.510	18.038M

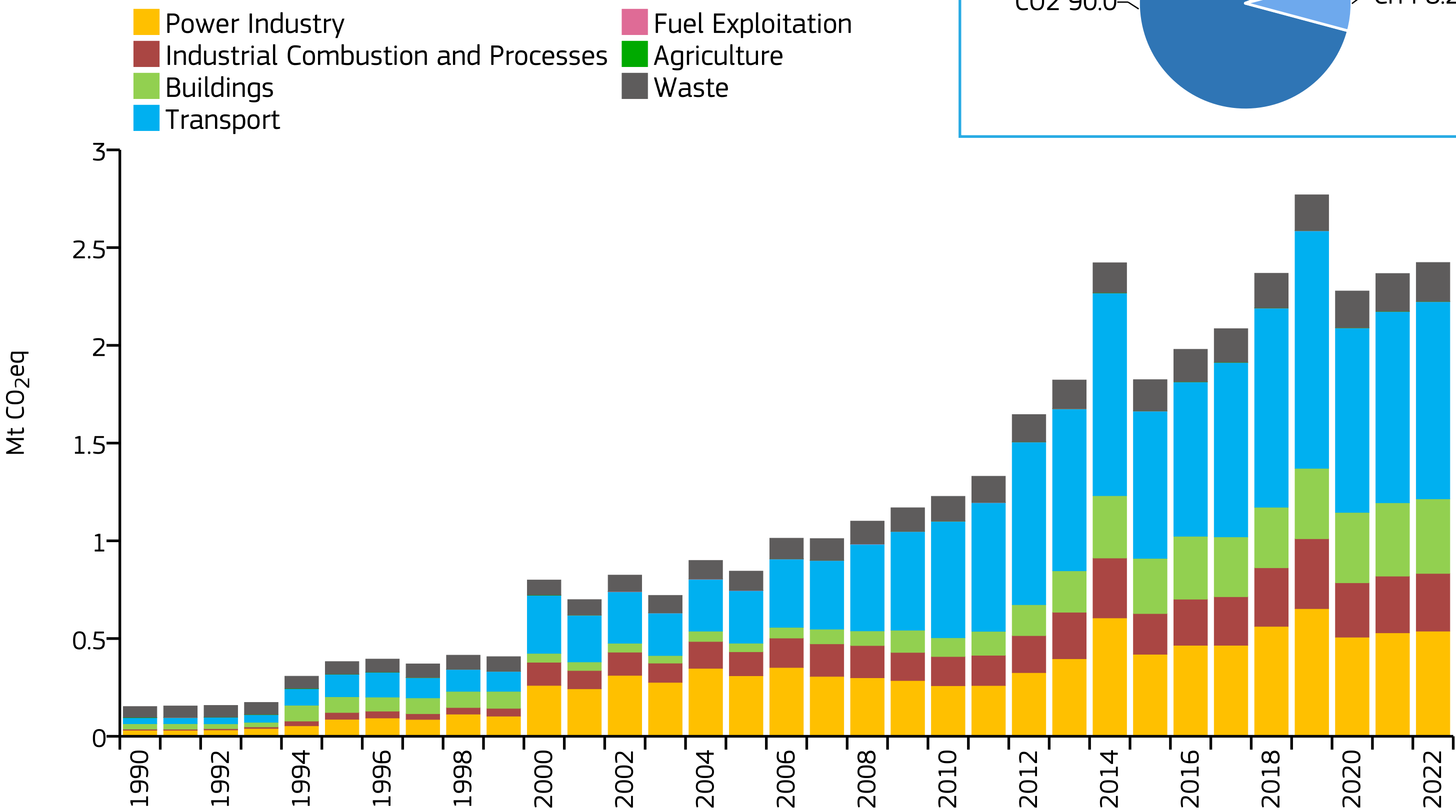
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+122%	+3%
Industrial Combustion and Processes	+217%	+11%	+4%
Buildings	+236%	+58%	+17%
Transport	> +300%	+83%	+17%
Fuel Exploitation	+146%	-13%	+1%
Agriculture	+2%	-2%	0%
Waste	+236%	+56%	+2%
All sectors	+273%	+44%	+6%

Maldives

GHG % in 2022



GHG emissions by sector

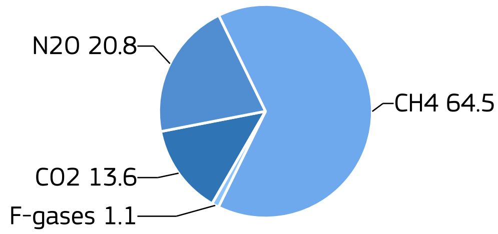


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.424	5.136	0.221	472.000k
2015	1.825	4.361	0.232	418.403k
2005	0.845	2.651	0.210	318.836k
1990	0.152	0.683	0.064	223.215k

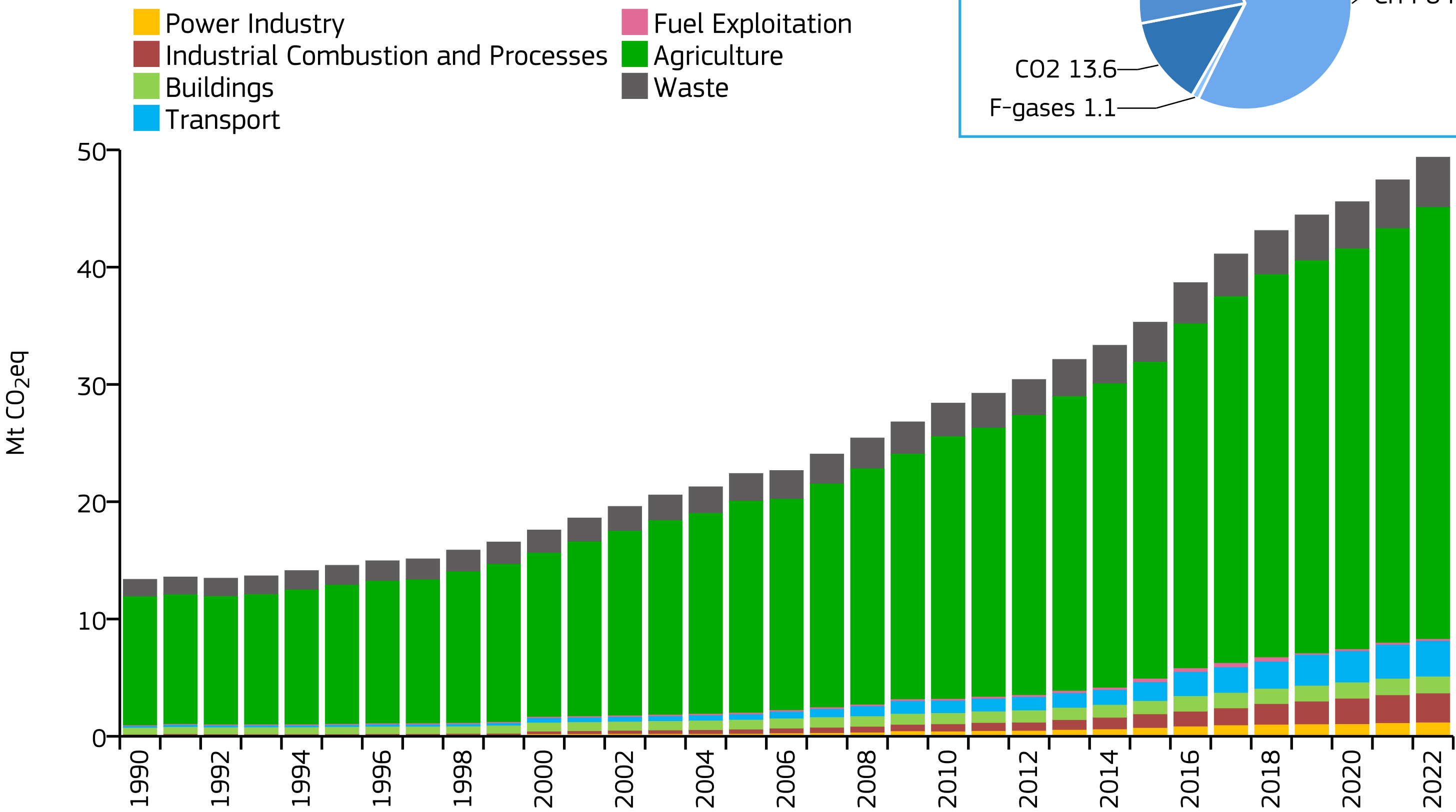
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+74%	+2%
Industrial Combustion and Processes	> +300%	+140%	+2%
Buildings	> +300%	> +300%	+2%
Transport	> +300%	+275%	+3%
Fuel Exploitation	+207%	+37%	0%
Agriculture	-63%	+8%	+1%
Waste	+253%	+102%	+3%
All sectors	> +300%	+187%	+2%

Mali

GHG % in 2022



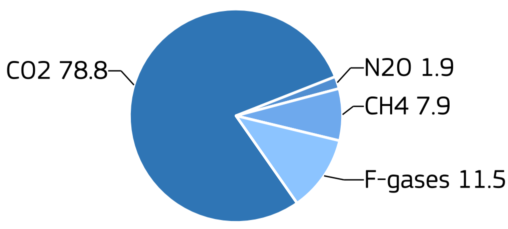
GHG emissions by sector



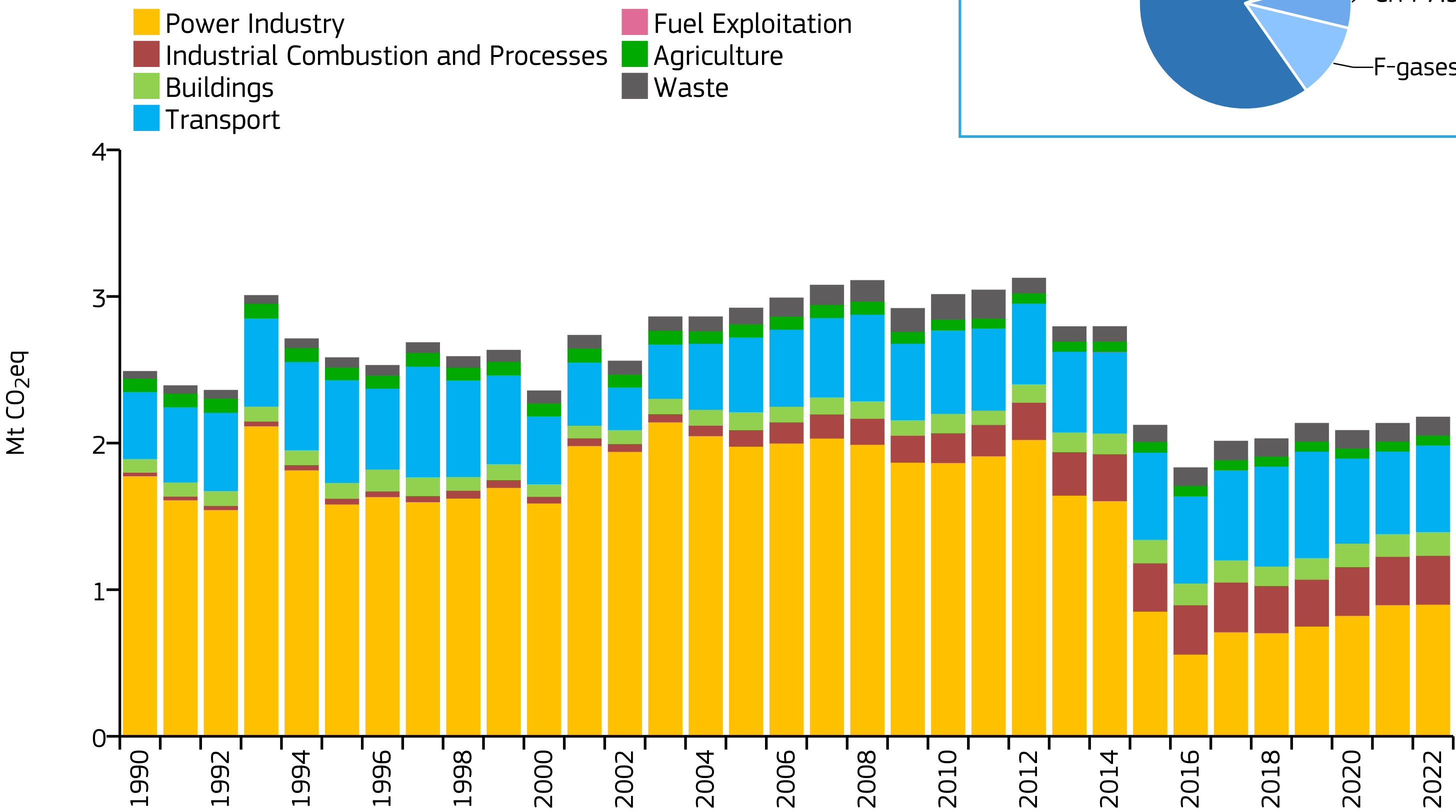
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	49.383	2.295	1.025	21.515M
2015	35.311	2.021	0.946	17.468M
2005	22.415	1.751	0.896	12.799M
1990	13.389	1.582	1.120	8.465M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	+5%
Industrial Combustion and Processes	> +300%	> +300%	+4%
Buildings	+150%	+74%	+2%
Transport	> +300%	> +300%	+5%
Fuel Exploitation	+127%	+26%	0%
Agriculture	+235%	+104%	+4%
Waste	+196%	+84%	+3%
All sectors	+269%	+120%	+4%

Malta



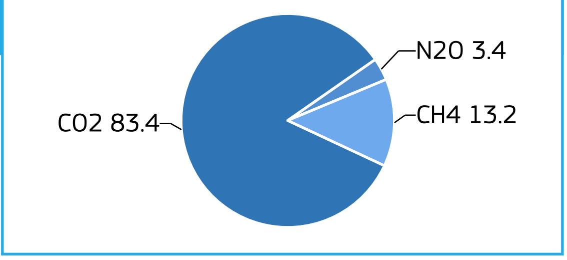
GHG emissions by sector



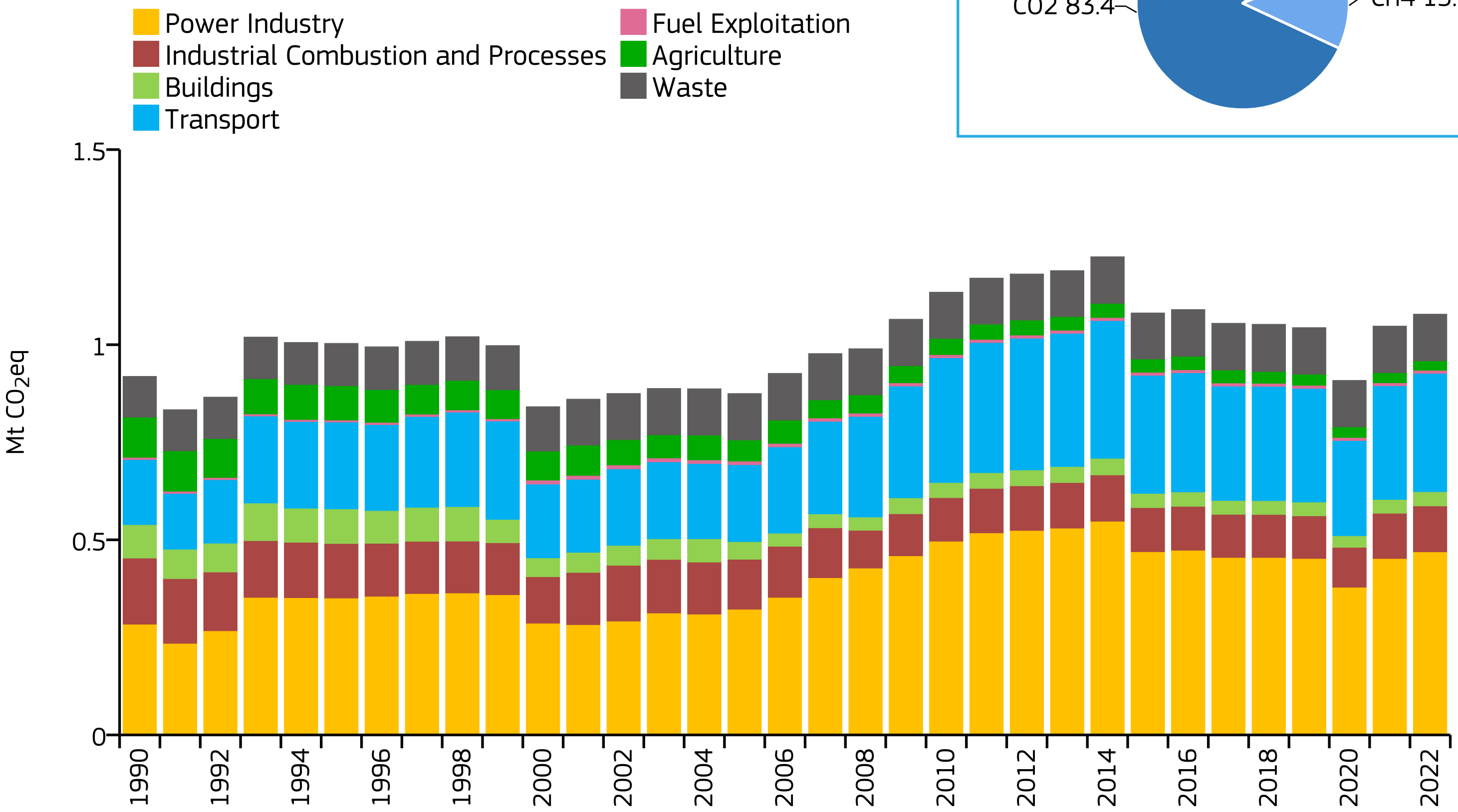
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.178	4.996	0.086	436.000k
2015	2.122	4.963	0.120	427.616k
2005	2.922	7.183	0.249	406.787k
1990	2.490	6.832	0.436	364.431k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-49%	-55%	0%
Industrial Combustion and Processes	> +300%	+198%	+1%
Buildings	+74%	+32%	+4%
Transport	+29%	+16%	+5%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	-24%	-24%	0%
Waste	+156%	+13%	+1%
All sectors	-13%	-25%	+2%

Martinique



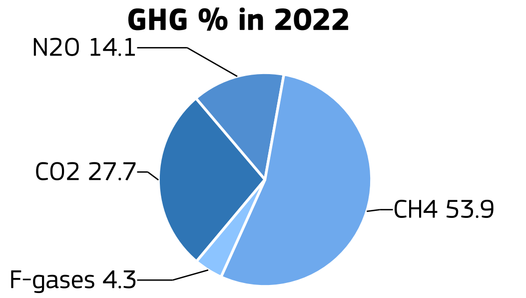
GHG emissions by sector



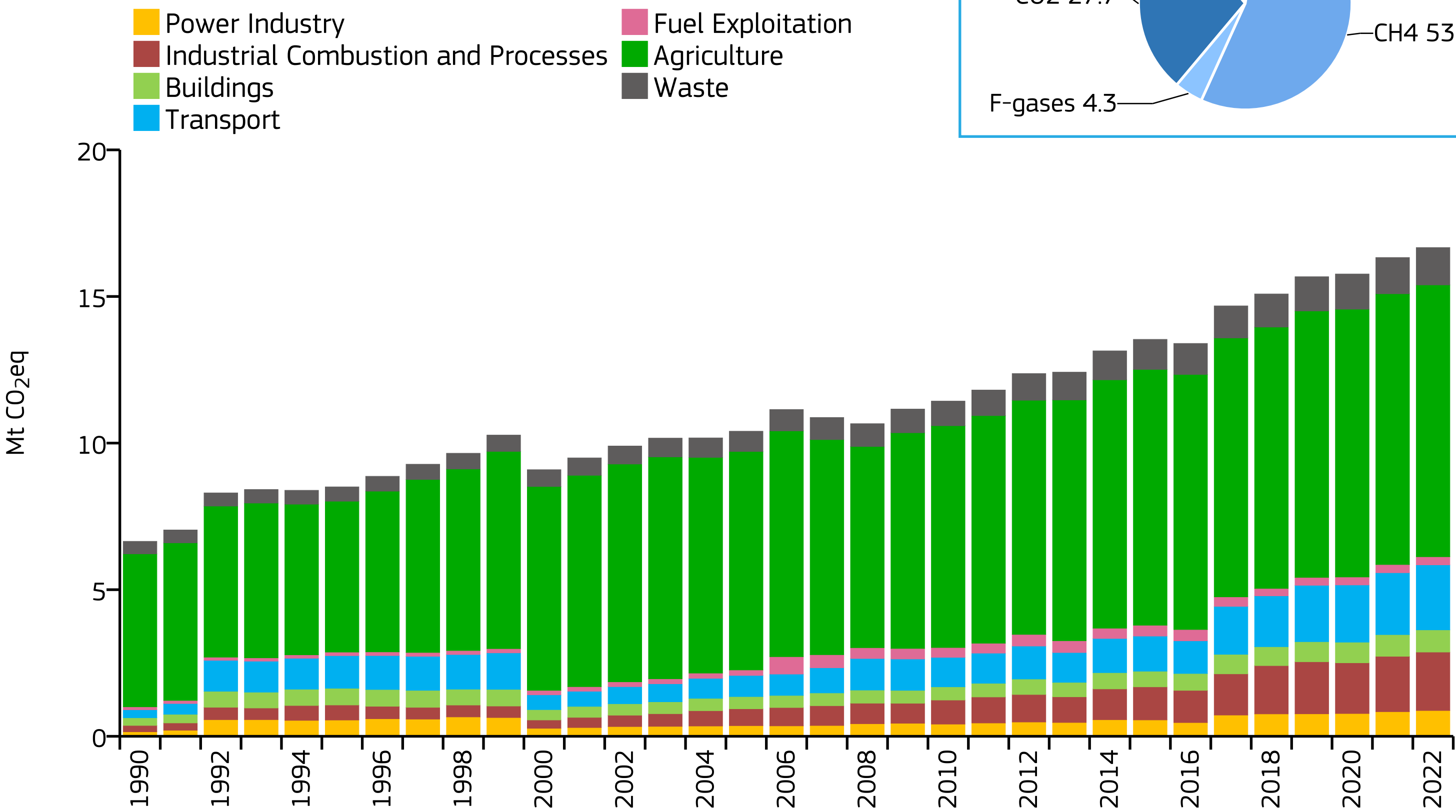
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.078	2.801	n/a	385.000k
2015	1.082	2.803	n/a	385.842k
2005	0.875	2.204	n/a	397.047k
1990	0.919	2.564	n/a	358.449k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+65%	+46%	+4%
Industrial Combustion and Processes	-31%	-8%	+1%
Buildings	-57%	-19%	+4%
Transport	+82%	+54%	+4%
Fuel Exploitation	+34%	-14%	0%
Agriculture	-76%	-55%	-5%
Waste	+14%	0%	0%
All sectors	+17%	+23%	+3%

Mauritania



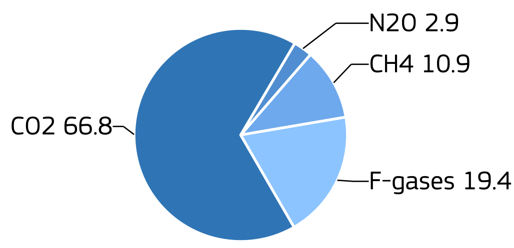
GHG emissions by sector



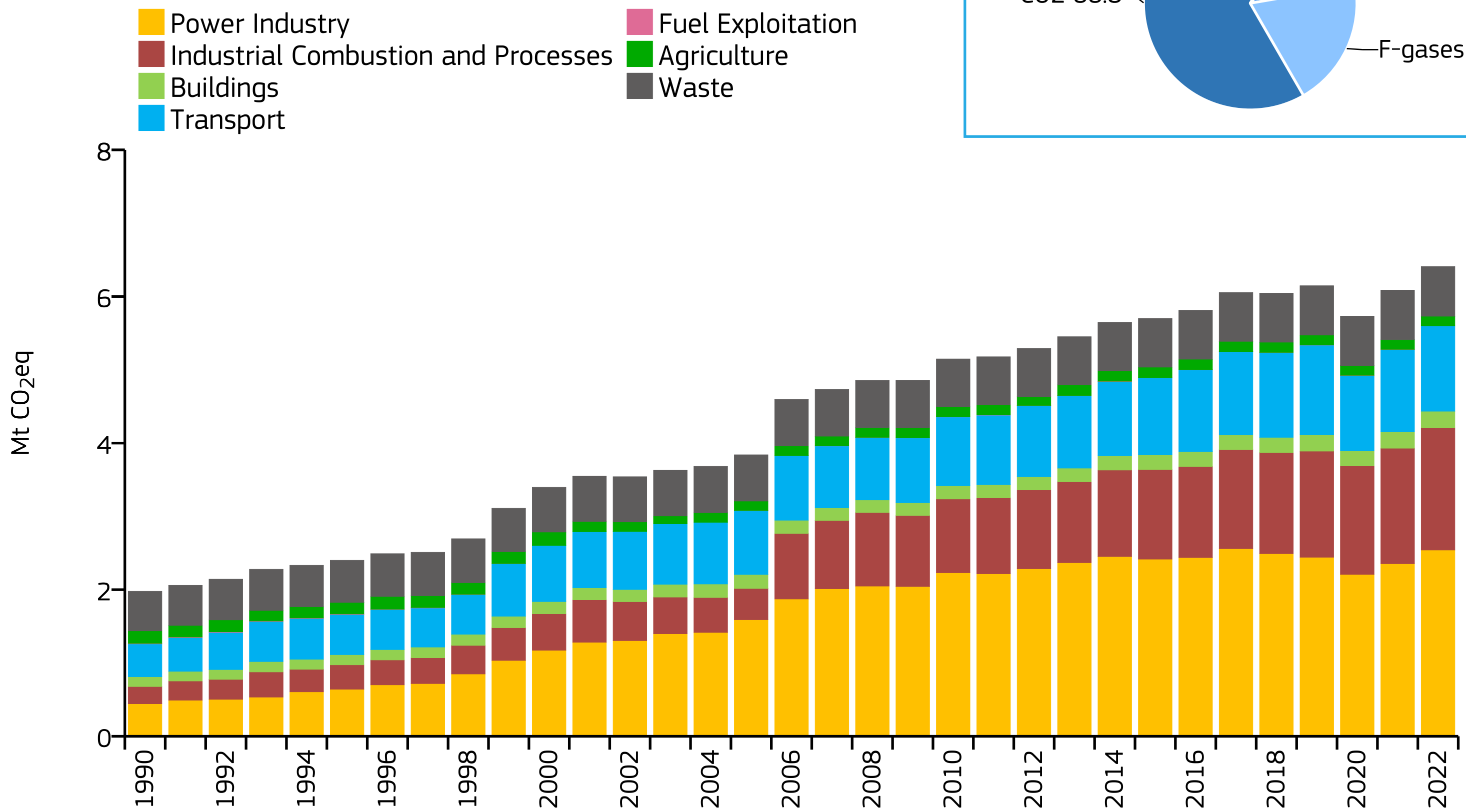
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	16.670	3.312	0.647	5.033M
2015	13.538	3.237	0.666	4.182M
2005	10.404	3.323	0.757	3.131M
1990	6.650	3.276	0.719	2.030M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+142%	+5%
Industrial Combustion and Processes	> +300%	+247%	+6%
Buildings	+188%	+82%	+2%
Transport	> +300%	+208%	+5%
Fuel Exploitation	+180%	+48%	0%
Agriculture	+78%	+24%	0%
Waste	+198%	+84%	+3%
All sectors	+151%	+60%	+2%

Mauritius



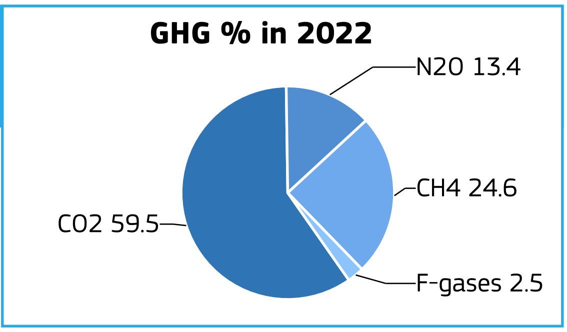
GHG emissions by sector



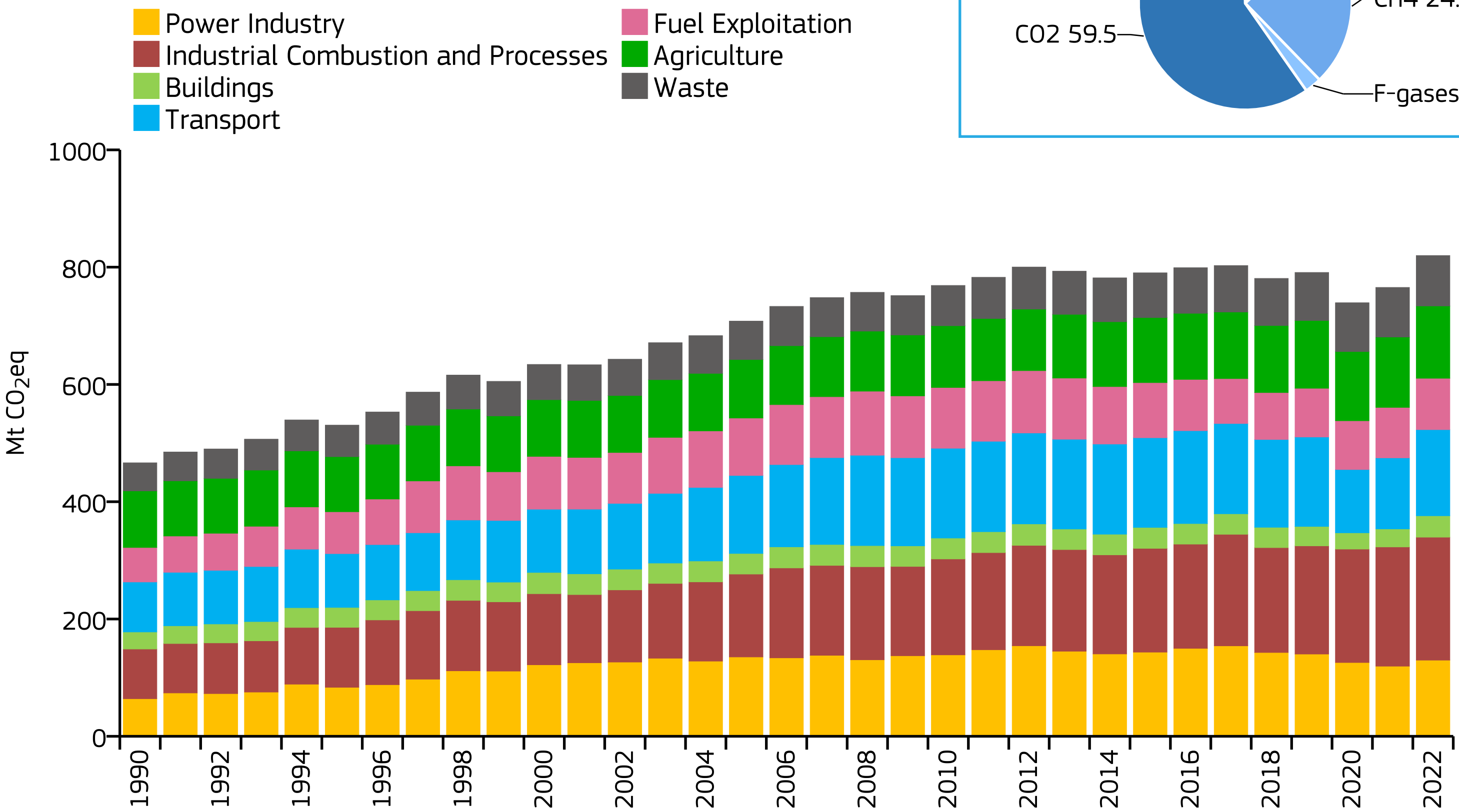
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	6.409	5.011	0.223	1.279M
2015	5.699	4.525	0.220	1.259M
2005	3.840	3.143	0.224	1.222M
1990	1.978	1.873	0.227	1.056M

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+60%	+8%
Industrial Combustion and Processes	> +300%	+291%	+6%
Buildings	+71%	+19%	+2%
Transport	+160%	+34%	+3%
Fuel Exploitation	-87%	-62%	0%
Agriculture	-22%	+3%	-1%
Waste	+26%	+7%	0%
All sectors	+224%	+67%	+5%

Mexico



GHG emissions by sector

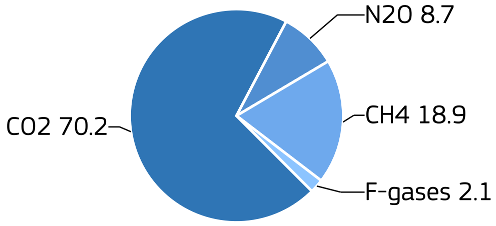


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	819.873	5.990	0.329	136.869M
2015	790.363	6.278	0.337	125.891M
2005	707.980	6.527	0.375	108.472M
1990	466.419	5.464	0.375	85.358M

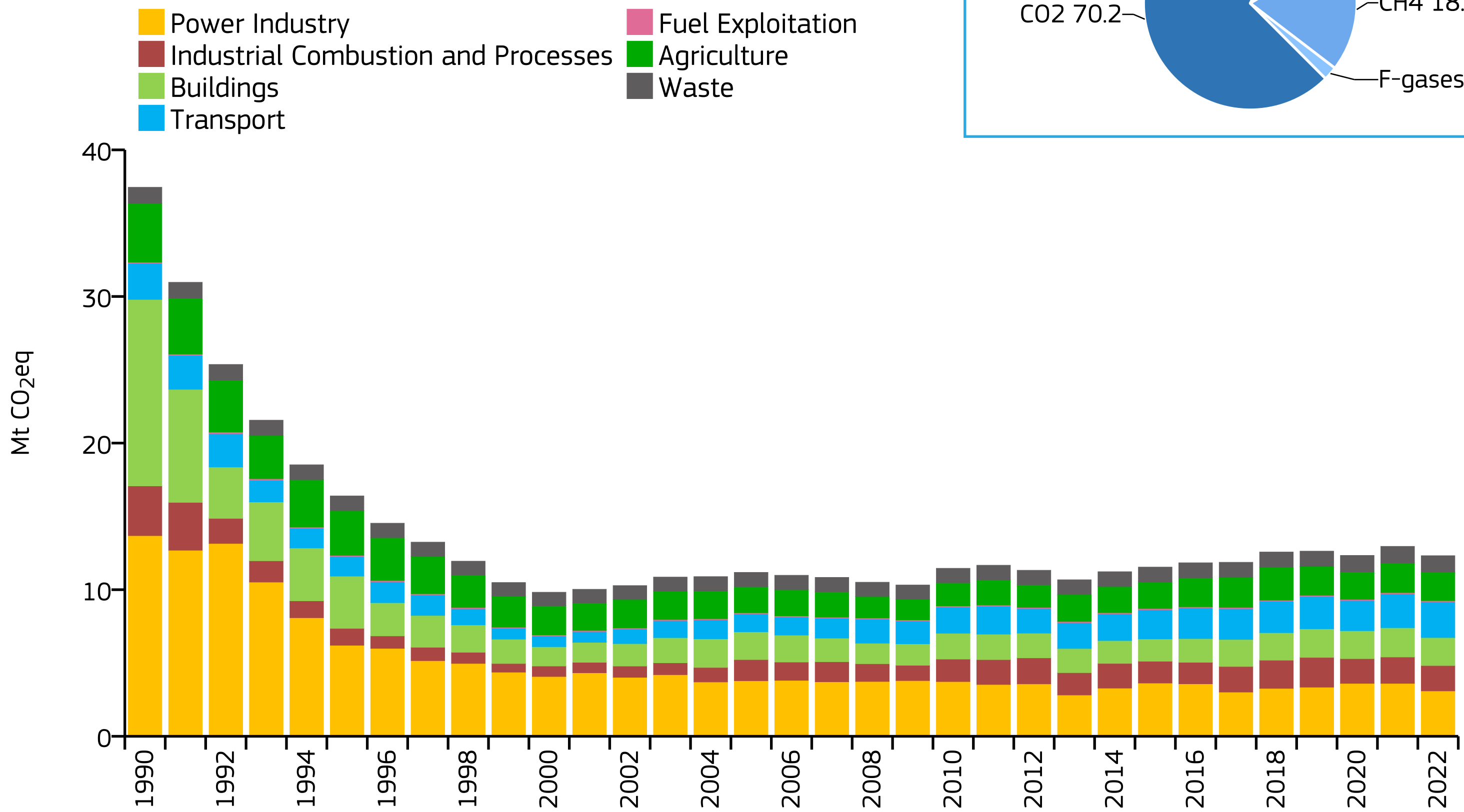
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+103%	-4%	+9%
Industrial Combustion and Processes	+148%	+48%	+3%
Buildings	+26%	+4%	+19%
Transport	+72%	+10%	+21%
Fuel Exploitation	+49%	-11%	+2%
Agriculture	+28%	+24%	+3%
Waste	+79%	+31%	+2%
All sectors	+76%	+16%	+7%

Moldova

GHG % in 2022



GHG emissions by sector

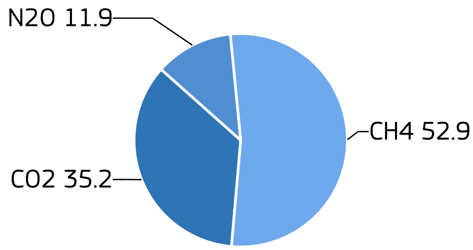


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	12.320	3.087	0.368	3.991M
2015	11.542	2.839	0.398	4.066M
2005	11.181	2.689	0.543	4.158M
1990	37.447	8.581	0.894	4.364M

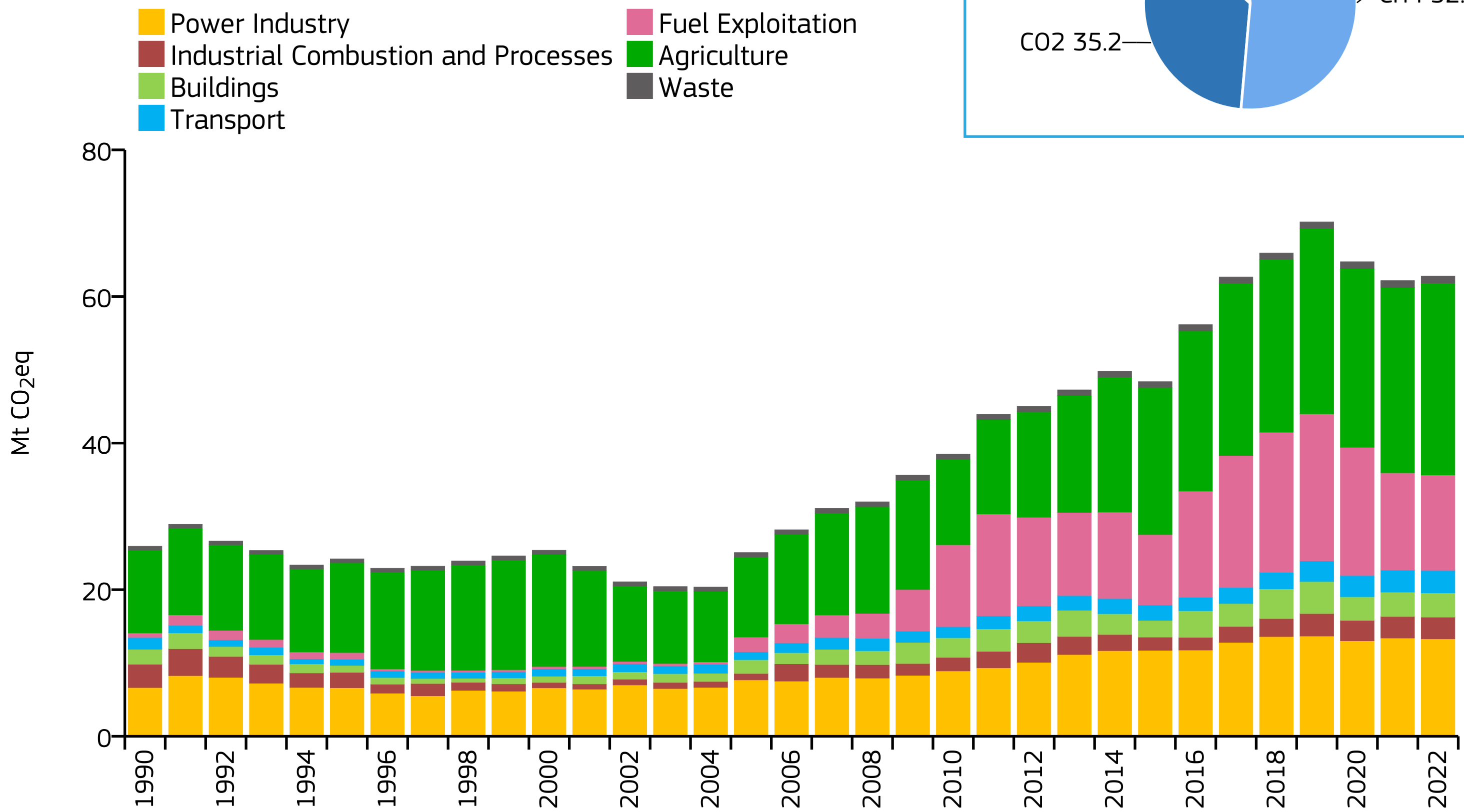
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-77%	-18%	-14%
Industrial Combustion and Processes	-49%	+20%	-4%
Buildings	-85%	+1%	-5%
Transport	-1%	+99%	+5%
Fuel Exploitation	+11%	+5%	0%
Agriculture	-51%	+10%	-4%
Waste	+2%	+14%	-1%
All sectors	-67%	+10%	-5%

Mongolia

GHG % in 2022



GHG emissions by sector

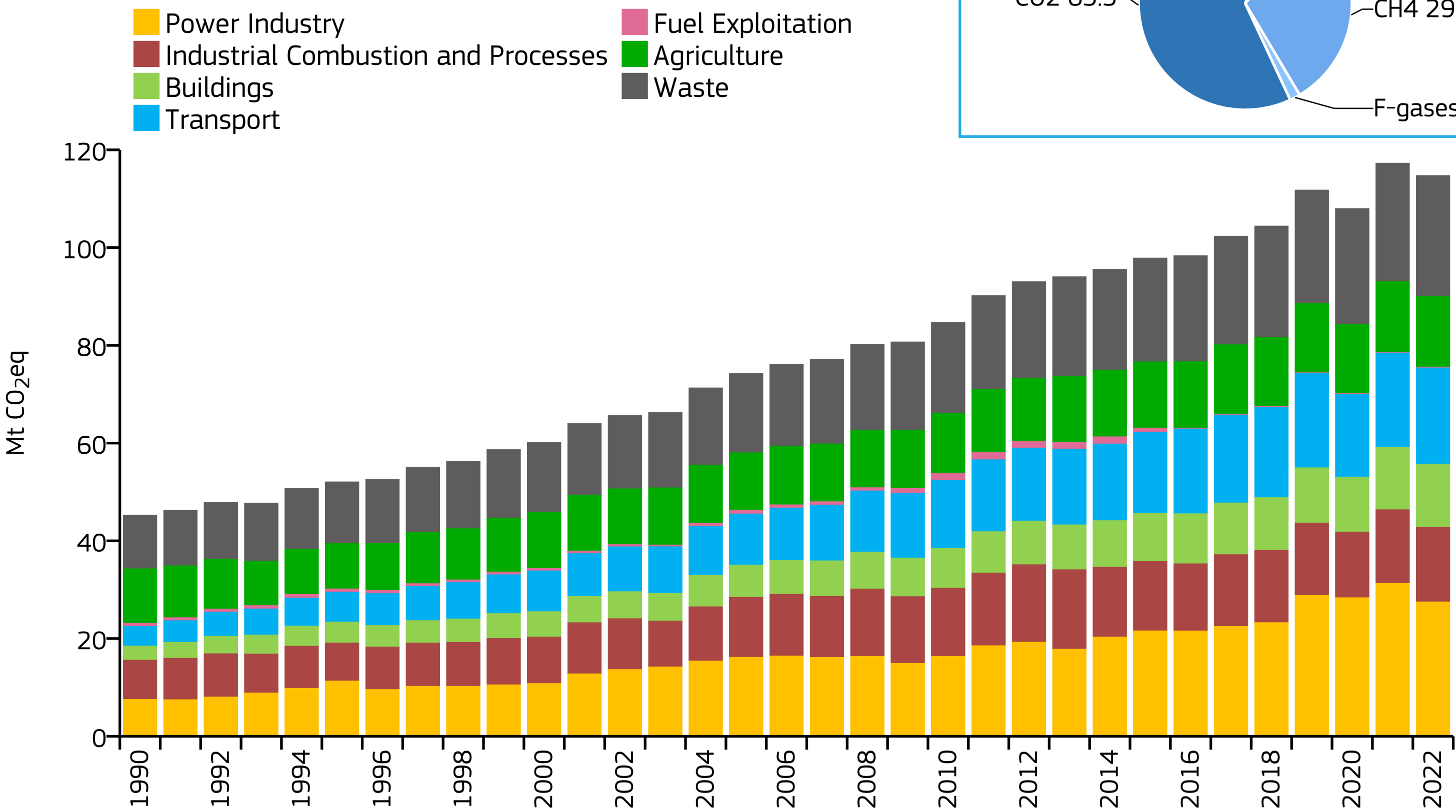


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	62.790	19.074	1.533	3.292M
2015	48.376	16.250	1.465	2.977M
2005	25.064	9.920	1.688	2.526M
1990	25.924	11.869	2.385	2.184M

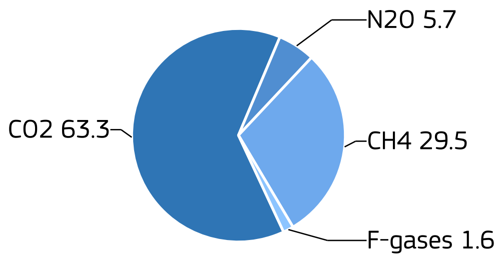
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+100%	+73%	-1%
Industrial Combustion and Processes	-7%	+239%	+1%
Buildings	+61%	+75%	-1%
Transport	+92%	+185%	+2%
Fuel Exploitation	> +300%	> +300%	-2%
Agriculture	+131%	+140%	+4%
Waste	+89%	+58%	+2%
All sectors	+142%	+151%	+1%

Morocco

GHG emissions by sector



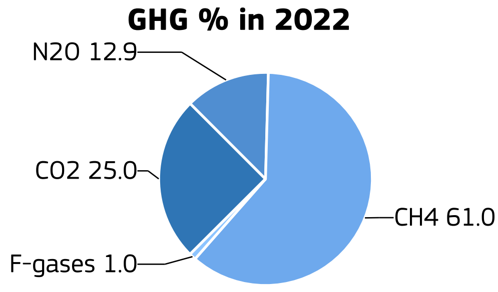
GHG % in 2022



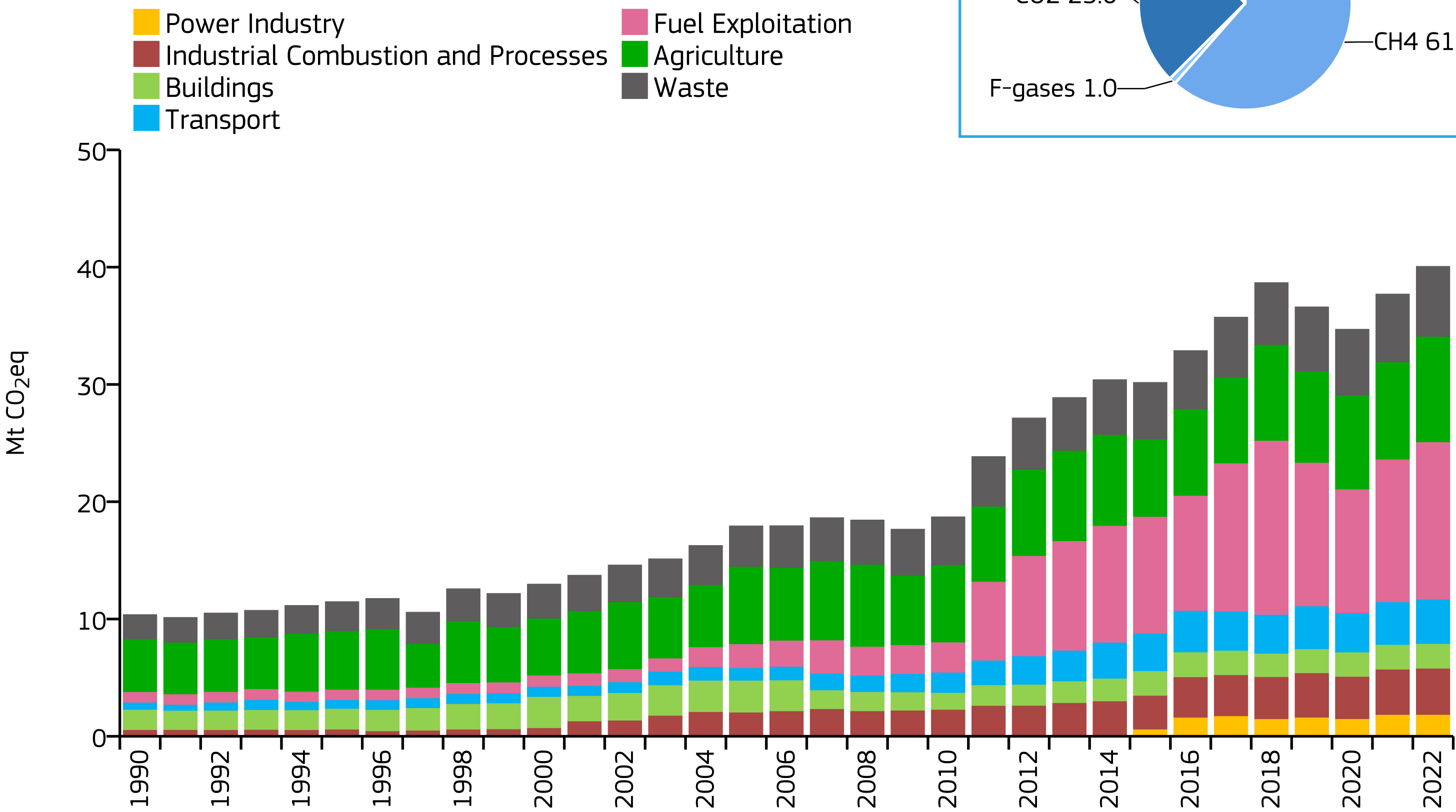
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	114.771	3.027	0.374	37.914M
2015	97.884	2.812	0.362	34.803M
2005	74.238	2.432	0.422	30.521M
1990	45.250	1.819	0.444	24.879M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+260%	+70%	-12%
Industrial Combustion and Processes	+89%	+24%	+1%
Buildings	> +300%	+96%	+2%
Transport	> +300%	+88%	+2%
Fuel Exploitation	-71%	-76%	+1%
Agriculture	+30%	+23%	0%
Waste	+127%	+53%	+2%
All sectors	+154%	+55%	-2%

Mozambique



GHG emissions by sector

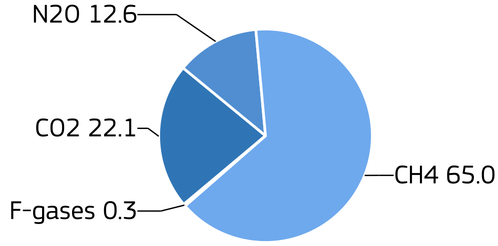


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	40.072	1.173	0.978	34.171M
2015	30.181	1.077	0.884	28.011M
2005	17.947	0.858	1.066	20.923M
1990	10.380	0.784	1.696	13.248M

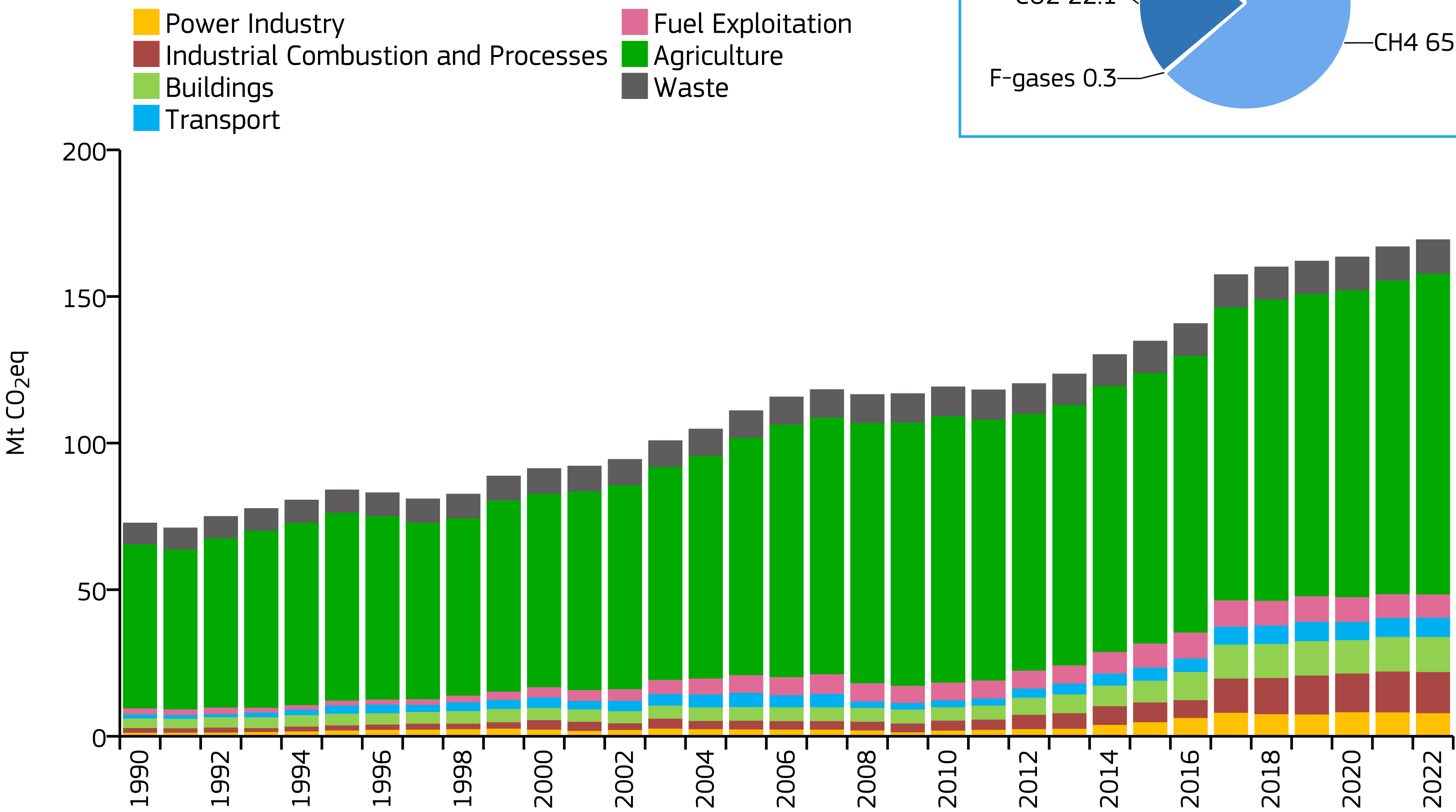
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	0%
Industrial Combustion and Processes	> +300%	+94%	+2%
Buildings	+22%	-23%	0%
Transport	> +300%	+256%	+3%
Fuel Exploitation	> +300%	> +300%	+11%
Agriculture	+100%	+36%	+8%
Waste	+187%	+72%	+3%
All sectors	+286%	+123%	+6%

Myanmar/Burma

GHG % in 2022



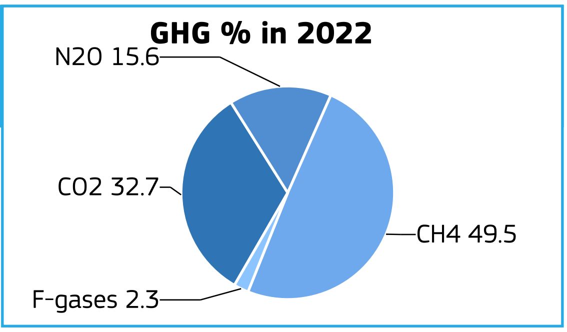
GHG emissions by sector



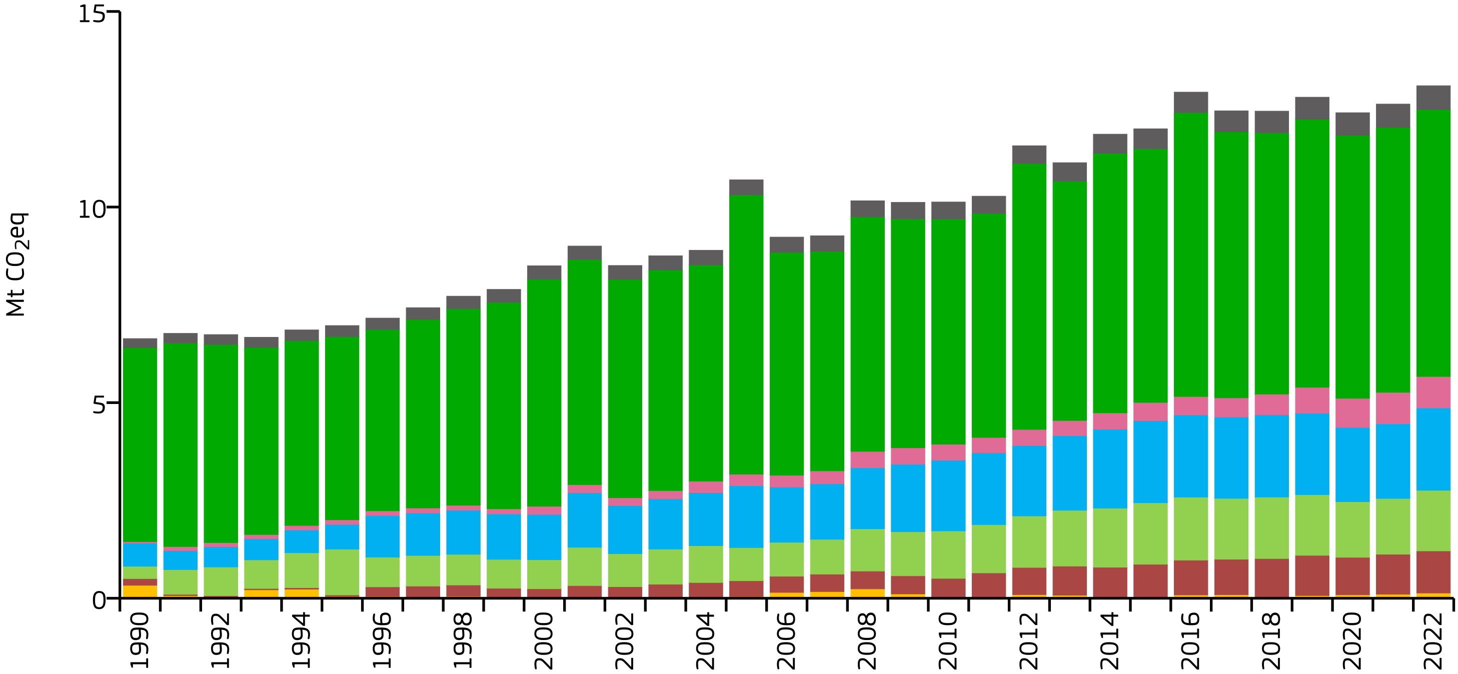
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	169.387	3.040	0.758	55.719M
2015	134.828	2.573	0.699	52.404M
2005	111.060	2.291	1.367	48.483M
1990	72.767	1.791	3.120	40.626M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+227%	-3%
Industrial Combustion and Processes	> +300%	> +300%	+1%
Buildings	+263%	+156%	+1%
Transport	> +300%	+36%	+3%
Fuel Exploitation	+285%	+32%	-2%
Agriculture	+96%	+35%	+2%
Waste	+60%	+25%	+1%
All sectors	+133%	+53%	+1%

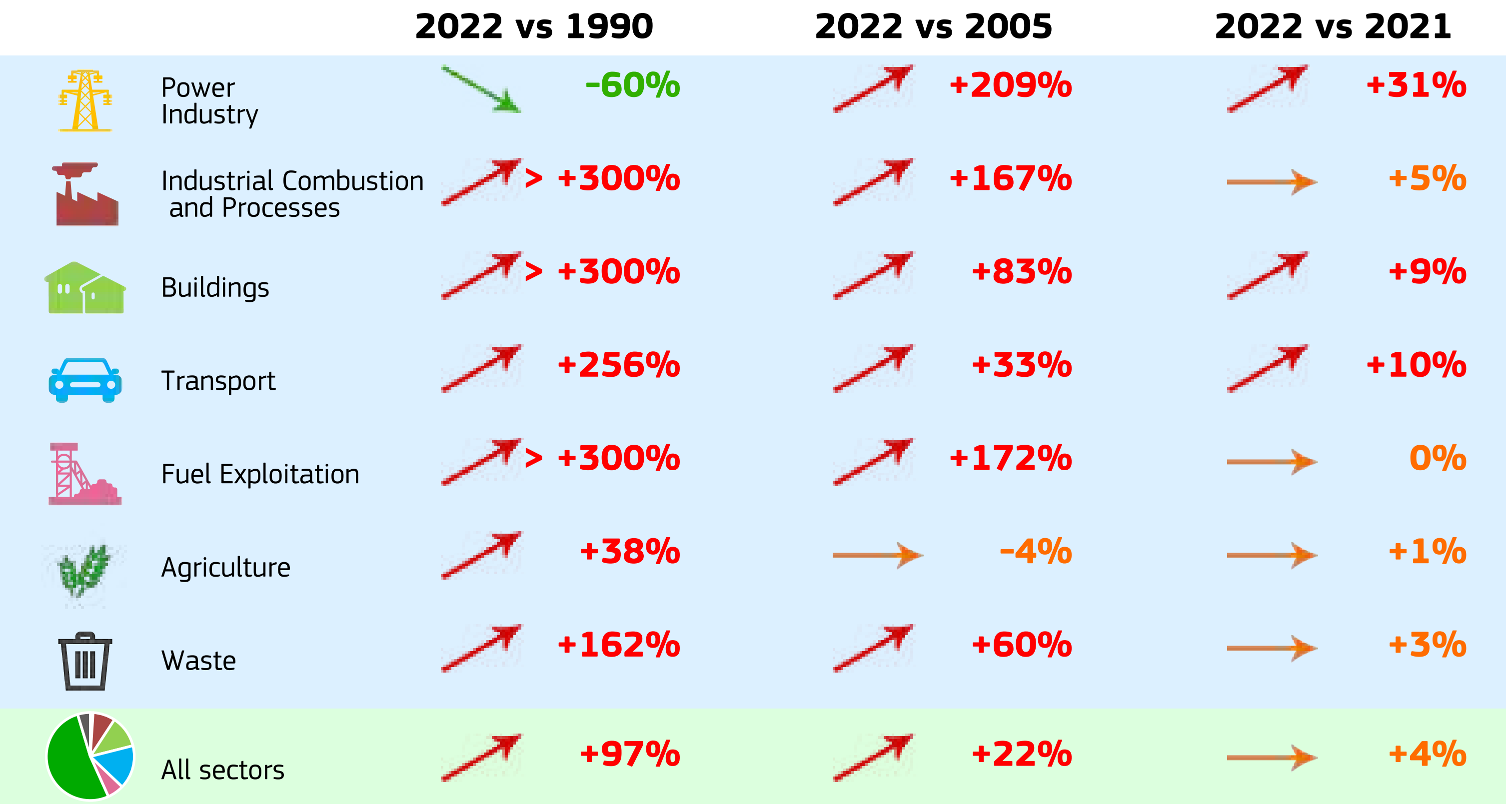
Namibia



GHG emissions by sector

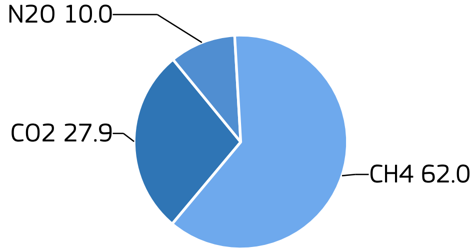


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	13.103	4.670	0.538	2.806M
2015	12.000	4.948	0.486	2.426M
2005	10.697	5.264	0.689	2.032M
1990	6.638	4.692	0.779	1.415M

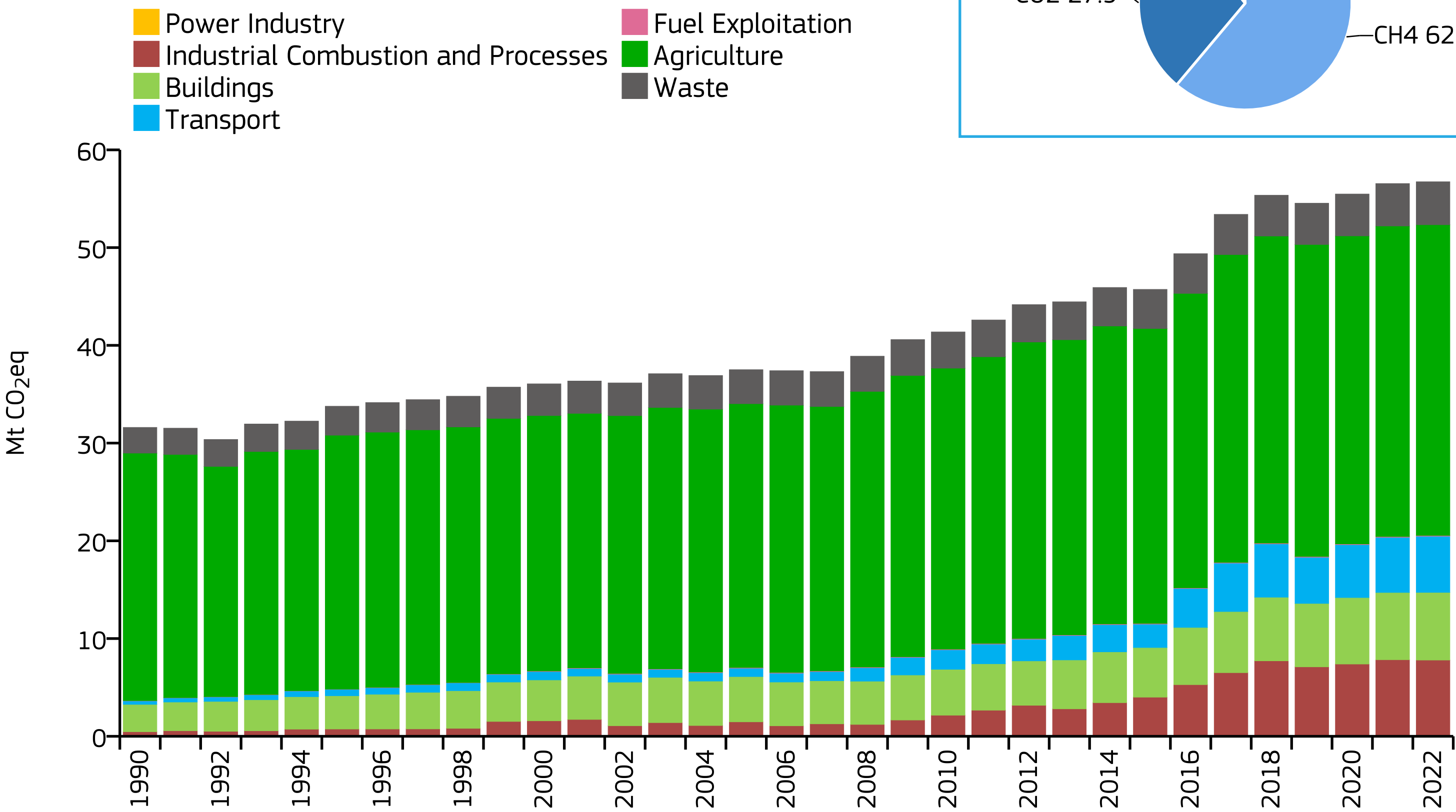


Nepal

GHG % in 2022



GHG emissions by sector

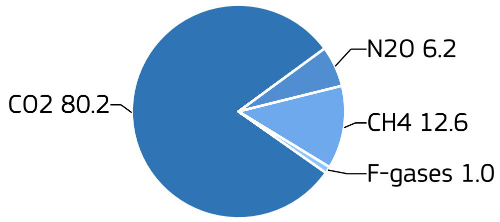


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	56.735	1.836	0.464	30.895M
2015	45.726	1.596	0.508	28.656M
2005	37.509	1.463	0.640	25.640M
1990	31.605	1.686	1.036	18.749M

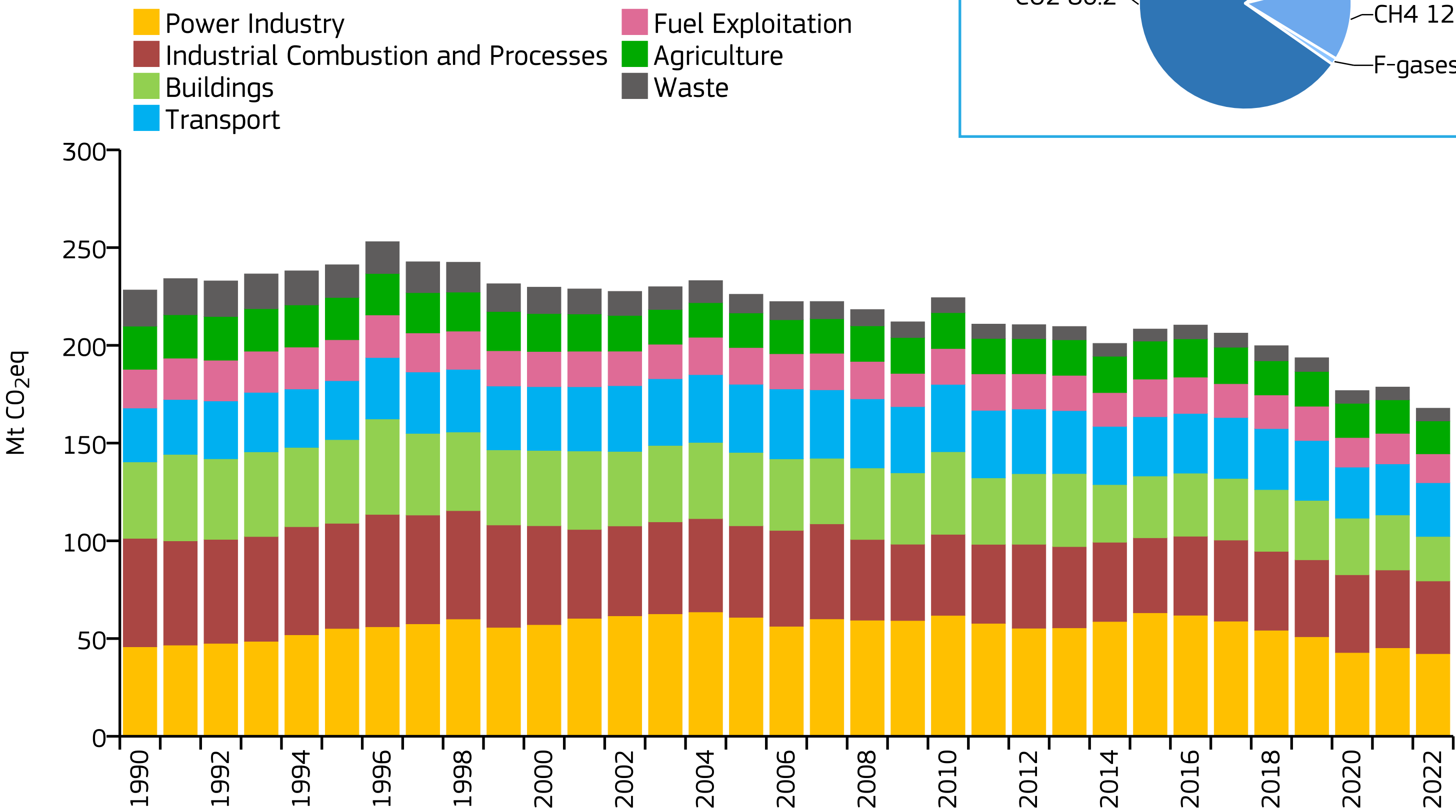
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	-100%	+2%
Industrial Combustion and Processes	> +300%	> +300%	0%
Buildings	+148%	+49%	+1%
Transport	> +300%	> +300%	+2%
Fuel Exploitation	+132%	+19%	+1%
Agriculture	+26%	+18%	0%
Waste	+67%	+26%	+1%
All sectors	+80%	+51%	0%

Netherlands

GHG % in 2022



GHG emissions by sector

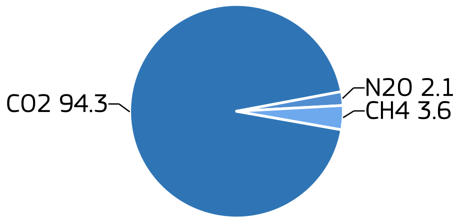


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	167.847	9.715	0.162	17.277M
2015	208.383	12.302	0.232	16.938M
2005	226.131	13.816	0.280	16.367M
1990	228.342	15.258	0.419	14.965M

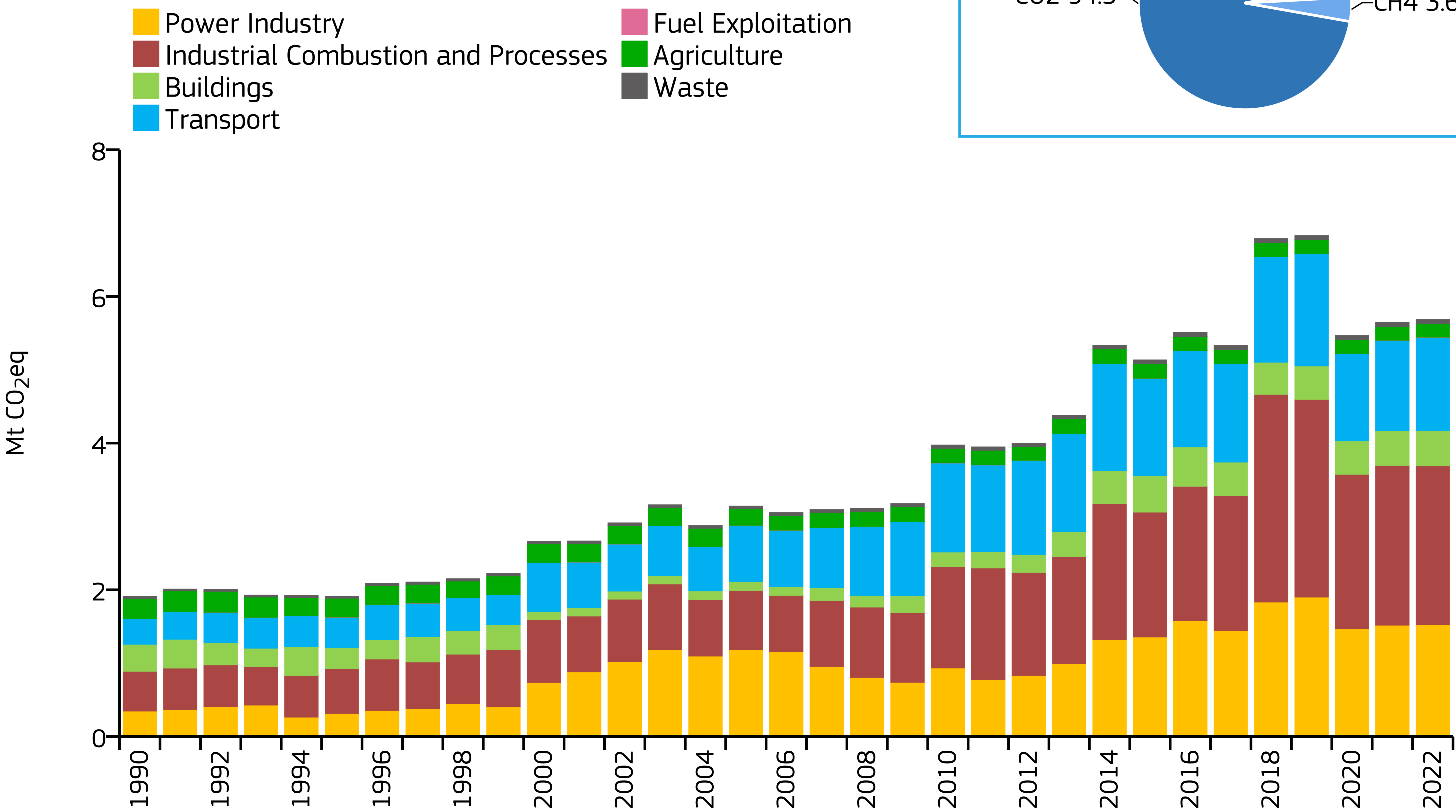
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-8%	-31%	-7%
Industrial Combustion and Processes	-33%	-21%	-7%
Buildings	-42%	-39%	-19%
Transport	0%	-21%	+5%
Fuel Exploitation	-25%	-21%	-5%
Agriculture	-24%	-5%	-2%
Waste	-65%	-32%	0%
All sectors	-26%	-26%	-6%

New Caledonia

GHG % in 2022



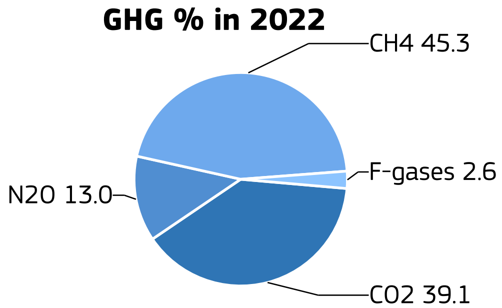
GHG emissions by sector



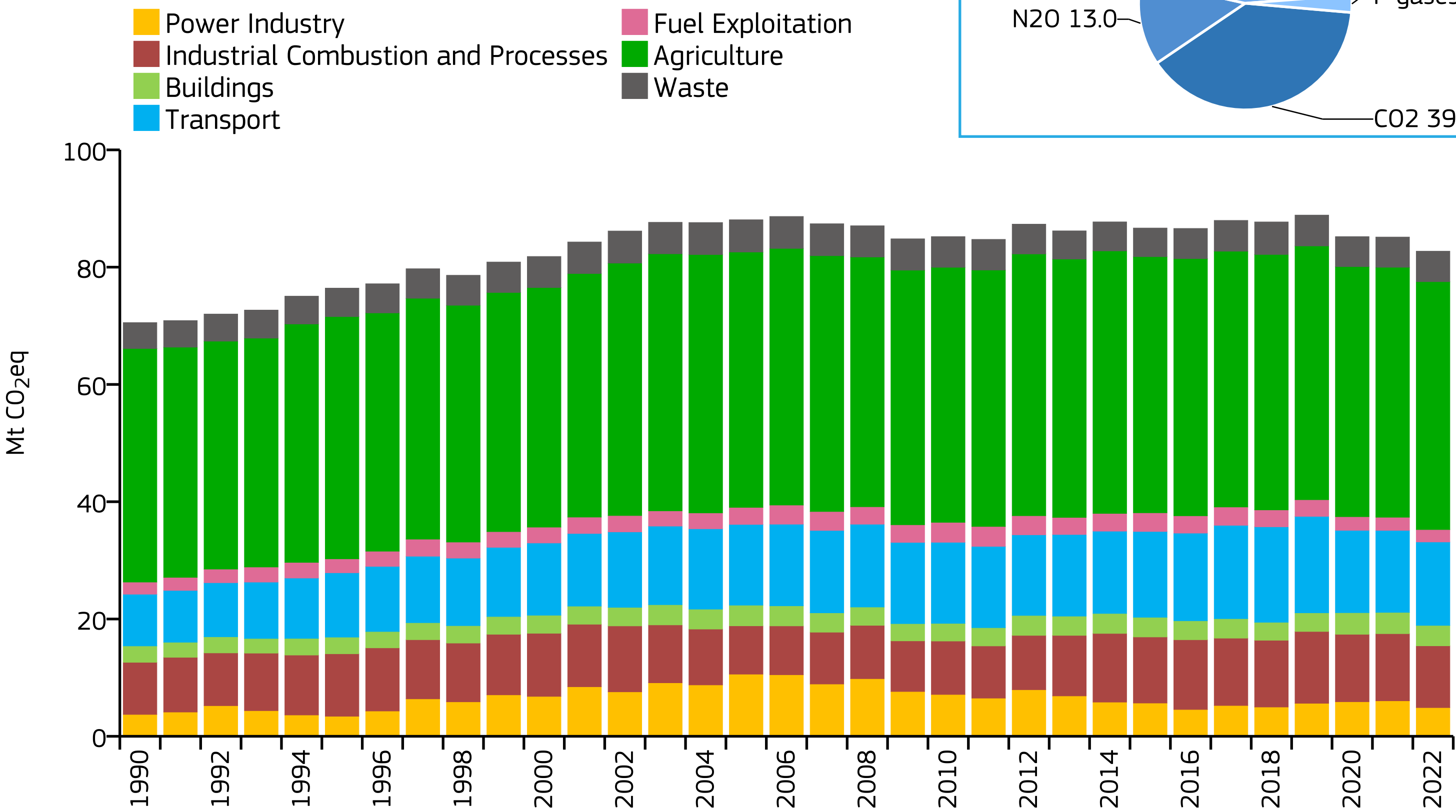
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	5.688	19.347	0.674	294.000k
2015	5.136	19.086	0.568	269.091k
2005	3.143	13.508	0.468	232.686k
1990	1.909	11.242	0.410	169.787k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+29%	0%
Industrial Combustion and Processes	+299%	+168%	0%
Buildings	+31%	+293%	+2%
Transport	+268%	+66%	+3%
Fuel Exploitation	+218%	+37%	0%
Agriculture	-34%	-17%	-1%
Waste	+118%	+47%	+2%
All sectors	+198%	+81%	+1%

New Zealand



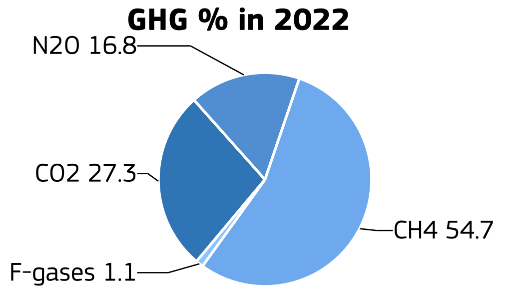
GHG emissions by sector



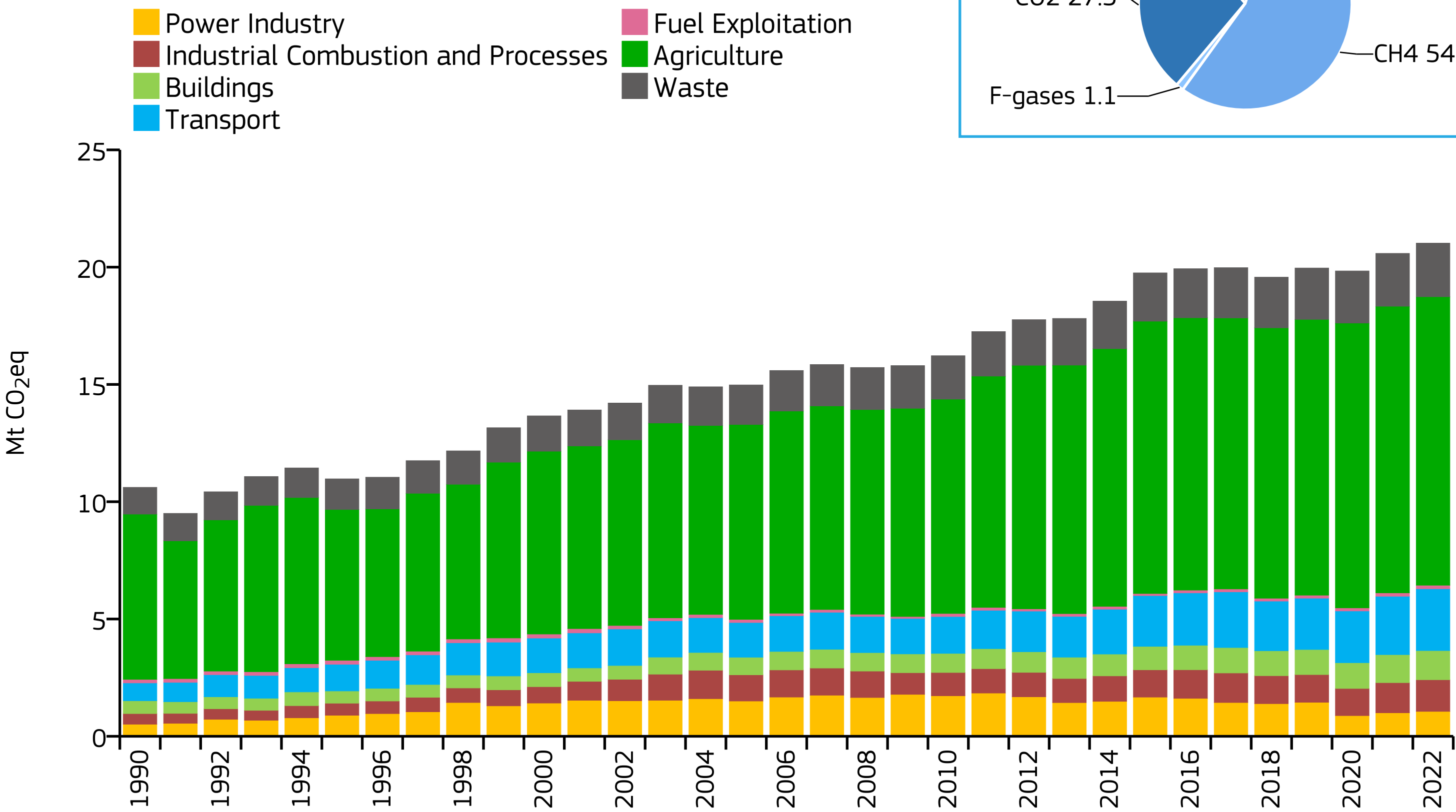
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	82.720	16.827	0.360	4.916M
2015	86.677	18.784	0.458	4.615M
2005	88.082	21.300	0.572	4.135M
1990	70.544	20.760	0.757	3.398M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	↗ +31%	↘ -54%	↘ -19%
Industrial Combustion and Processes	↗ +19%	↗ +28%	↘ -8%
Buildings	↗ +25%	→ -1%	→ -4%
Transport	↗ +61%	→ +3%	→ +2%
Fuel Exploitation	→ +3%	↘ -27%	→ -5%
Agriculture	↗ +6%	→ -3%	→ -1%
Waste	↗ +18%	→ -5%	→ +1%
All sectors	↗ +17%	↘ -6%	→ -3%

Nicaragua



GHG emissions by sector

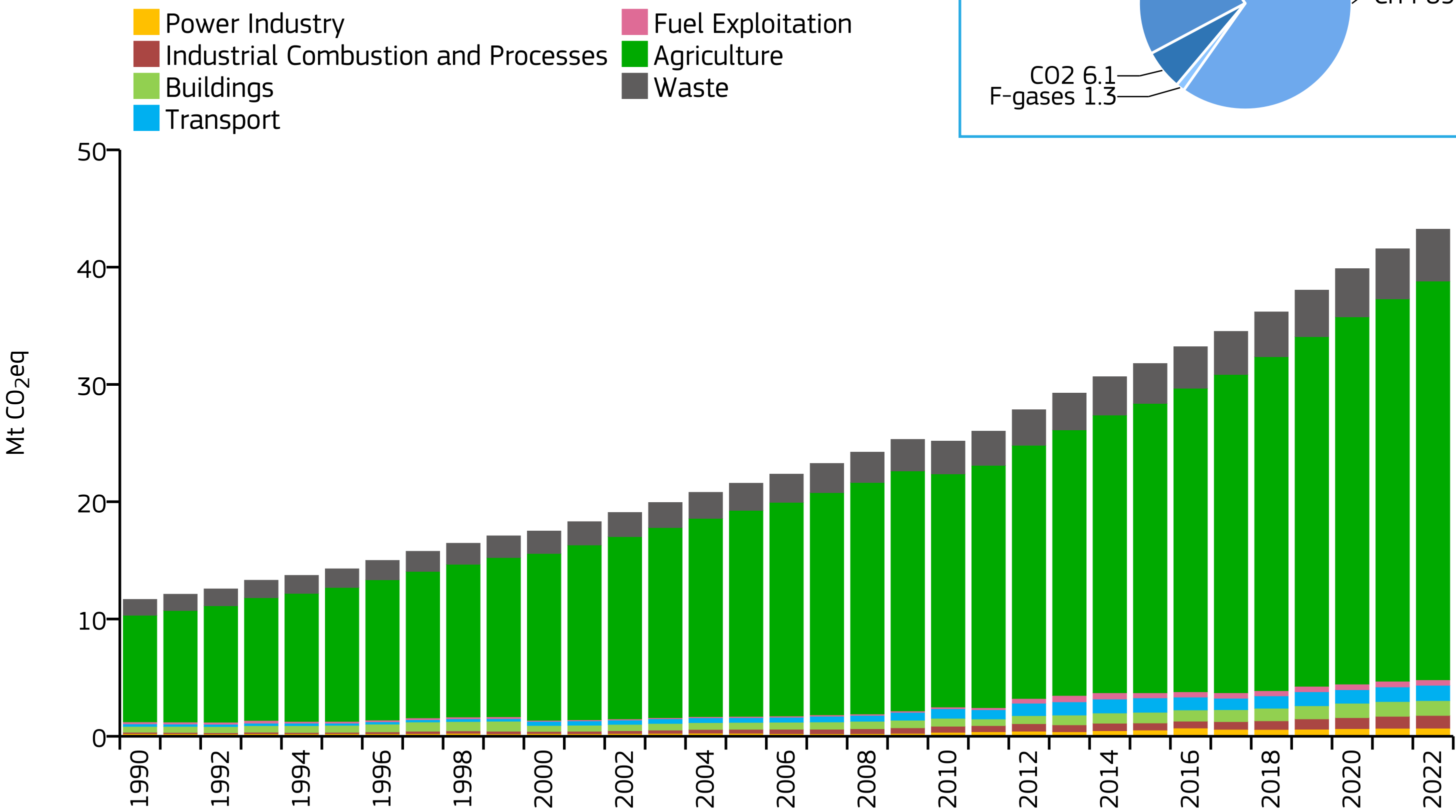


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	21.025	3.213	0.520	6.544M
2015	19.757	3.248	0.564	6.082M
2005	14.980	2.785	0.637	5.379M
1990	10.614	2.561	0.736	4.145M

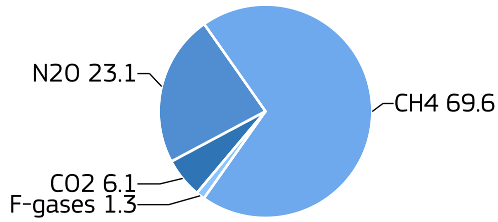
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+106%	-29%	+6%
Industrial Combustion and Processes	+198%	+21%	+5%
Buildings	+127%	+65%	+4%
Transport	+247%	+78%	+6%
Fuel Exploitation	-1%	+11%	+4%
Agriculture	+75%	+48%	+1%
Waste	+100%	+35%	+1%
All sectors	+98%	+40%	+2%

Niger

GHG emissions by sector



GHG % in 2022

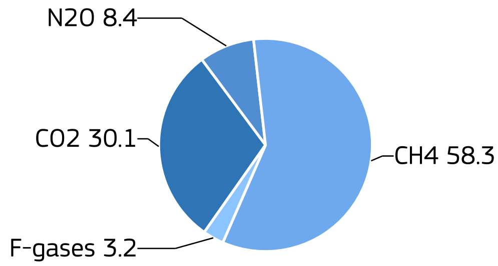


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	43.240	1.665	1.294	25.972M
2015	31.791	1.598	1.405	19.897M
2005	21.581	1.585	1.649	13.618M
1990	11.679	1.458	1.294	8.013M

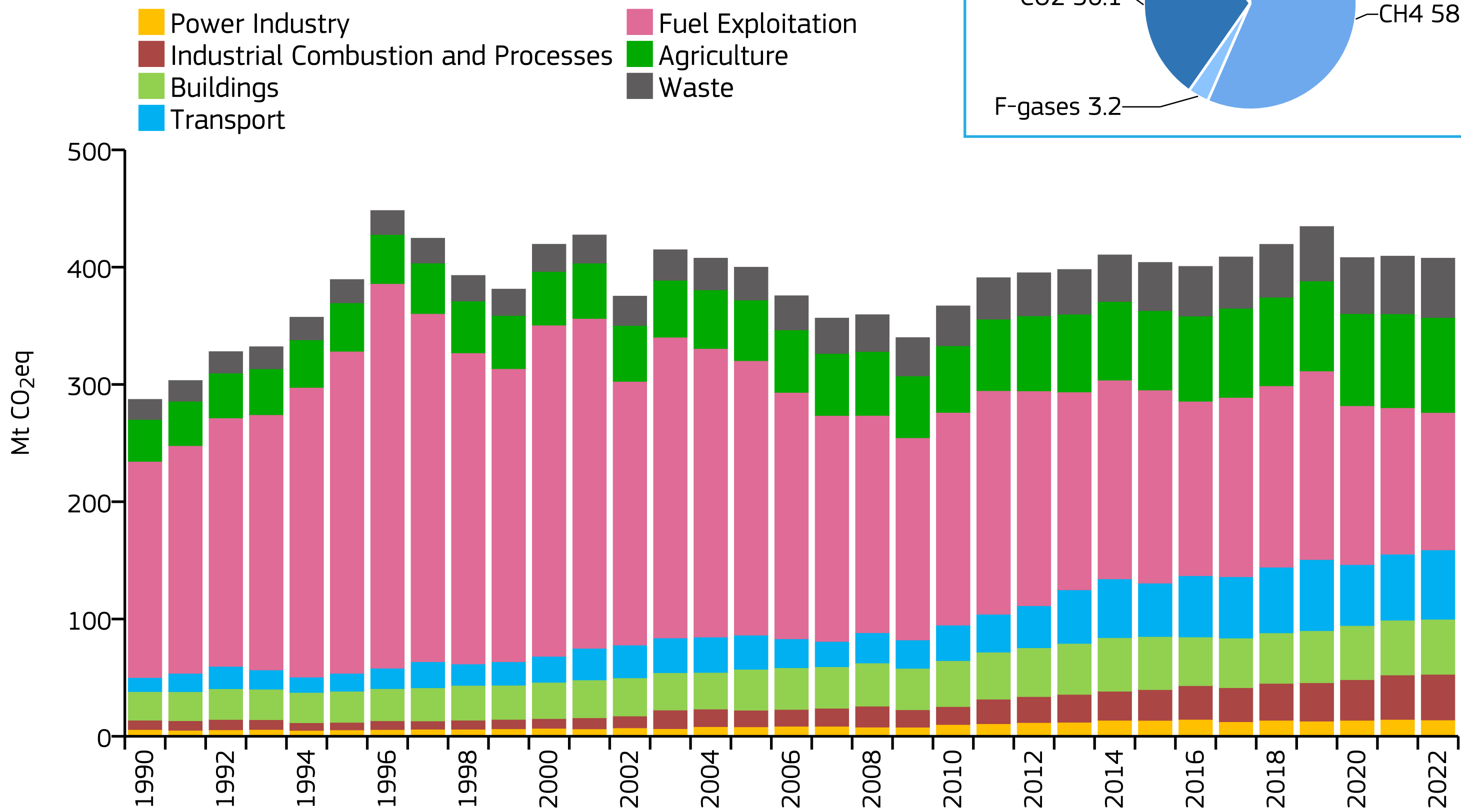
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+207%	+176%	+2%
Industrial Combustion and Processes	> +300%	+220%	+6%
Buildings	+155%	+116%	+1%
Transport	> +300%	+218%	+5%
Fuel Exploitation	+172%	> +300%	-5%
Agriculture	+274%	+93%	+4%
Waste	+226%	+91%	+4%
All sectors	+270%	+100%	+4%

Nigeria

GHG % in 2022



GHG emissions by sector

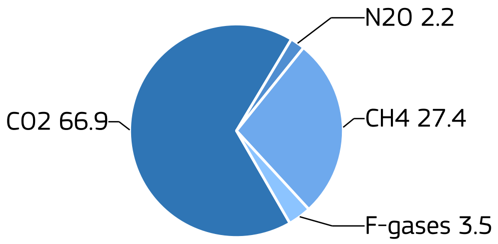


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	407.690	1.880	0.376	216.844M
2015	404.084	2.230	0.405	181.182M
2005	399.979	2.879	0.721	138.939M
1990	287.314	3.016	0.926	95.270M

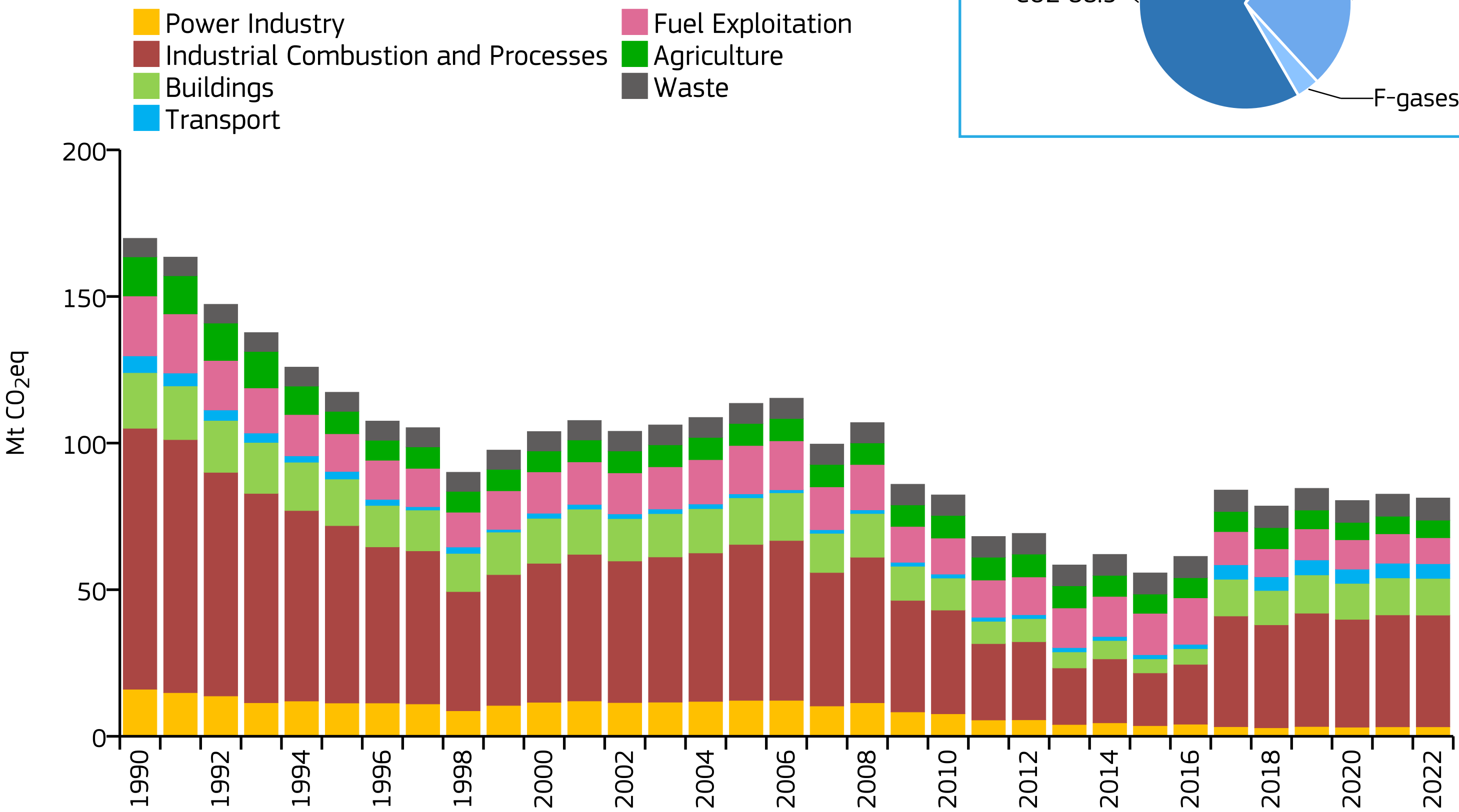
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+143%	+74%	-3%
Industrial Combustion and Processes	> +300%	+174%	+3%
Buildings	+93%	+35%	0%
Transport	> +300%	+103%	+5%
Fuel Exploitation	-36%	-50%	-6%
Agriculture	+127%	+57%	+1%
Waste	+194%	+80%	+3%
All sectors	+42%	+2%	0%

North Korea

GHG % in 2022



GHG emissions by sector

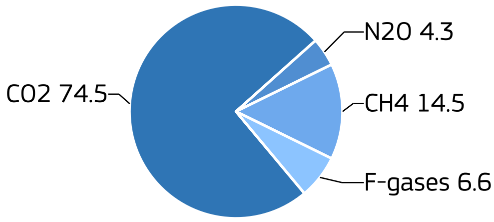


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	81.293	3.120	0.664	26.057M
2015	55.746	2.208	0.519	25.244M
2005	113.563	4.751	1.178	23.904M
1990	169.836	8.369	1.639	20.293M

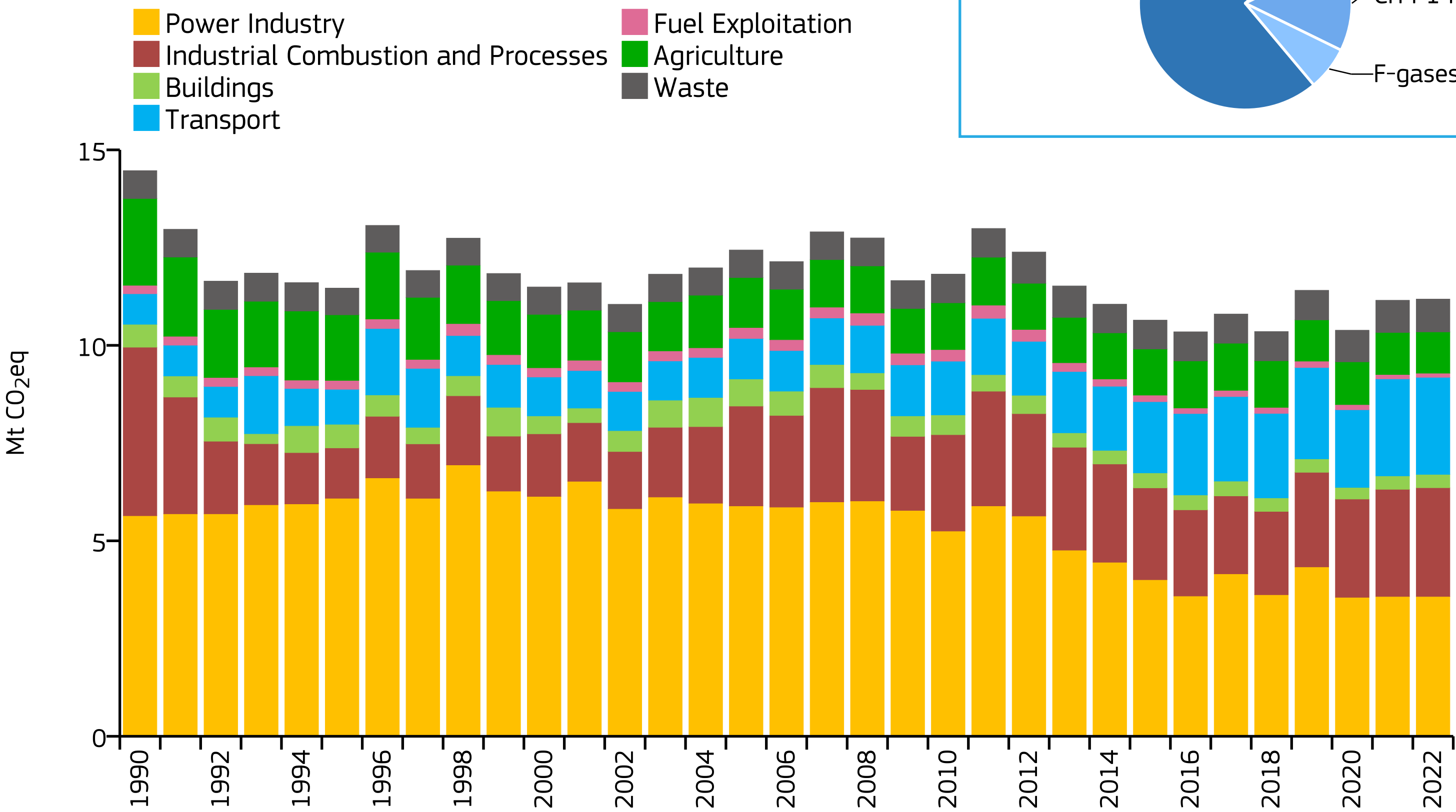
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-80%	-74%	0%
Industrial Combustion and Processes	-57%	-28%	0%
Buildings	-34%	-21%	-1%
Transport	-12%	+276%	0%
Fuel Exploitation	-57%	-46%	-12%
Agriculture	-55%	-20%	0%
Waste	+20%	+10%	+1%
All sectors	-52%	-28%	-2%

North Macedonia

GHG % in 2022



GHG emissions by sector

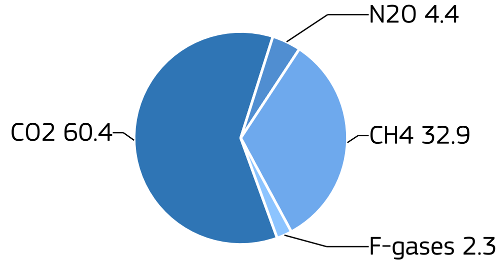


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	11.184	5.354	0.317	2.089M
2015	10.645	5.120	0.340	2.079M
2005	12.440	6.038	0.545	2.060M
1990	14.469	7.248	0.637	1.996M

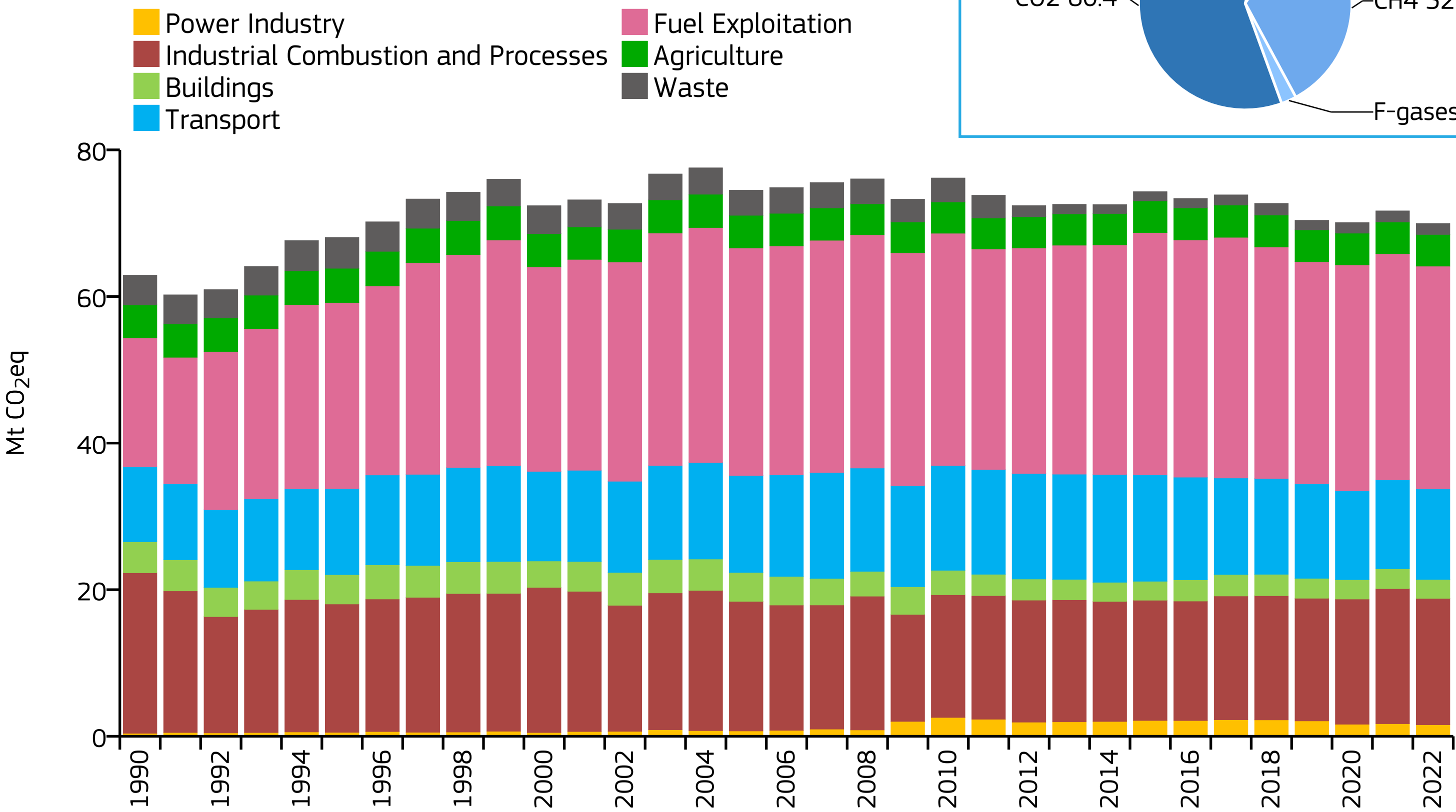
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-37%	-39%	0%
Industrial Combustion and Processes	-35%	+9%	+1%
Buildings	-42%	-51%	0%
Transport	+218%	+139%	0%
Fuel Exploitation	-52%	-62%	-6%
Agriculture	-52%	-17%	-2%
Waste	+18%	+19%	+2%
All sectors	-23%	-10%	0%

Norway

GHG % in 2022



GHG emissions by sector

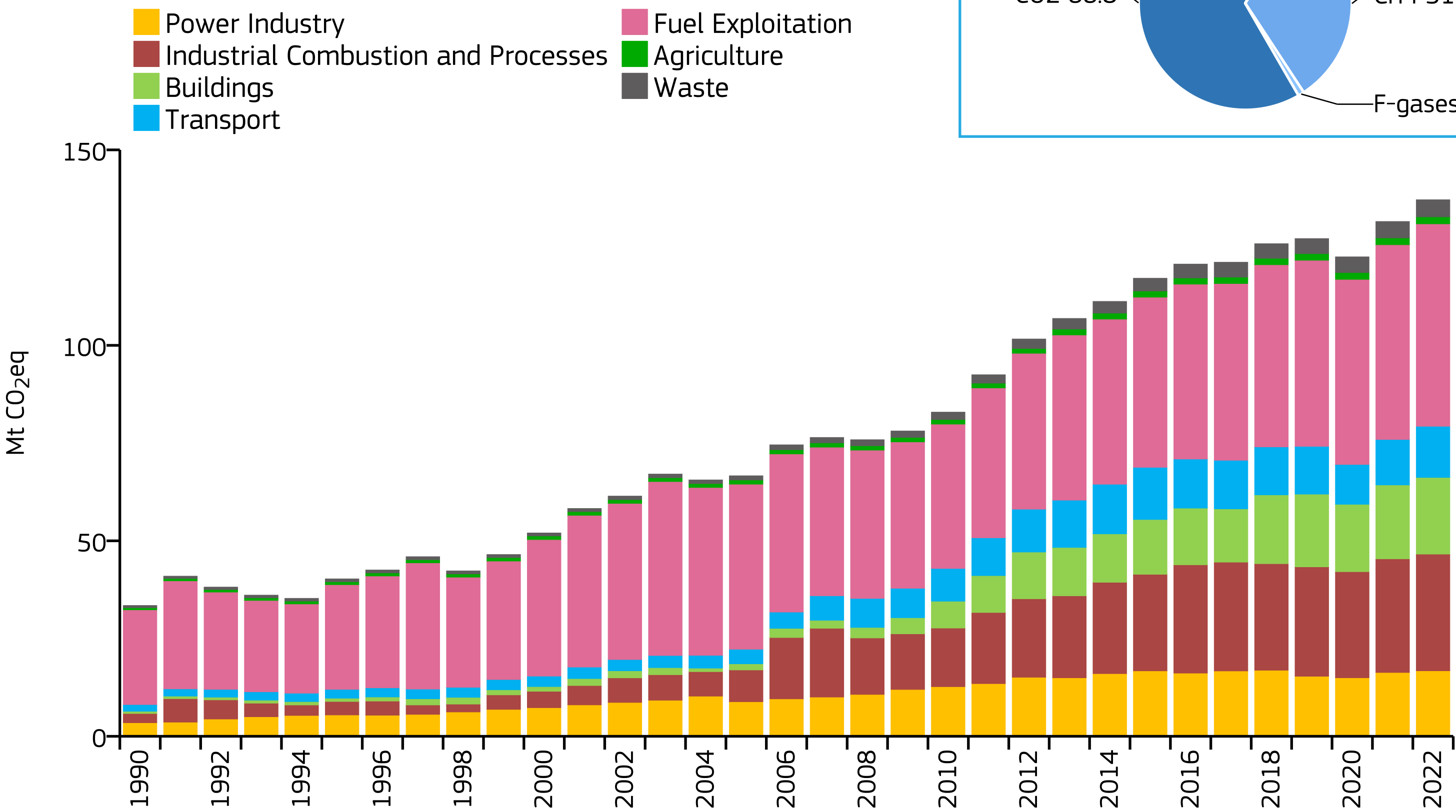


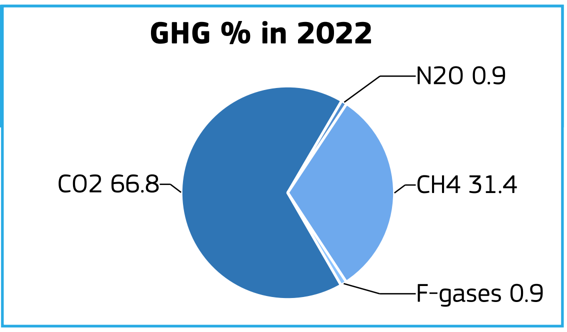
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	69.965	12.602	0.190	5.552M
2015	74.296	14.288	0.226	5.200M
2005	74.509	16.084	0.259	4.632M
1990	62.914	14.813	0.351	4.247M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+288%	+116%	-8%
Industrial Combustion and Processes	-21%	-3%	-6%
Buildings	-39%	-34%	-5%
Transport	+21%	-7%	+2%
Fuel Exploitation	+73%	-2%	-1%
Agriculture	-4%	-3%	0%
Waste	-63%	-56%	-1%
All sectors	+11%	-6%	-2%

Oman

GHG emissions by sector

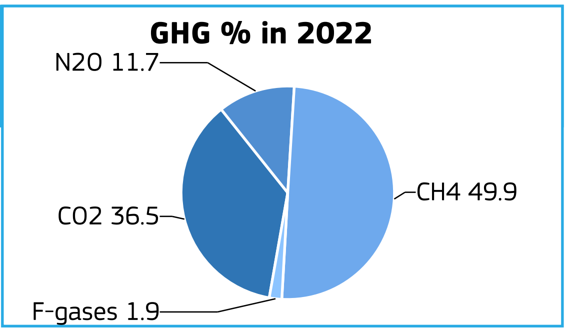




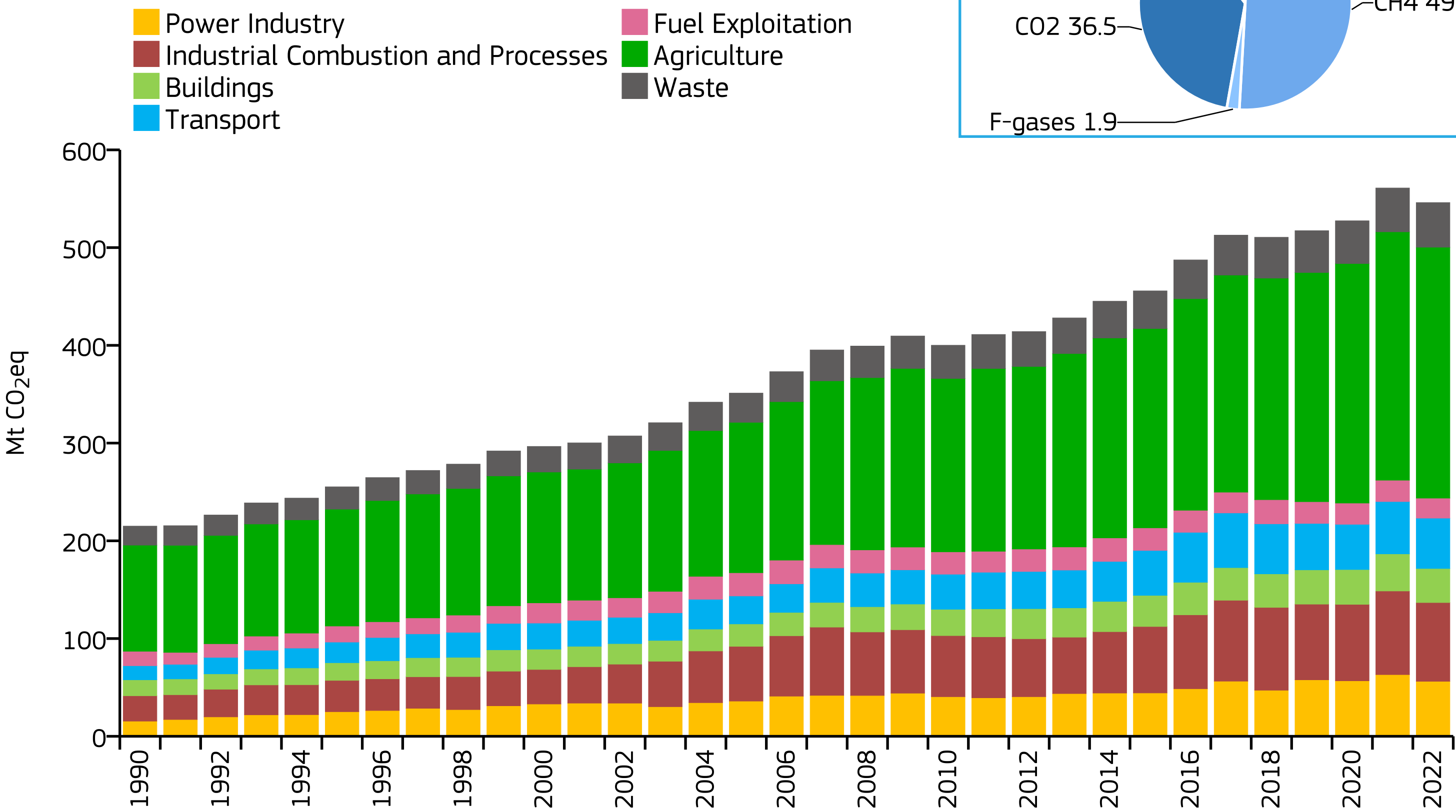
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	137.244	25.586	0.849	5.364M
2015	117.168	27.899	0.794	4.200M
2005	66.648	26.539	0.728	2.511M
1990	33.465	18.467	0.609	1.812M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+89%	+3%
Industrial Combustion and Processes	> +300%	+268%	+3%
Buildings	> +300%	> +300%	+4%
Transport	> +300%	+251%	+13%
Fuel Exploitation	+114%	+23%	+4%
Agriculture	+220%	+69%	+2%
Waste	> +300%	+295%	+4%
All sectors	> +300%	+106%	+4%

Pakistan



GHG emissions by sector

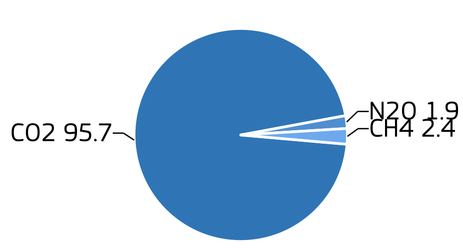


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	546.099	2.530	0.425	215.824M
2015	455.753	2.407	0.475	189.381M
2005	351.129	2.281	0.525	153.910M
1990	215.033	1.997	0.609	107.679M

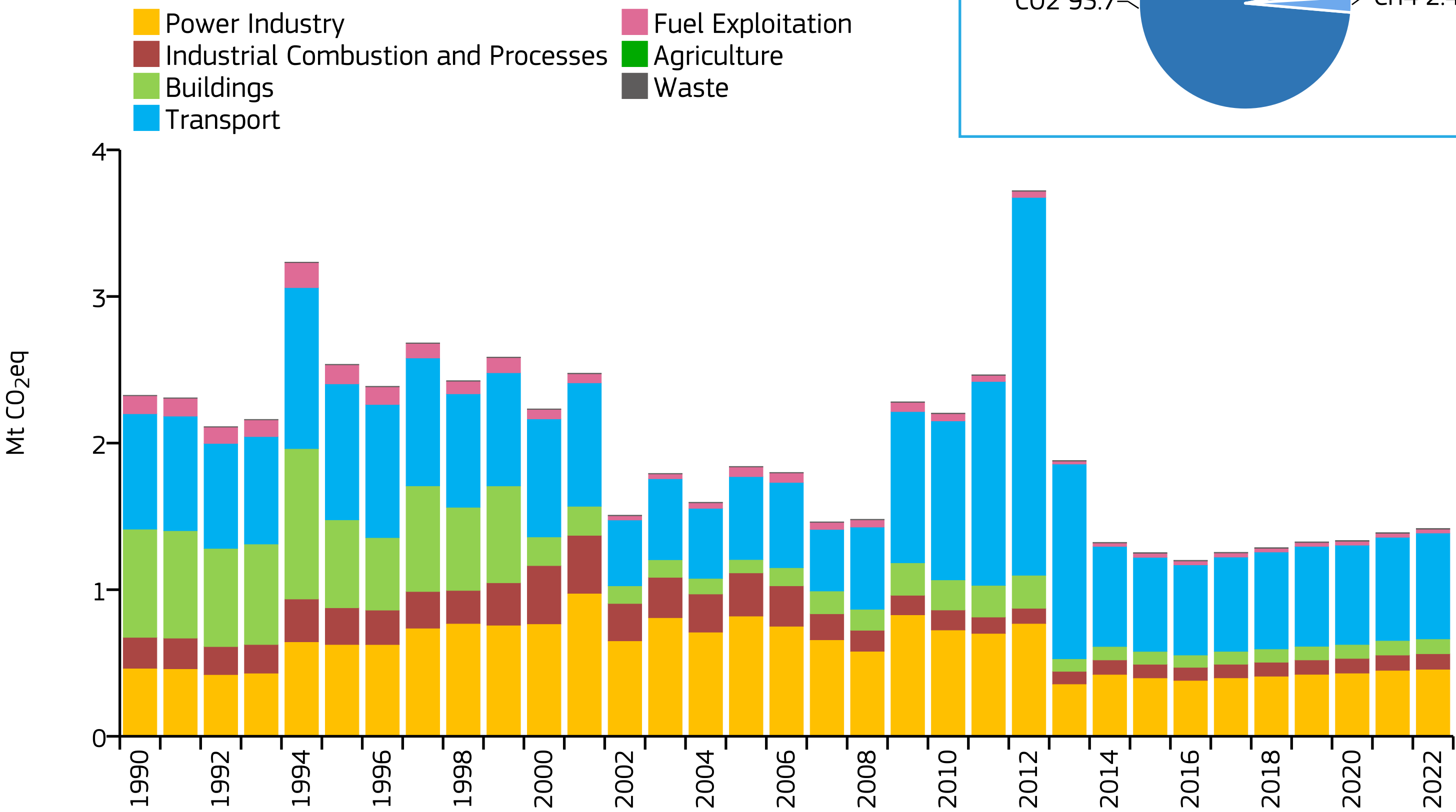
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+263%	+56%	-11%
Industrial Combustion and Processes	+210%	+44%	-6%
Buildings	+113%	+52%	-8%
Transport	+257%	+80%	-4%
Fuel Exploitation	+38%	-14%	-7%
Agriculture	+137%	+67%	+1%
Waste	+135%	+53%	+2%
All sectors	+154%	+56%	-3%

Palau

GHG % in 2022



GHG emissions by sector

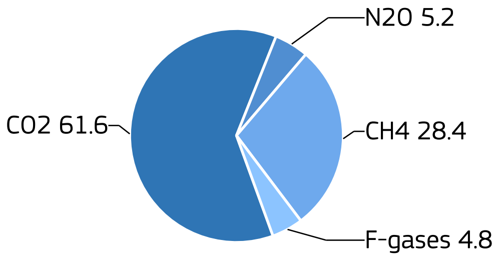


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.418	61.655	6.512	23.000k
2015	1.253	58.867	3.827	21.288k
2005	1.841	92.490	6.036	19.906k
1990	2.326	154.179	10.843	15.088k

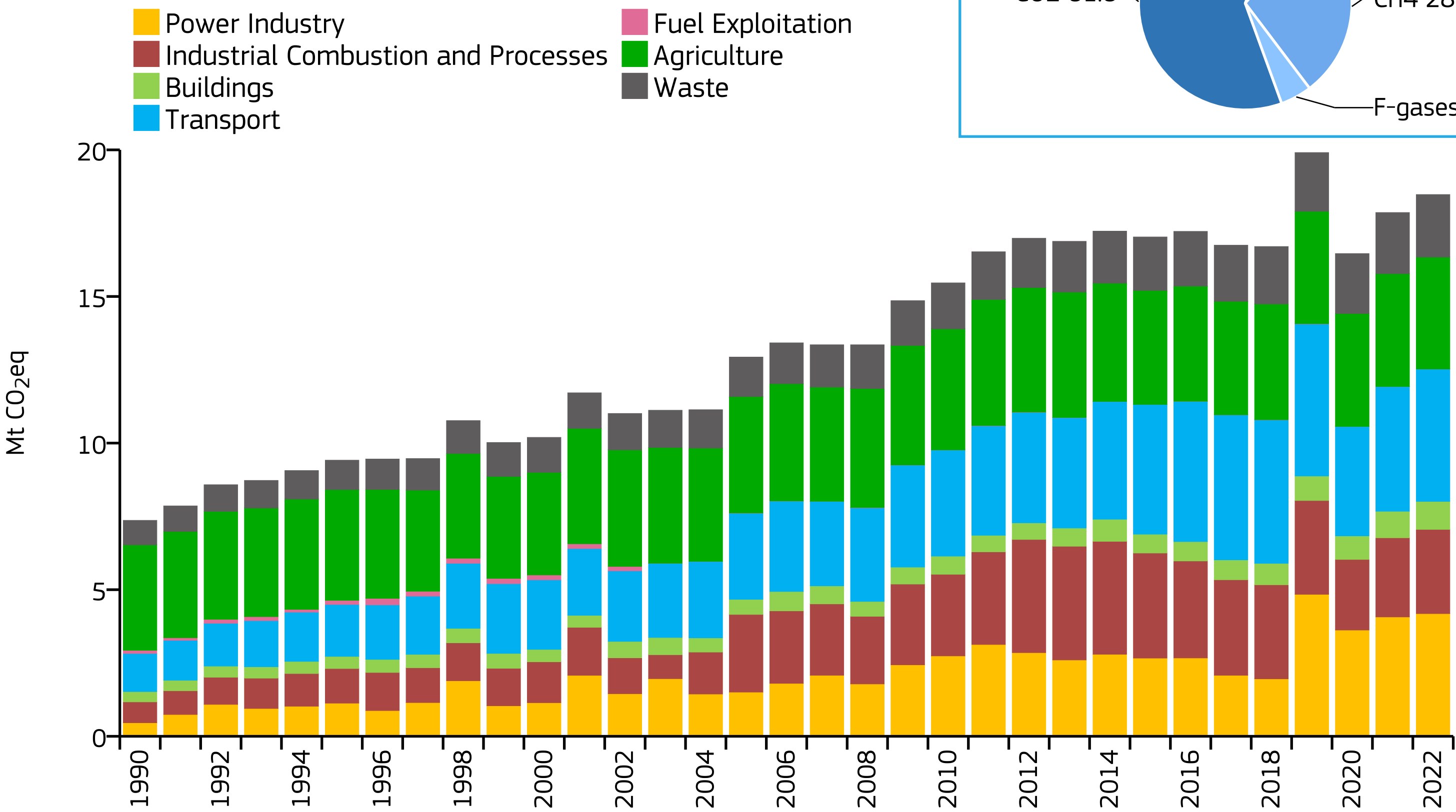
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-1%	-44%	+2%
Industrial Combustion and Processes	-50%	-64%	+2%
Buildings	-86%	+11%	+2%
Transport	-8%	+28%	+3%
Fuel Exploitation	-79%	-60%	-1%
Agriculture	n/a	n/a	n/a
Waste	+57%	+26%	+3%
All sectors	-39%	-23%	+2%

Panama

GHG % in 2022



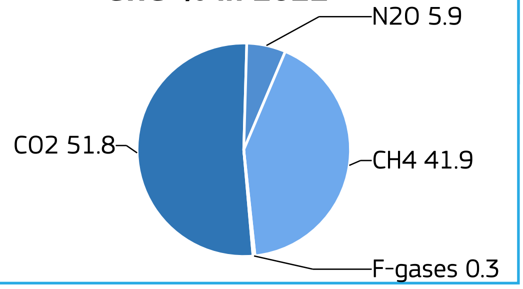
GHG emissions by sector



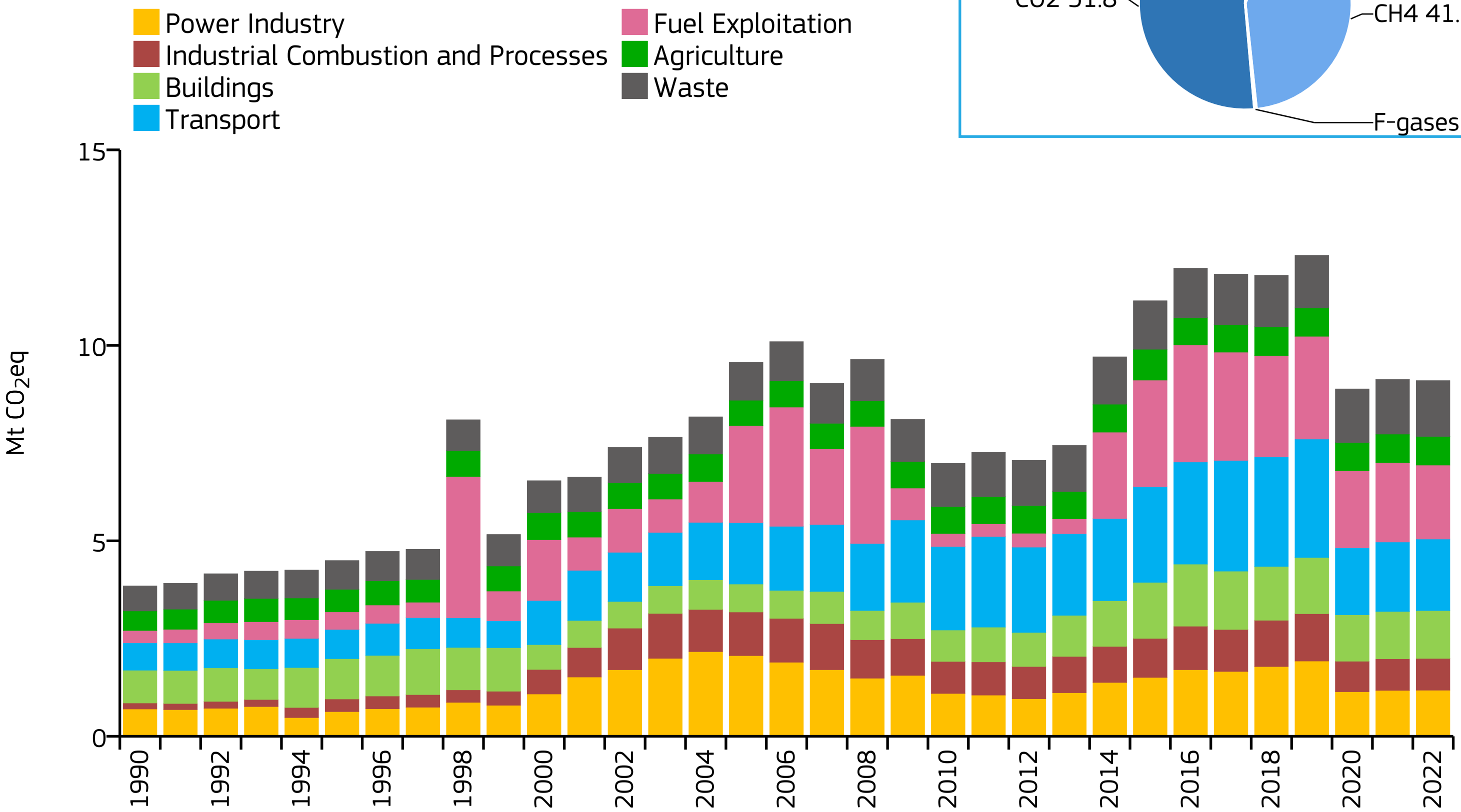
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	18.478	4.186	0.126	4.414M
2015	17.031	4.291	0.146	3.969M
2005	12.935	3.884	0.230	3.330M
1990	7.366	2.981	0.268	2.471M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+178%	+3%
Industrial Combustion and Processes	> +300%	+8%	+6%
Buildings	+172%	+85%	+6%
Transport	+247%	+54%	+6%
Fuel Exploitation	-97%	-48%	0%
Agriculture	+6%	-4%	-1%
Waste	+155%	+58%	+2%
All sectors	+151%	+43%	+3%

Papua New Guinea



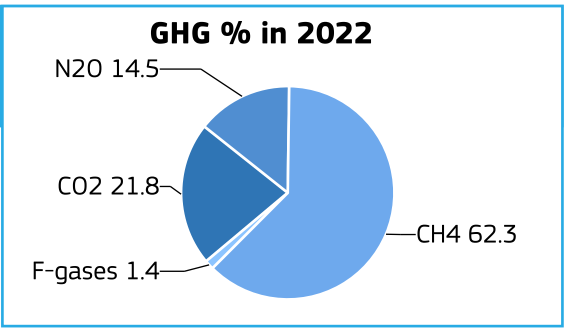
GHG emissions by sector



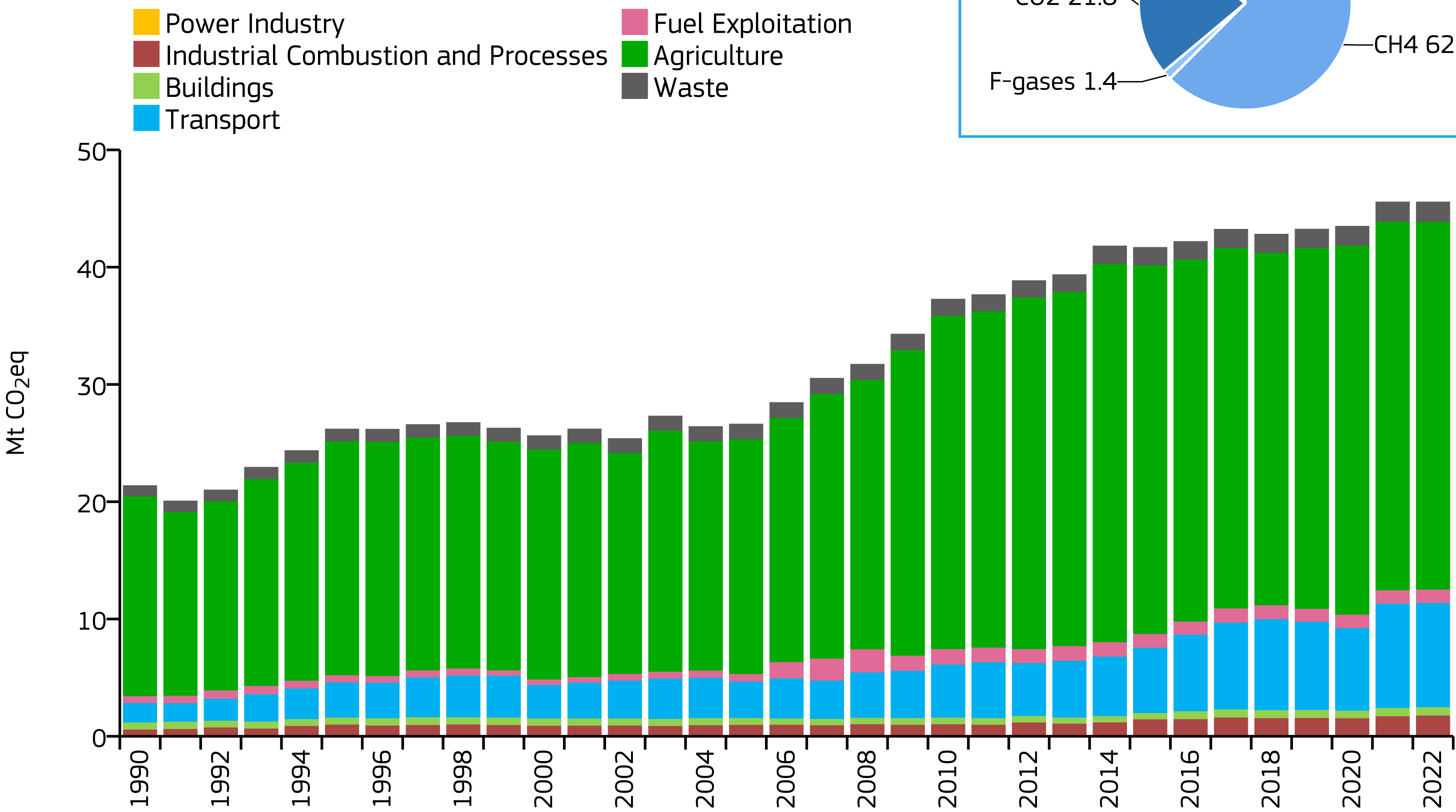
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	9.097	1.000	0.238	9.096M
2015	11.140	1.407	0.336	7.920M
2005	9.572	1.516	0.512	6.315M
1990	3.848	0.892	0.342	4.313M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+69%	-43%	0%
Industrial Combustion and Processes	> +300%	-27%	0%
Buildings	+46%	+71%	+1%
Transport	+162%	+17%	+3%
Fuel Exploitation	> +300%	-24%	-7%
Agriculture	+47%	+13%	+1%
Waste	+122%	+46%	+2%
All sectors	+136%	-5%	0%

Paraguay



GHG emissions by sector

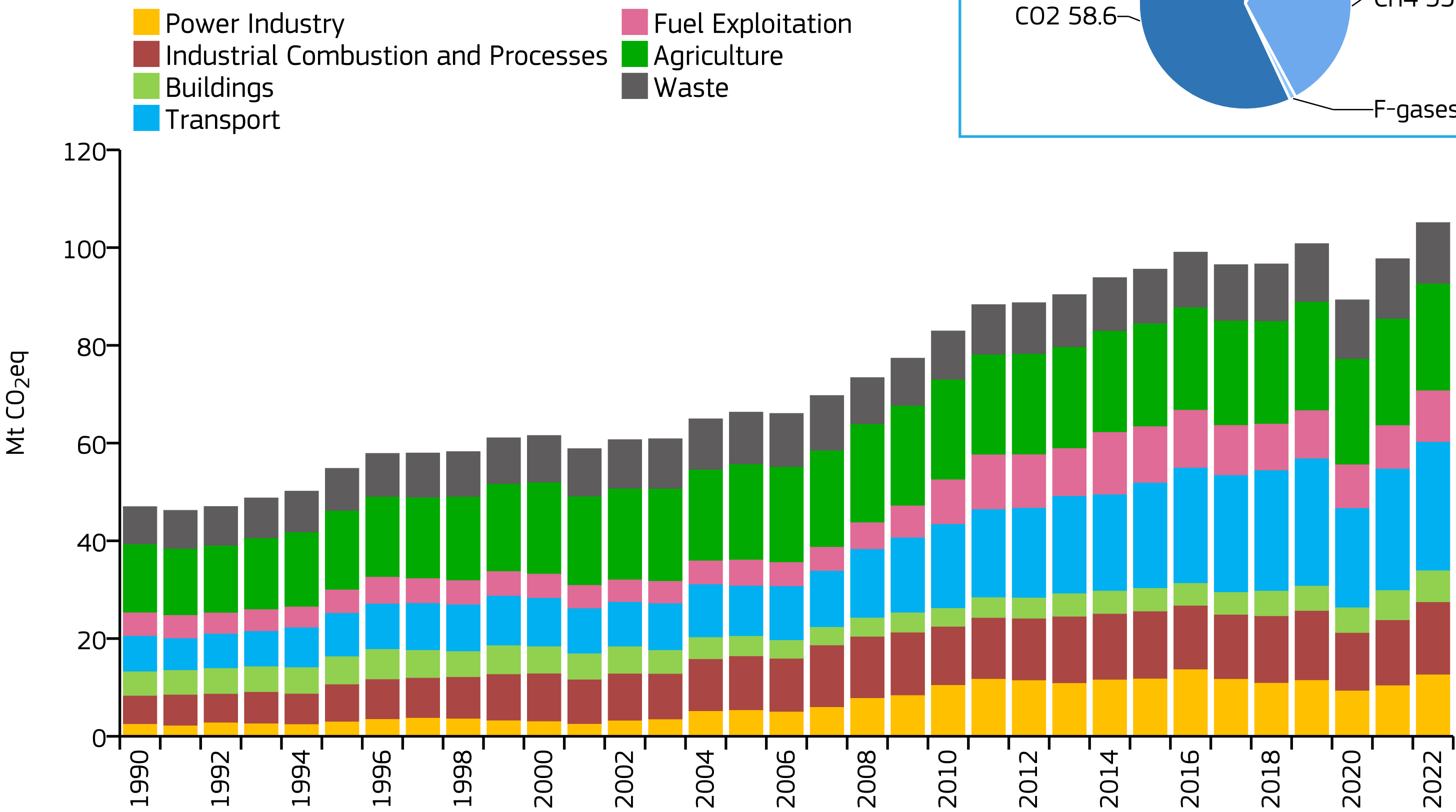


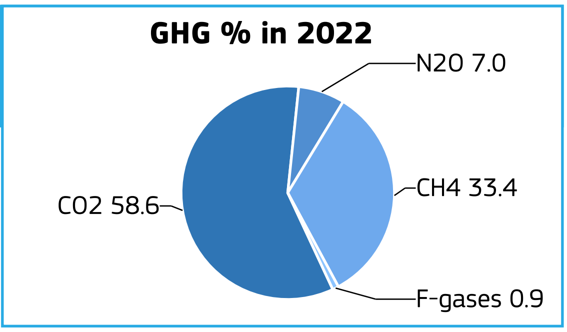
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.565	6.301	0.497	7.232M
2015	41.691	6.280	0.527	6.639M
2005	26.632	4.595	0.534	5.795M
1990	21.380	5.074	0.597	4.214M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-79%	n/a	0%
Industrial Combustion and Processes	+207%	+80%	+3%
Buildings	+18%	+23%	0%
Transport	> +300%	+185%	0%
Fuel Exploitation	+91%	+79%	0%
Agriculture	+84%	+57%	0%
Waste	+88%	+32%	+2%
All sectors	+113%	+71%	0%

Peru

GHG emissions by sector



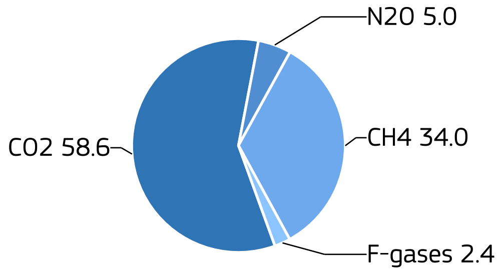


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	105.139	3.087	0.242	34.055M
2015	95.613	3.047	0.259	31.377M
2005	66.339	2.403	0.317	27.610M
1990	47.003	2.153	0.406	21.827M

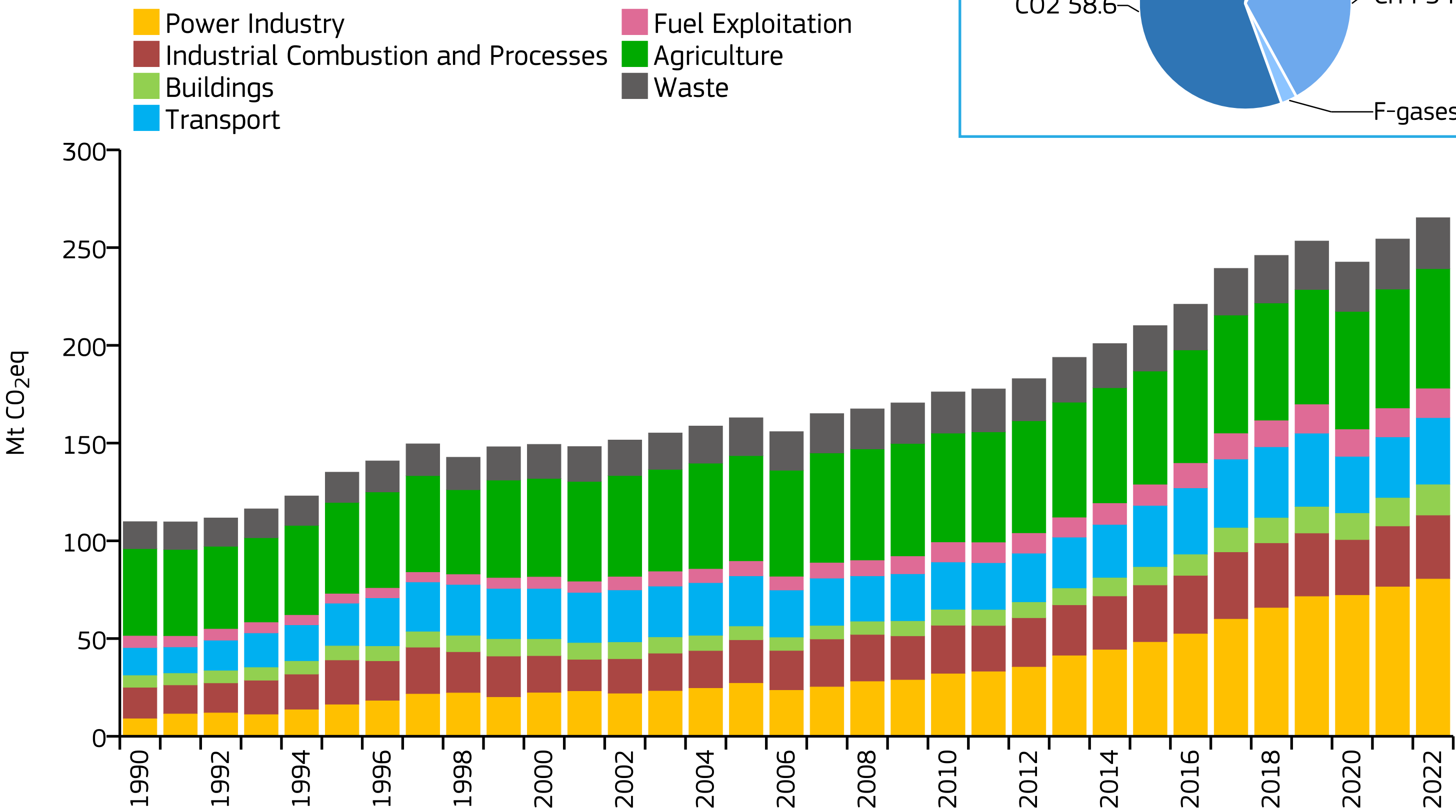
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+135%	+21%
Industrial Combustion and Processes	+156%	+34%	+11%
Buildings	+30%	+56%	+6%
Transport	+262%	+156%	+6%
Fuel Exploitation	+120%	+97%	+18%
Agriculture	+57%	+12%	0%
Waste	+62%	+17%	+2%
All sectors	+124%	+58%	+8%

Philippines

GHG % in 2022



GHG emissions by sector

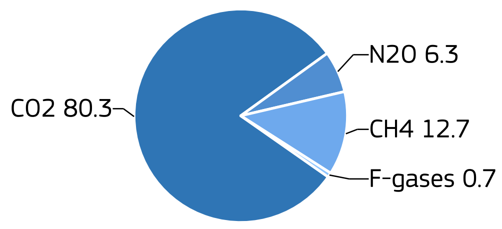


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	265.296	2.350	0.268	112.901M
2015	210.104	2.066	0.282	101.716M
2005	162.958	1.889	0.373	86.274M
1990	109.812	1.773	0.421	61.947M

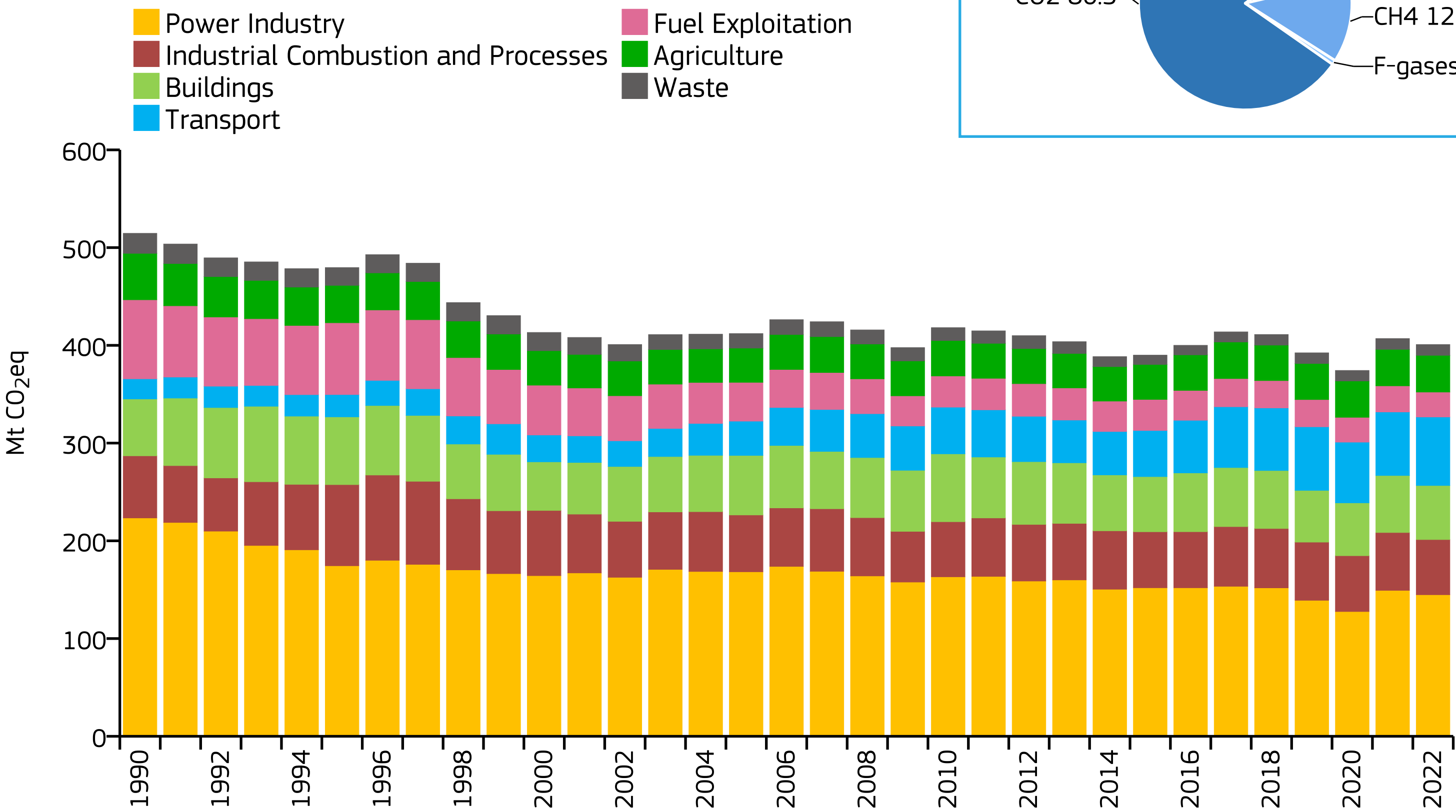
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+195%	+5%
Industrial Combustion and Processes	+105%	+48%	+5%
Buildings	+152%	+124%	+8%
Transport	+142%	+33%	+10%
Fuel Exploitation	+144%	+95%	+2%
Agriculture	+38%	+14%	+1%
Waste	+89%	+35%	+2%
All sectors	+142%	+63%	+4%

Poland

GHG % in 2022



GHG emissions by sector

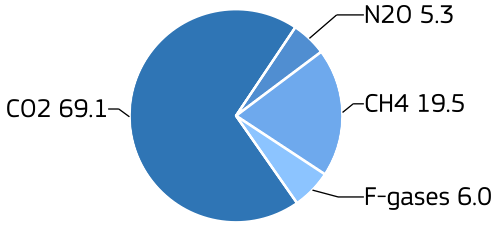


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	400.824	10.620	0.290	37.741M
2015	389.991	10.192	0.371	38.265M
2005	412.029	10.740	0.573	38.363M
1990	514.613	13.559	1.199	37.955M

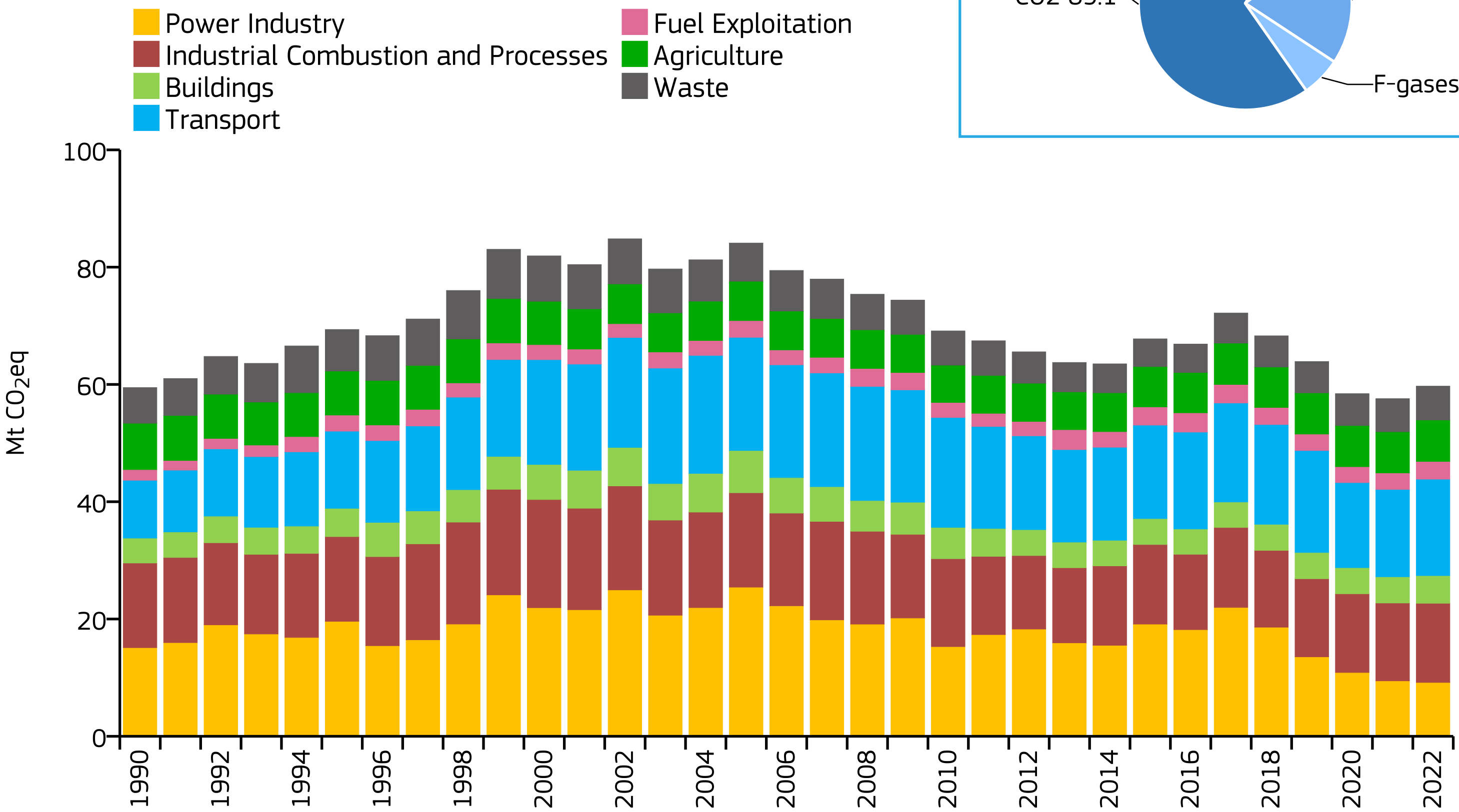
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-35%	-14%	-3%
Industrial Combustion and Processes	-11%	-3%	-5%
Buildings	-5%	-9%	-5%
Transport	+240%	+100%	+8%
Fuel Exploitation	-68%	-36%	-5%
Agriculture	-21%	+8%	+1%
Waste	-46%	-26%	0%
All sectors	-22%	-3%	-2%

Portugal

GHG % in 2022



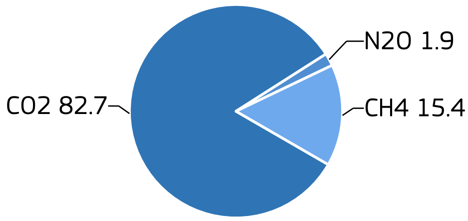
GHG emissions by sector



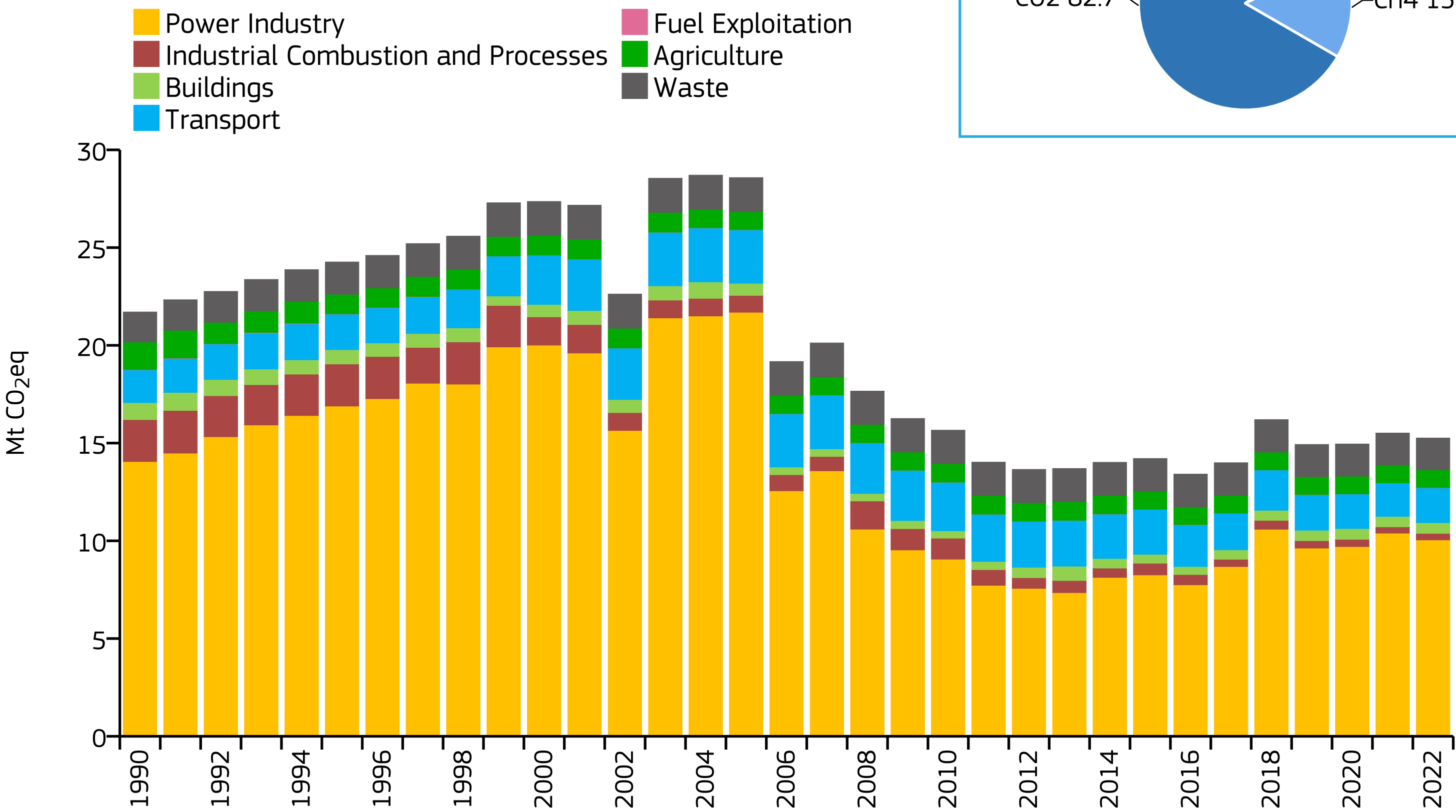
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	59.713	5.884	0.161	10.148M
2015	67.779	6.506	0.210	10.418M
2005	84.118	7.961	0.258	10.566M
1990	59.465	5.974	0.253	9.953M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-39%	-64%	-3%
Industrial Combustion and Processes	-6%	-16%	+2%
Buildings	+11%	-35%	+5%
Transport	+67%	-15%	+10%
Fuel Exploitation	+67%	+6%	+8%
Agriculture	-11%	+5%	+1%
Waste	-5%	-12%	+2%
All sectors	0%	-29%	+4%

Puerto Rico



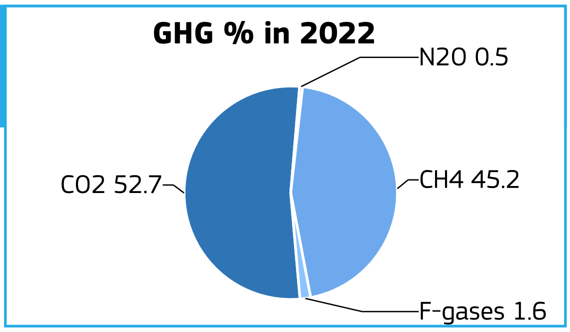
GHG emissions by sector



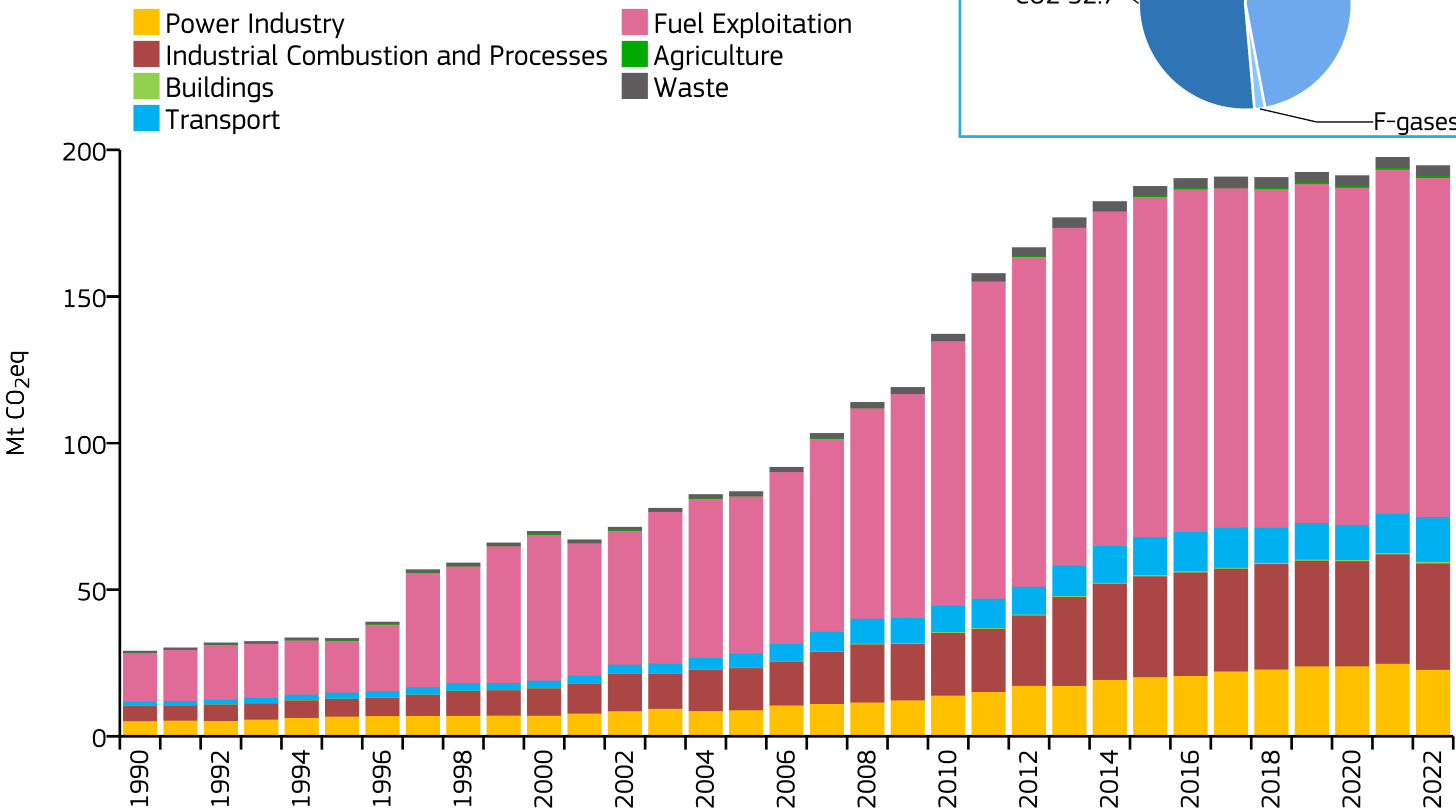
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	15.265	4.192	0.138	3.641M
2015	14.215	3.869	0.119	3.674M
2005	28.585	7.592	0.218	3.765M
1990	21.711	6.171	0.284	3.518M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-29%	-54%	-3%
Industrial Combustion and Processes	-84%	-61%	+4%
Buildings	-37%	-11%	+3%
Transport	+6%	-35%	+4%
Fuel Exploitation	-48%	+218%	-6%
Agriculture	-36%	-1%	0%
Waste	+6%	-7%	0%
All sectors	-30%	-47%	-2%

Qatar



GHG emissions by sector

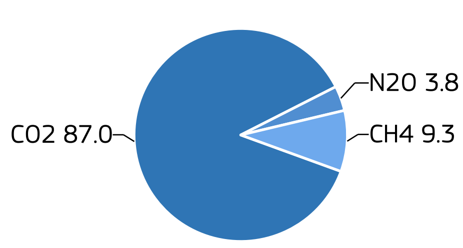


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	194.652	67.377	0.744	2.889M
2015	187.606	75.601	0.762	2.482M
2005	83.445	96.484	1.099	864.863k
1990	29.081	61.037	1.018	476.445k

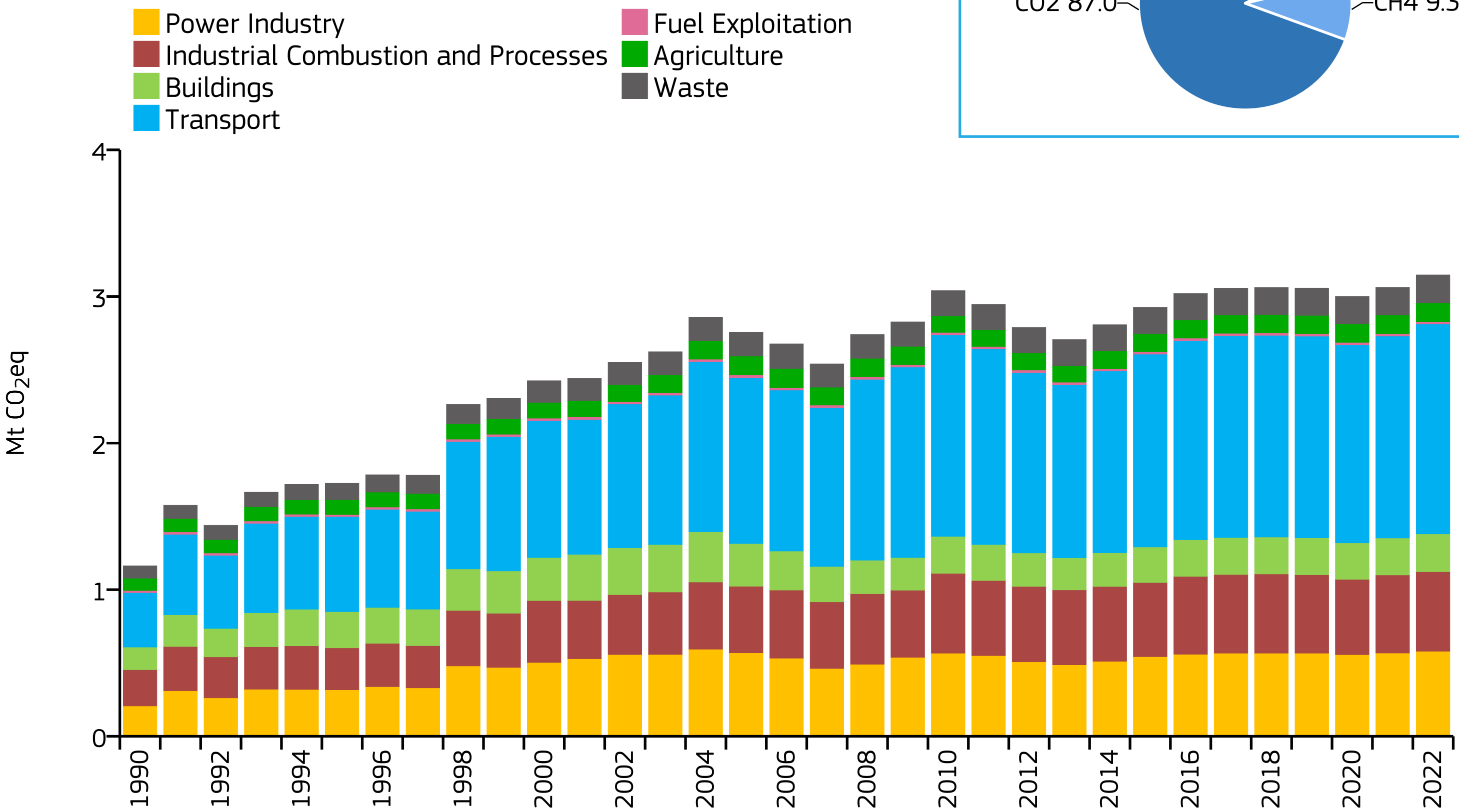
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+154%	-8%
Industrial Combustion and Processes	> +300%	+153%	-3%
Buildings	> +300%	+206%	+14%
Transport	> +300%	+218%	+14%
Fuel Exploitation	> +300%	+116%	-1%
Agriculture	> +300%	> +300%	+7%
Waste	> +300%	+141%	-2%
All sectors	> +300%	+133%	-1%

Réunion

GHG % in 2022



GHG emissions by sector

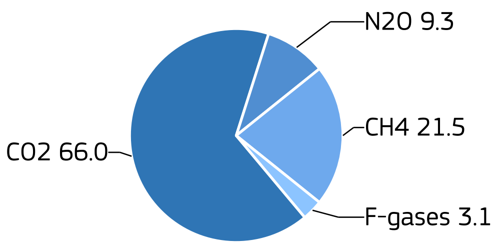


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	3.147	3.462	n/a	909.000k
2015	2.926	3.389	n/a	863.363k
2005	2.757	3.483	n/a	791.598k
1990	1.163	1.905	n/a	610.582k

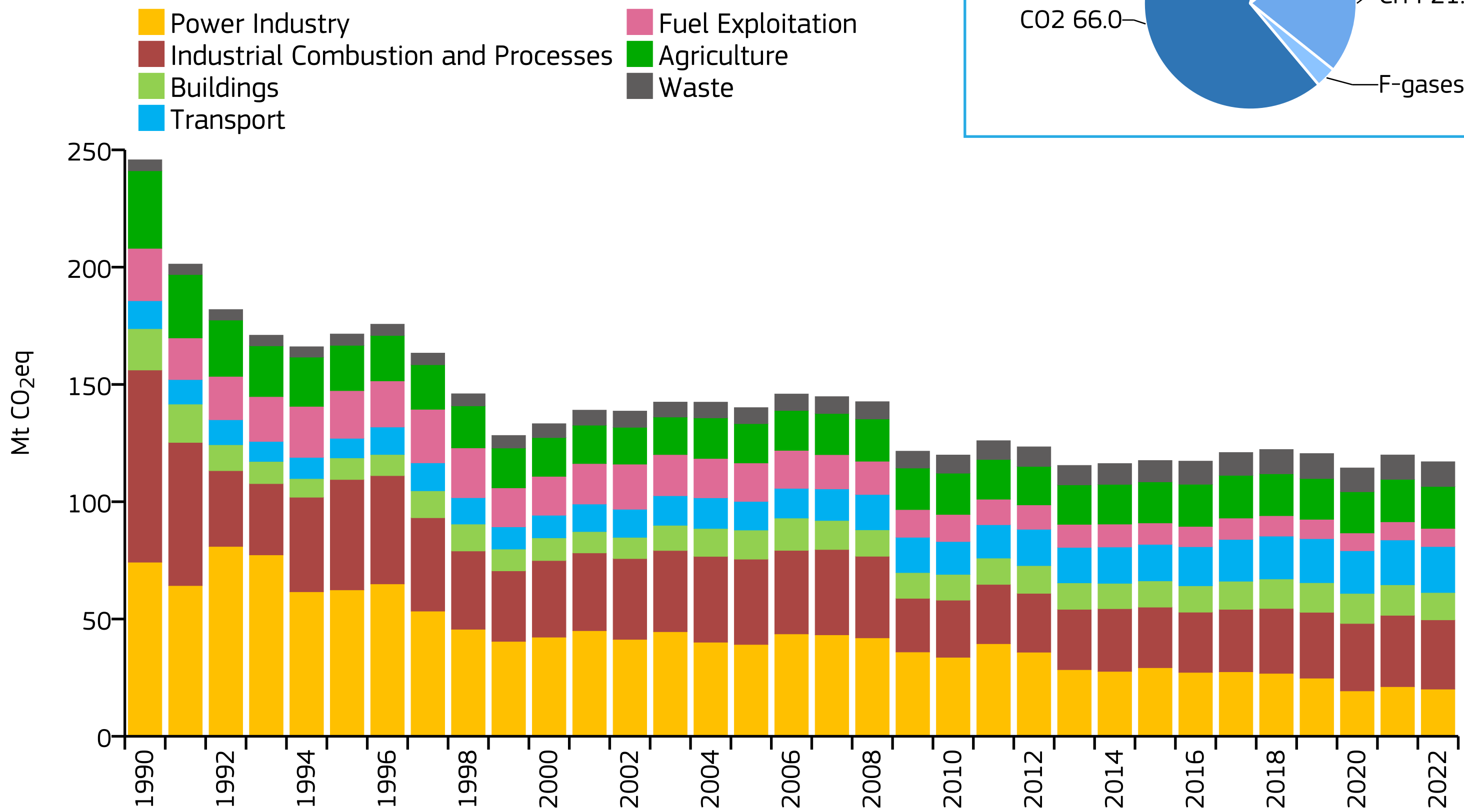
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+181%	+2%	+2%
Industrial Combustion and Processes	+119%	+19%	+2%
Buildings	+67%	-12%	+2%
Transport	+286%	+27%	+4%
Fuel Exploitation	+8%	-4%	0%
Agriculture	+53%	-1%	+1%
Waste	+125%	+16%	+1%
All sectors	+171%	+14%	+3%

Romania

GHG % in 2022



GHG emissions by sector

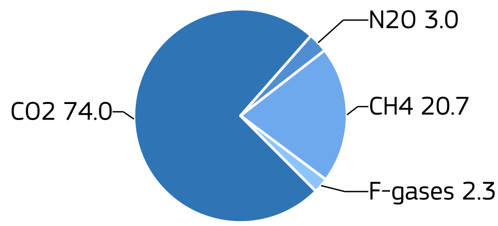


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	117.061	6.096	0.189	19.202M
2015	117.596	5.916	0.248	19.877M
2005	140.123	6.538	0.390	21.431M
1990	245.774	10.463	0.792	23.489M

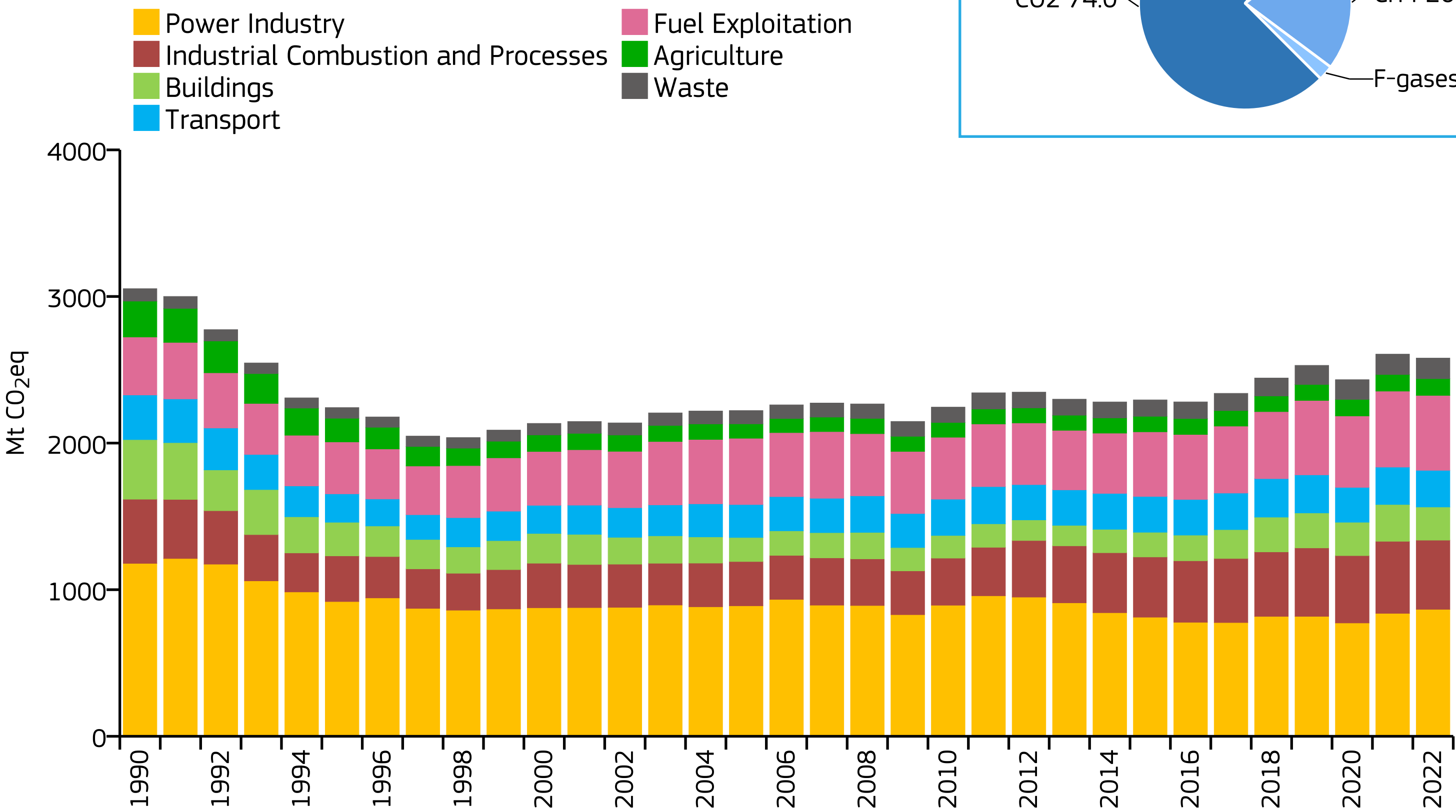
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-73%	-49%	-5%
Industrial Combustion and Processes	-64%	-19%	-3%
Buildings	-34%	-6%	-11%
Transport	+64%	+61%	+3%
Fuel Exploitation	-65%	-53%	0%
Agriculture	-46%	+7%	-1%
Waste	+125%	+54%	+2%
All sectors	-52%	-16%	-2%

Russia

GHG % in 2022



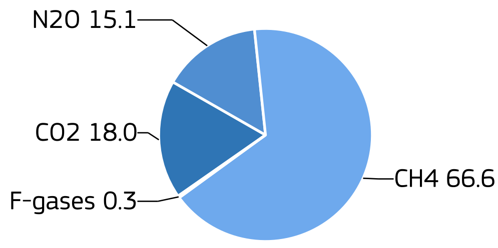
GHG emissions by sector



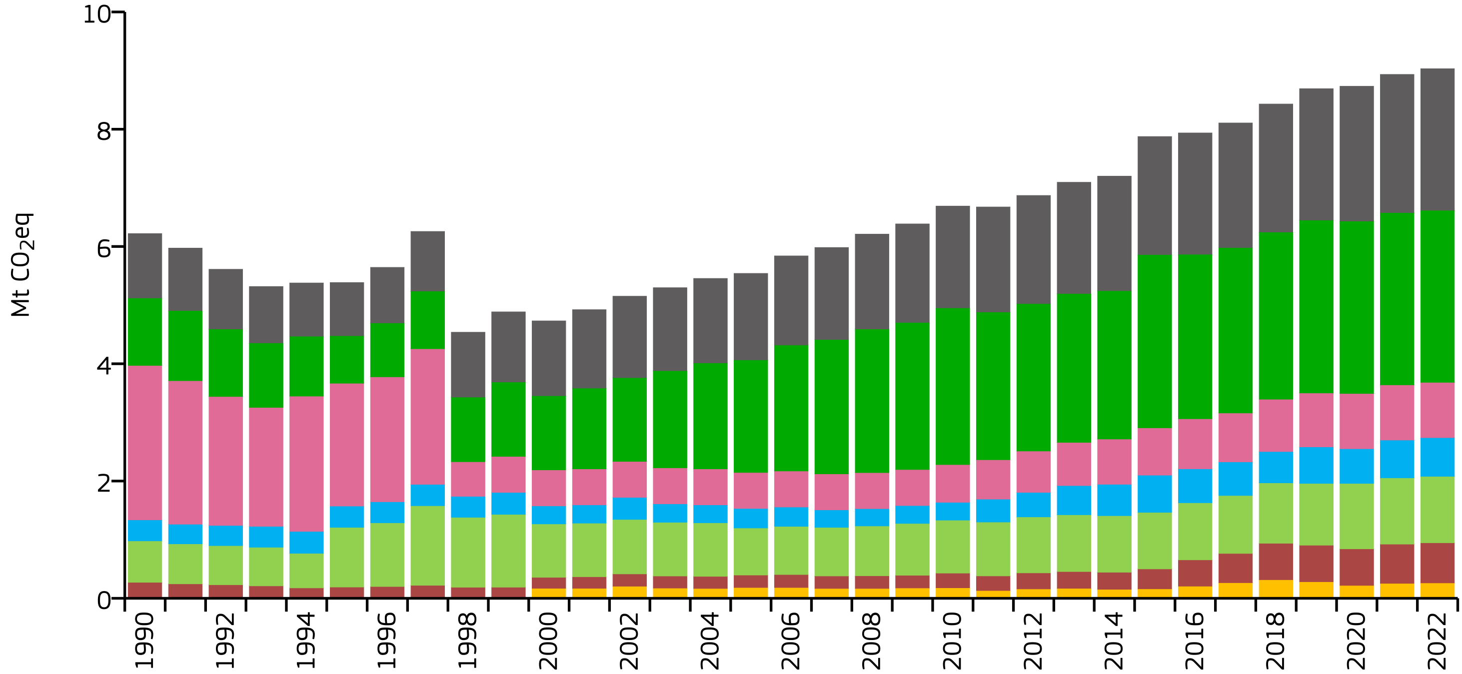
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2579.798	17.985	0.641	143.441M
2015	2294.777	15.948	0.615	143.888M
2005	2221.773	15.470	0.772	143.618M
1990	3053.150	20.690	0.960	147.564M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-27%	-3%	+3%
Industrial Combustion and Processes	+8%	+56%	-4%
Buildings	-44%	+38%	-10%
Transport	-18%	+12%	-2%
Fuel Exploitation	+29%	+13%	-1%
Agriculture	-53%	+16%	0%
Waste	+65%	+55%	+1%
All sectors	-16%	+16%	-1%

Rwanda



GHG emissions by sector

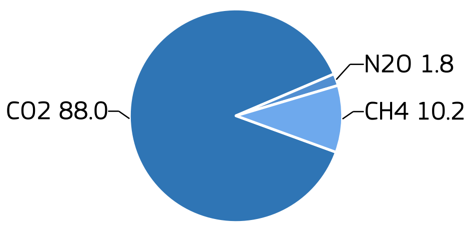


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	9.032	0.661	0.277	13.669M
2015	7.875	0.677	0.367	11.630M
2005	5.541	0.616	0.546	8.992M
1990	6.220	0.860	0.911	7.236M

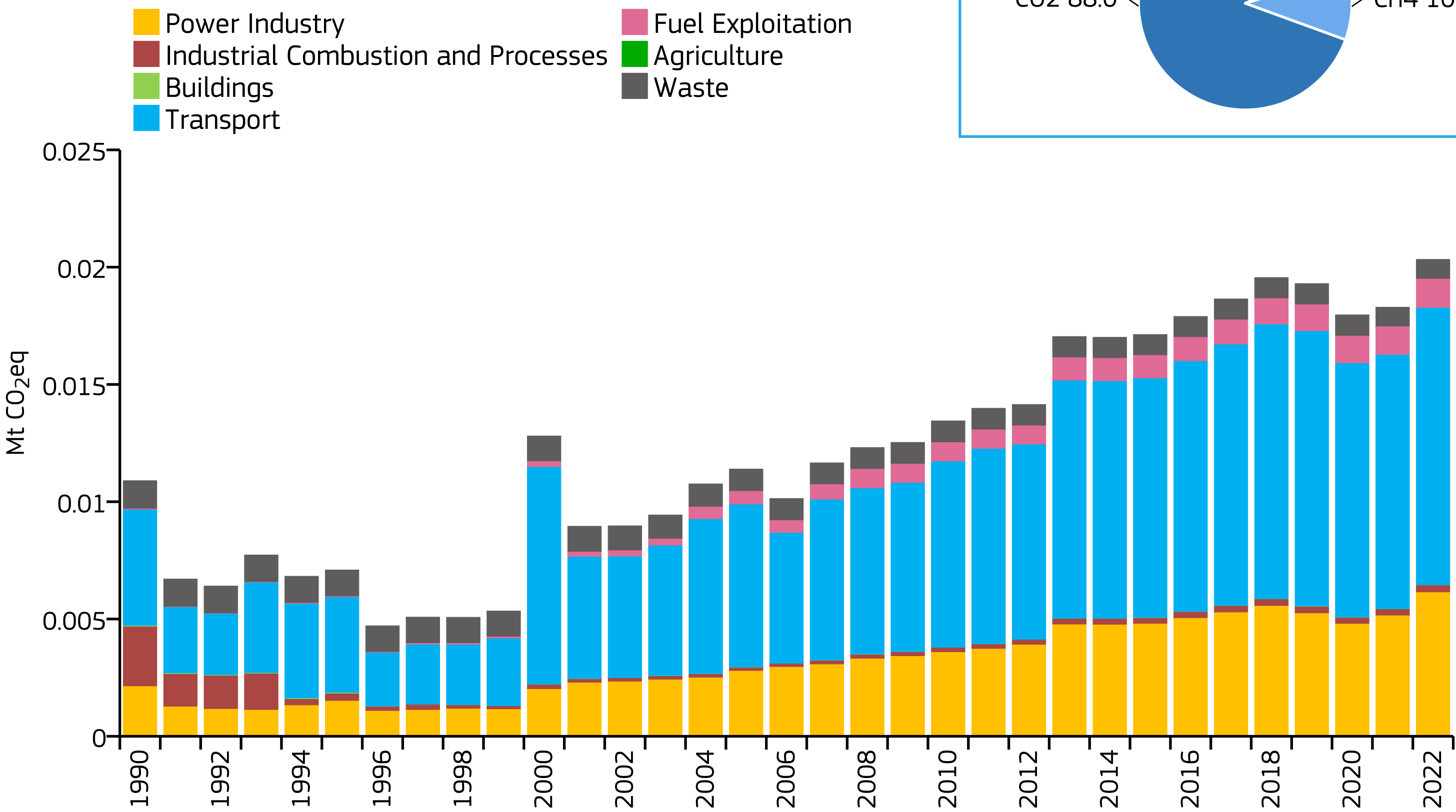
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	n/a	+42%	+3%
Industrial Combustion and Processes	+152%	+223%	+2%
Buildings	+60%	+41%	0%
Transport	+84%	+98%	+2%
Fuel Exploitation	-64%	+54%	0%
Agriculture	+155%	+53%	0%
Waste	+120%	+64%	+2%
All sectors	+45%	+63%	+1%

Saint Helena, Ascension and Tristan

GHG % in 2022



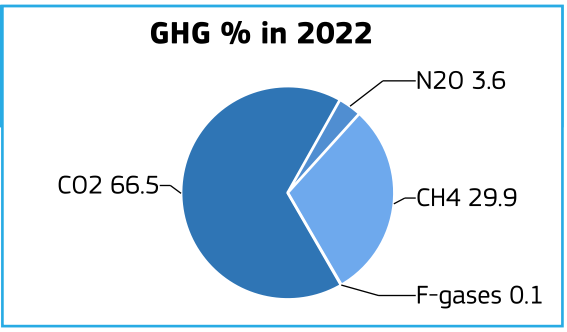
GHG emissions by sector



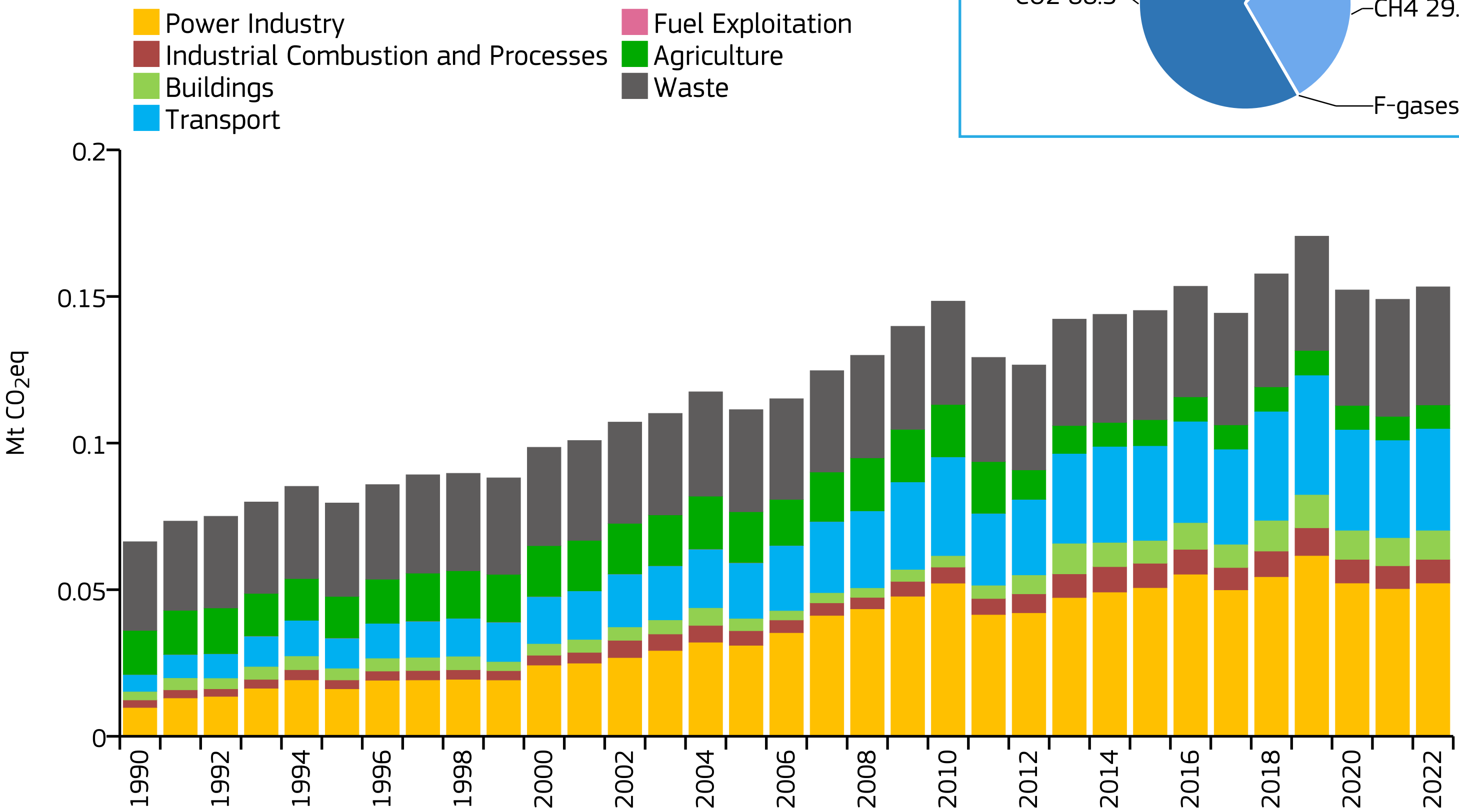
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.020	5.084	n/a	4.000k
2015	0.017	4.247	n/a	4.034k
2005	0.011	2.666	n/a	4.275k
1990	0.011	1.969	n/a	5.535k

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+187%	+120%	+19%
Industrial Combustion and Processes	-88%	+102%	+11%
Buildings	-91%	+24%	+11%
Transport	+139%	+70%	+9%
Fuel Exploitation	> +300%	+117%	+3%
Agriculture	n/a	n/a	n/a
Waste	-31%	-12%	0%
All sectors	+87%	+78%	+11%

Saint Kitts and Nevis



GHG emissions by sector

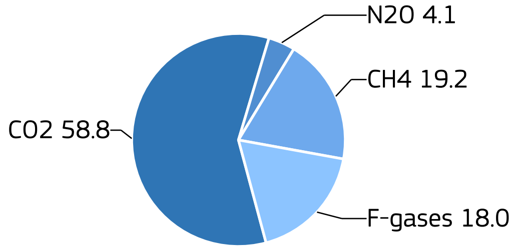


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.153	2.643	0.112	58.000k
2015	0.145	2.675	0.108	54.288k
2005	0.111	2.292	0.107	48.611k
1990	0.066	1.625	0.115	40.834k

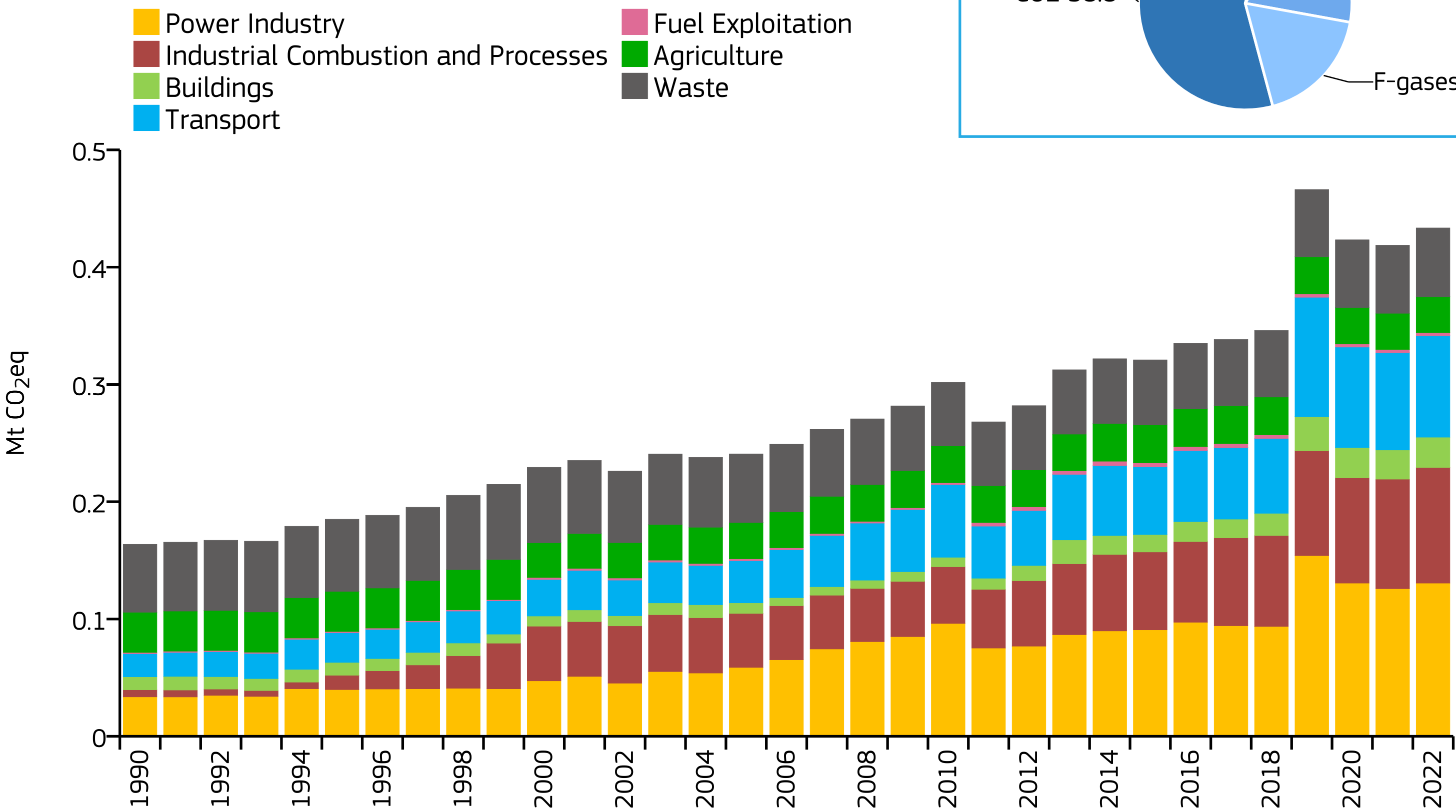
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+68%	+4%
Industrial Combustion and Processes	+214%	+61%	+3%
Buildings	+241%	+136%	+4%
Transport	> +300%	+83%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	-46%	-54%	-1%
Waste	+33%	+16%	+1%
All sectors	+131%	+38%	+3%

Saint Lucia

GHG % in 2022



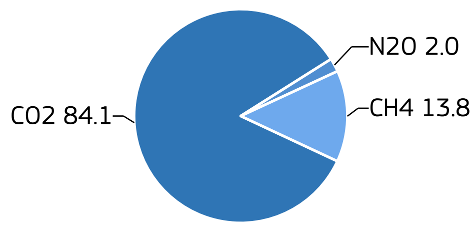
GHG emissions by sector



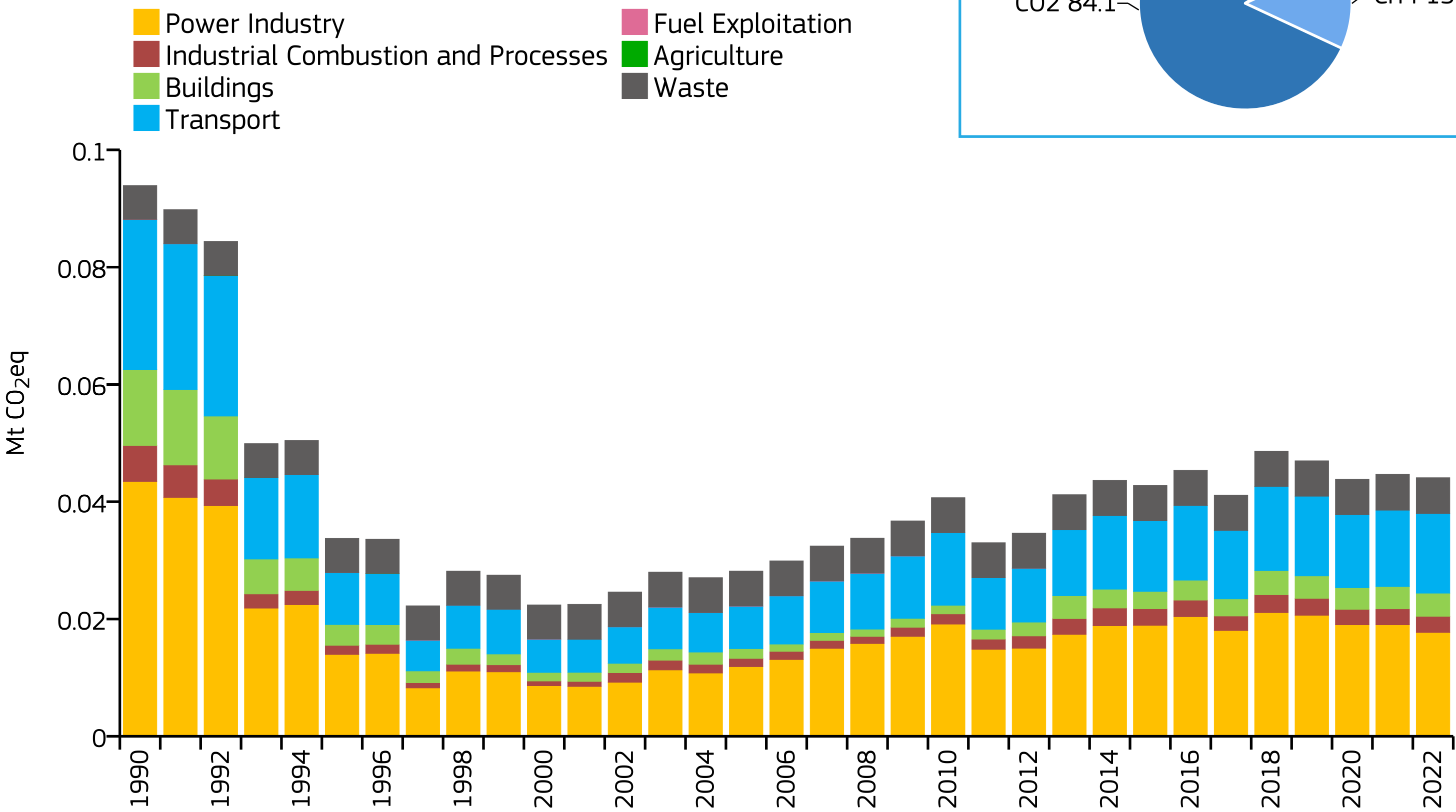
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.433	2.369	0.160	183.000k
2015	0.321	1.811	0.127	177.206k
2005	0.241	1.471	0.109	163.714k
1990	0.164	1.184	0.101	138.185k

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+289%	+122%	+4%
Industrial Combustion and Processes	> +300%	+114%	+6%
Buildings	+133%	+188%	+4%
Transport	> +300%	+141%	+4%
Fuel Exploitation	+136%	+64%	0%
Agriculture	-11%	-2%	-1%
Waste	+1%	0%	+1%
All sectors	+165%	+80%	+4%

Saint Pierre and Miquelon



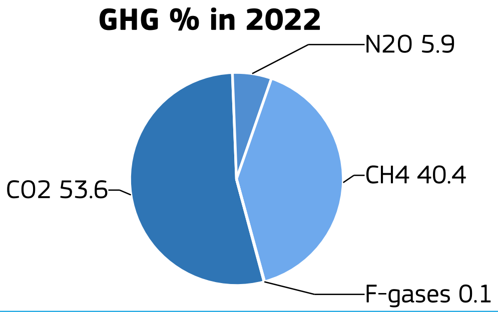
GHG emissions by sector



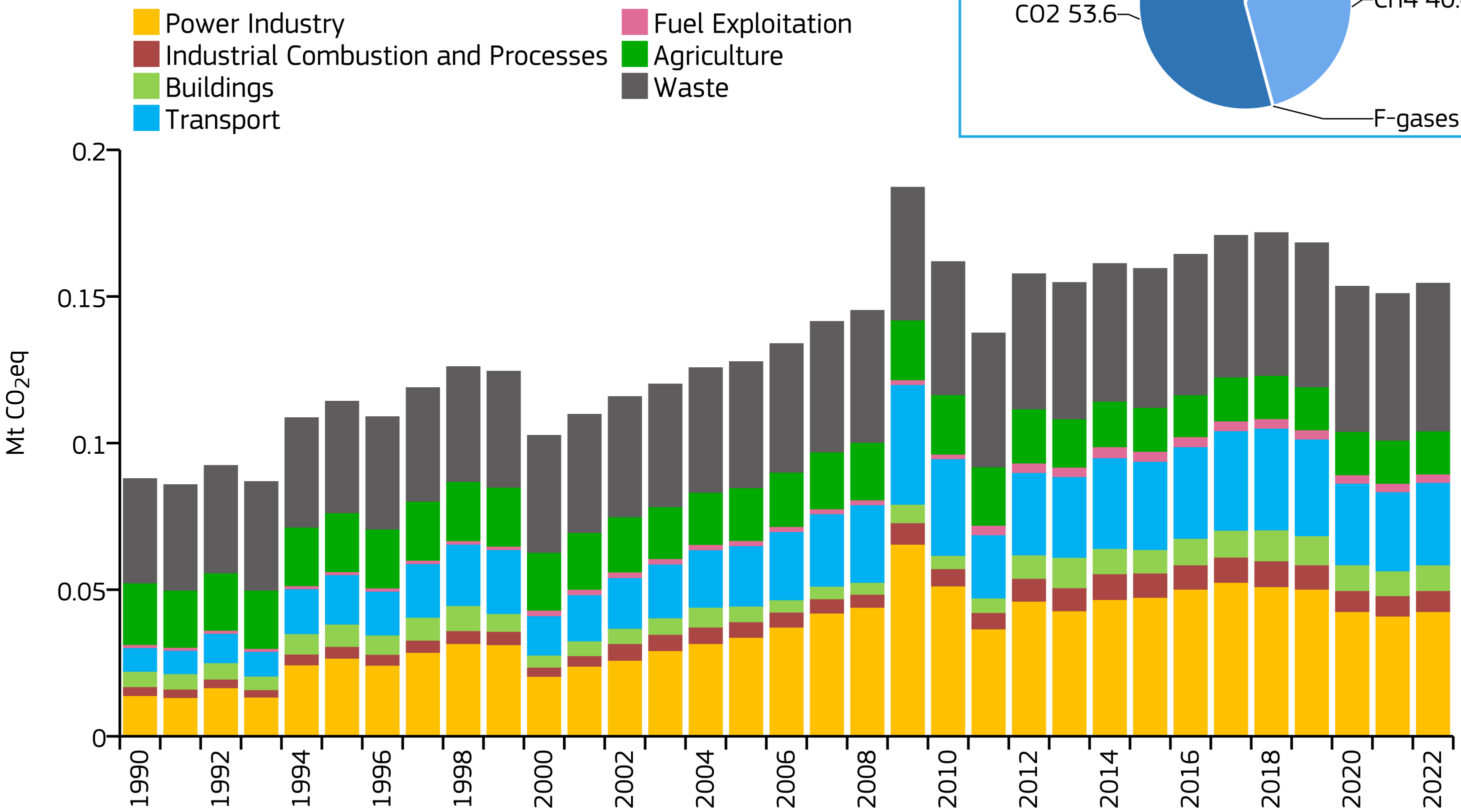
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.044	6.301	n/a	7.000k
2015	0.043	6.799	n/a	6.290k
2005	0.028	4.504	n/a	6.261k
1990	0.094	14.968	n/a	6.276k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-59%	+49%	-7%
Industrial Combustion and Processes	-55%	+98%	+2%
Buildings	-70%	+137%	+4%
Transport	-47%	+86%	+4%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+6%	+2%	0%
All sectors	-53%	+56%	-1%

Saint Vincent and the Grenadines



GHG emissions by sector

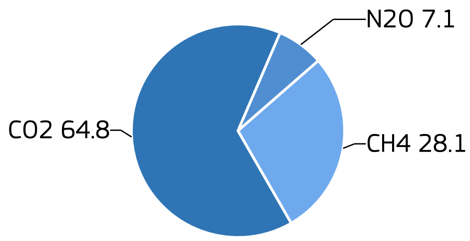


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.155	1.393	0.102	111.000k
2015	0.160	1.458	0.118	109.455k
2005	0.128	1.175	0.106	108.744k
1990	0.088	0.818	0.121	107.505k

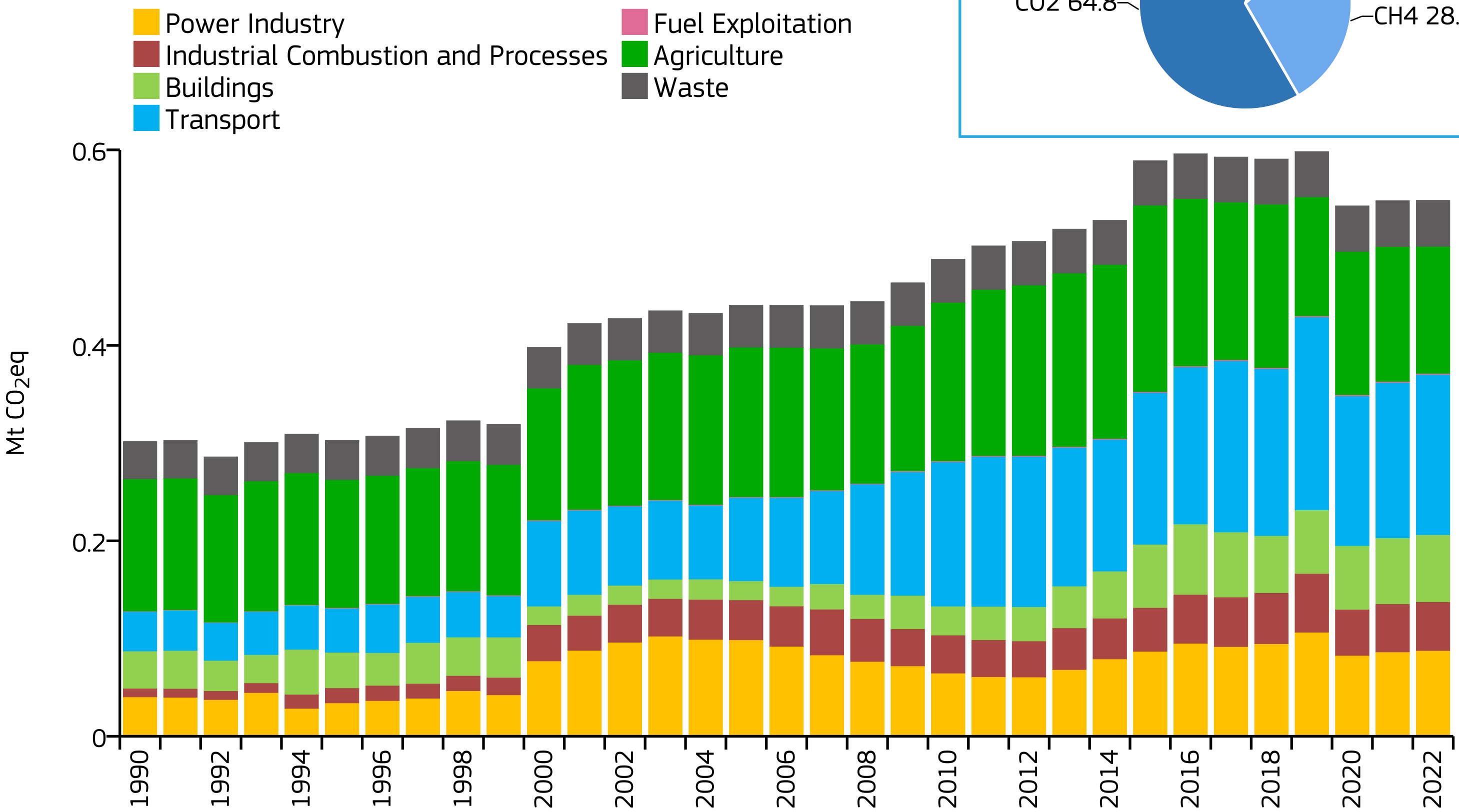
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+207%	+26%	+4%
Industrial Combustion and Processes	+136%	+34%	+3%
Buildings	+68%	+64%	+3%
Transport	+248%	+37%	+4%
Fuel Exploitation	+164%	+61%	0%
Agriculture	-30%	-18%	0%
Waste	+42%	+17%	+1%
All sectors	+76%	+21%	+2%

Samoa

GHG % in 2022



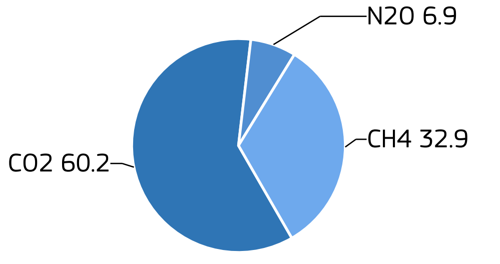
GHG emissions by sector



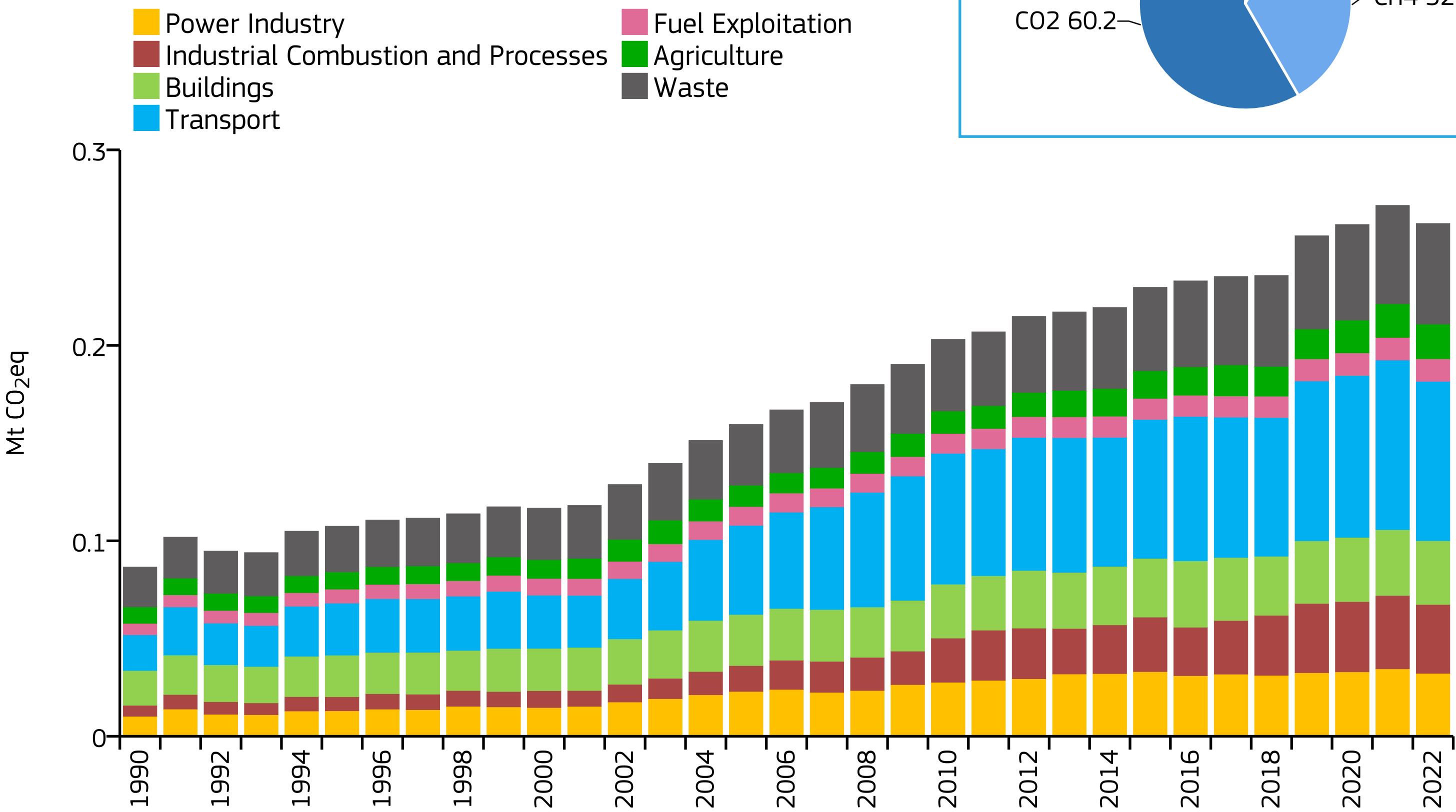
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.548	2.702	0.482	203.000k
2015	0.589	3.039	0.498	193.759k
2005	0.441	2.452	0.438	179.929k
1990	0.302	1.853	0.491	162.866k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+118%	-11%	+2%
Industrial Combustion and Processes	> +300%	+22%	+2%
Buildings	+80%	+252%	+2%
Transport	> +300%	+92%	+3%
Fuel Exploitation	+156%	+45%	0%
Agriculture	-4%	-15%	-6%
Waste	+23%	+10%	0%
All sectors	+82%	+24%	0%

São Tomé and Príncipe



GHG emissions by sector

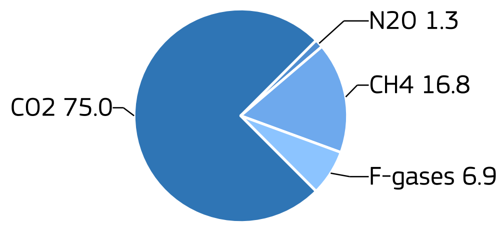


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.262	1.156	0.288	227.000k
2015	0.230	1.175	0.304	195.553k
2005	0.159	1.025	0.345	155.630k
1990	0.087	0.761	0.361	113.893k

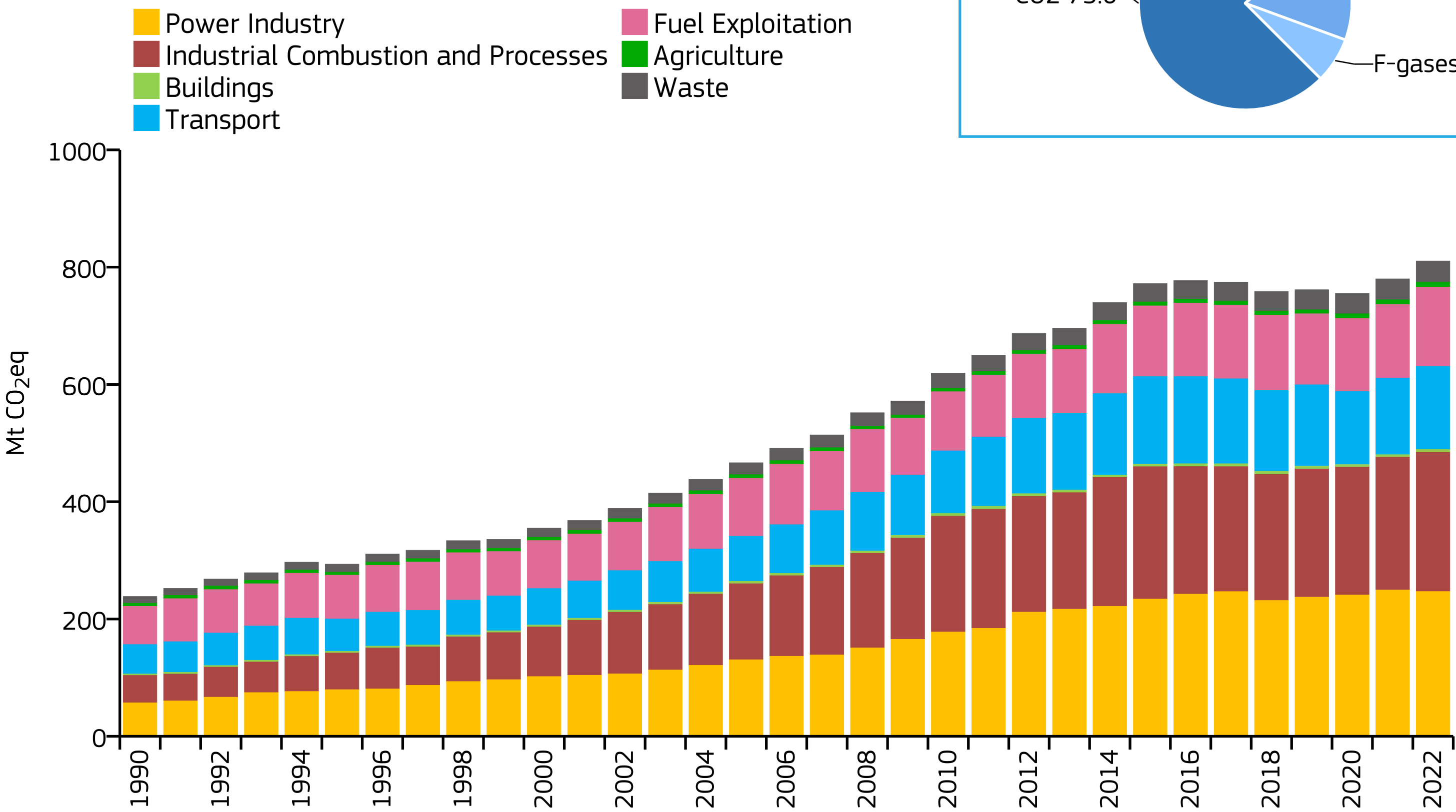
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+215%	+40%	-7%
Industrial Combustion and Processes	> +300%	+167%	-6%
Buildings	+84%	+25%	-3%
Transport	> +300%	+79%	-6%
Fuel Exploitation	+96%	+20%	0%
Agriculture	+112%	+63%	+3%
Waste	+152%	+66%	+2%
All sectors	+203%	+64%	-3%

Saudi Arabia

GHG % in 2022



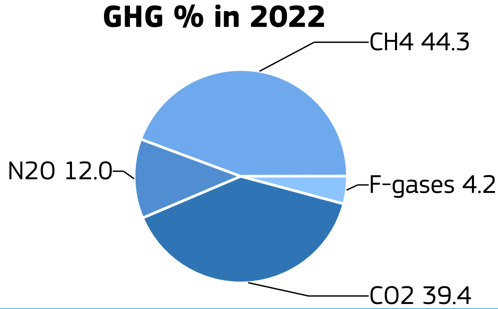
GHG emissions by sector



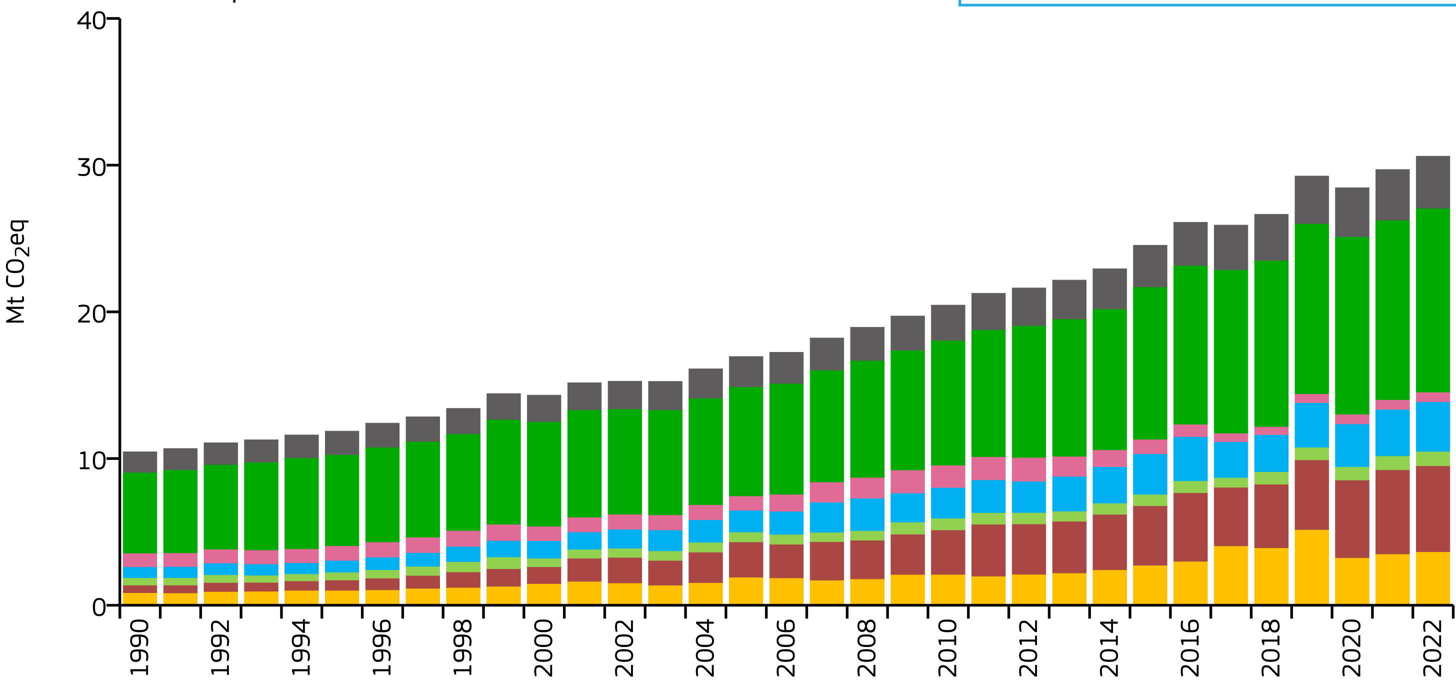
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	810.512	22.643	0.445	35.796M
2015	771.904	24.461	0.486	31.557M
2005	466.494	19.514	0.440	23.906M
1990	238.391	14.601	0.353	16.327M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+88%	-1%
Industrial Combustion and Processes	> +300%	+83%	+5%
Buildings	+82%	+14%	+8%
Transport	+183%	+84%	+9%
Fuel Exploitation	+108%	+37%	+8%
Agriculture	+52%	+33%	+3%
Waste	+235%	+82%	+2%
All sectors	+240%	+74%	+4%

Senegal



GHG emissions by sector

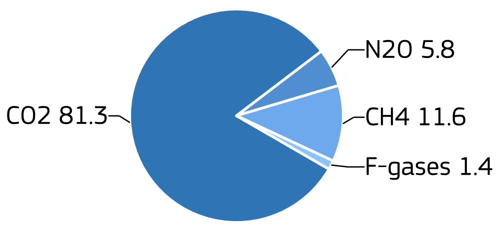


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	30.615	1.688	0.496	18.132M
2015	24.542	1.639	0.568	14.977M
2005	16.956	1.507	0.554	11.251M
1990	10.462	1.385	0.562	7.556M

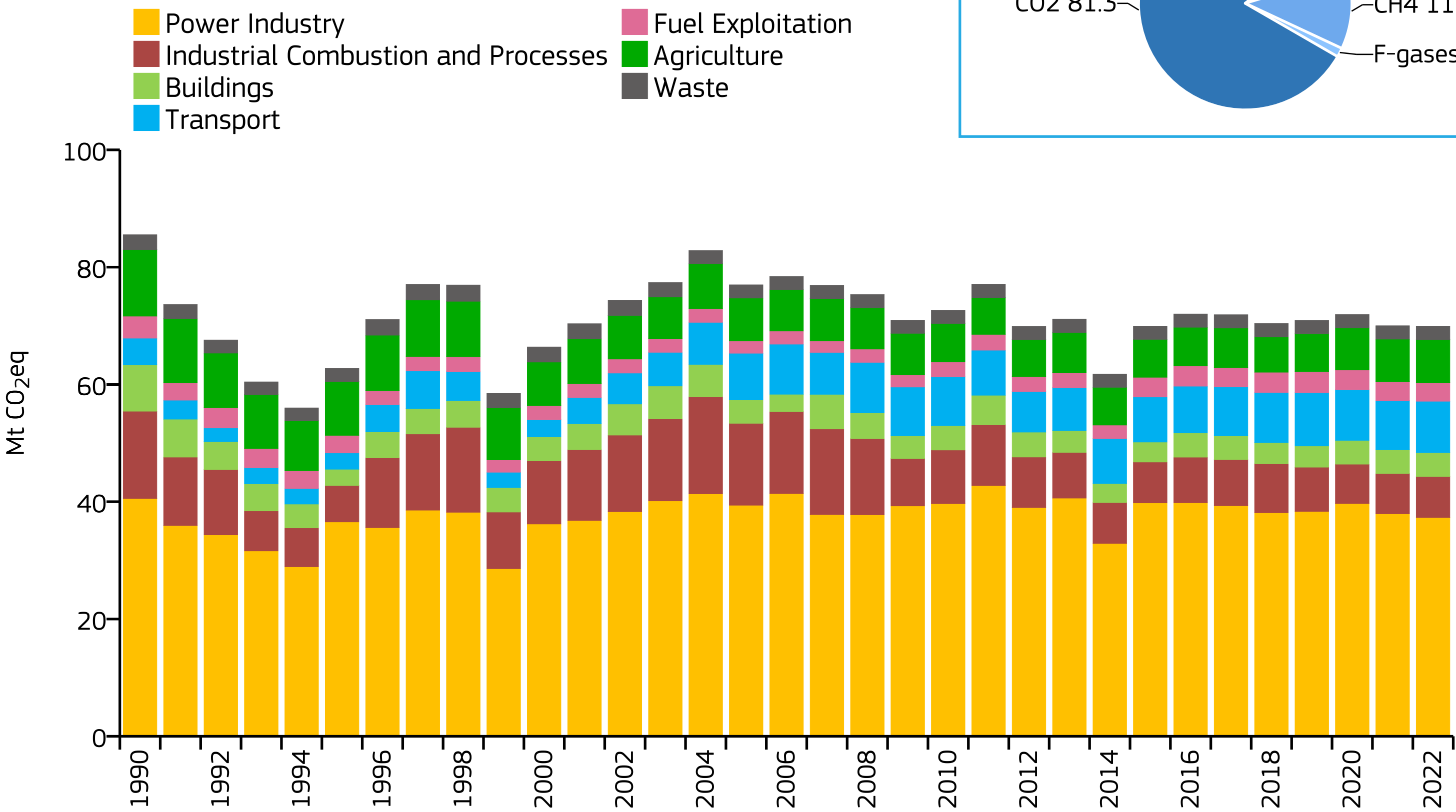
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+90%	+4%
Industrial Combustion and Processes	> +300%	+144%	+2%
Buildings	+94%	+45%	+3%
Transport	> +300%	+128%	+7%
Fuel Exploitation	-29%	-32%	0%
Agriculture	+128%	+68%	+2%
Waste	+153%	+72%	+3%
All sectors	+193%	+81%	+3%

Serbia and Montenegro

GHG % in 2022



GHG emissions by sector

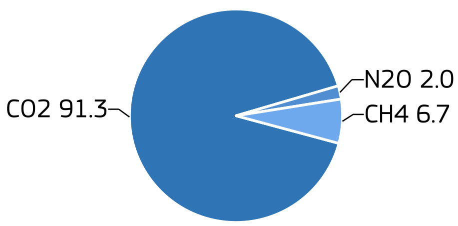


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	69.945	7.544	0.402	9.271M
2015	69.943	7.379	0.504	9.479M
2005	76.988	7.831	0.770	9.831M
1990	85.526	8.441	1.073	10.132M

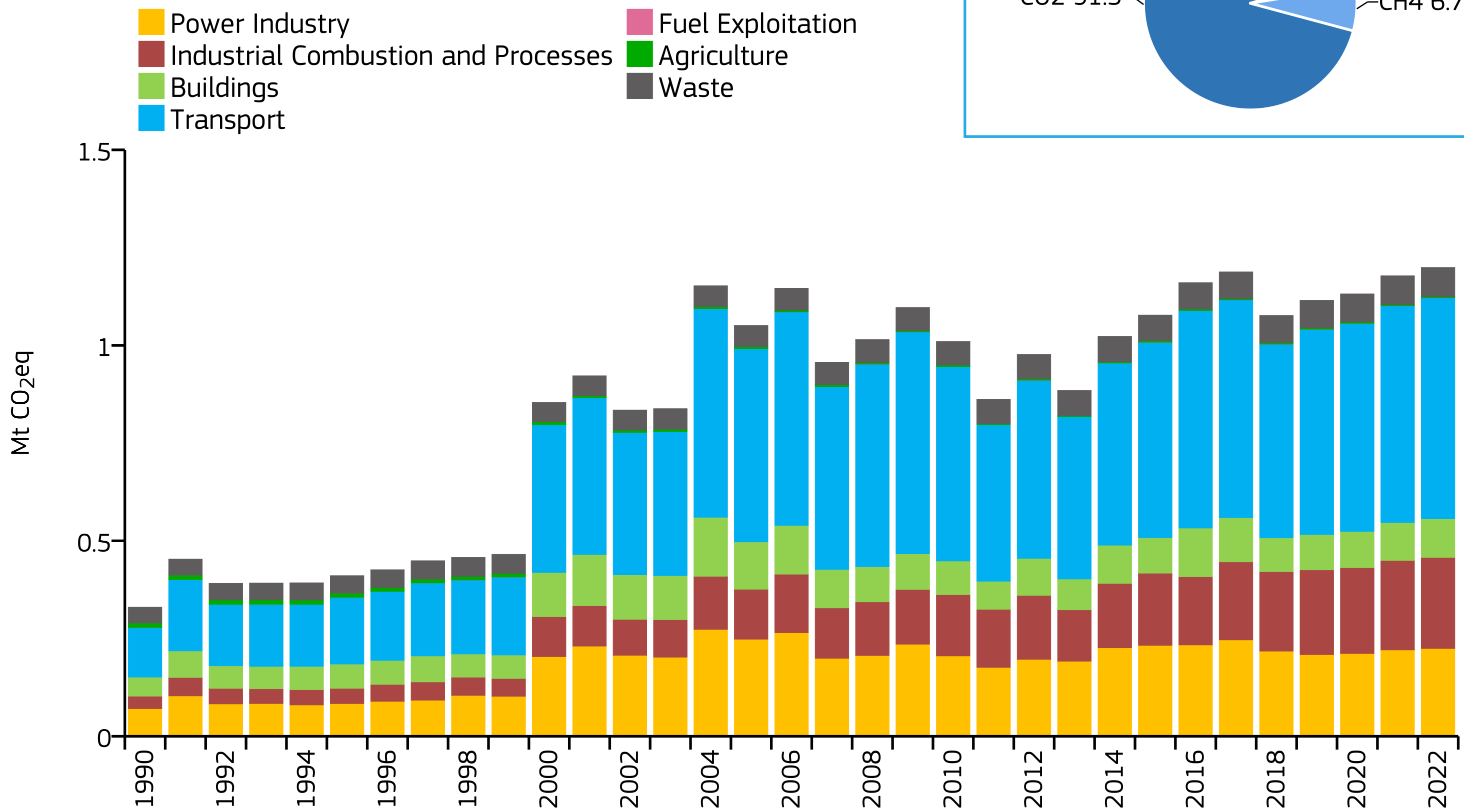
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-8%	-5%	-2%
Industrial Combustion and Processes	-53%	-50%	+2%
Buildings	-49%	+2%	0%
Transport	+93%	+10%	+4%
Fuel Exploitation	-15%	+53%	-1%
Agriculture	-36%	0%	+1%
Waste	-9%	+1%	0%
All sectors	-18%	-9%	0%

Seychelles

GHG % in 2022



GHG emissions by sector



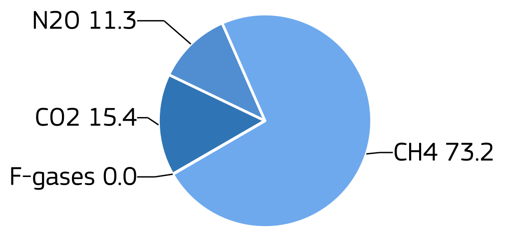
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	1.199	12.365	0.402	97.000k
2015	1.078	11.497	0.444	93.742k
2005	1.051	11.843	0.634	88.744k
1990	0.330	4.678	0.306	70.624k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+218%	-10%	+2%
Industrial Combustion and Processes	> +300%	+82%	+2%
Buildings	+102%	-18%	+2%
Transport	> +300%	+14%	+2%
Fuel Exploitation	-50%	-52%	+3%
Agriculture	-72%	-36%	-1%
Waste	+83%	+36%	+1%
All sectors	+263%	+14%	+2%

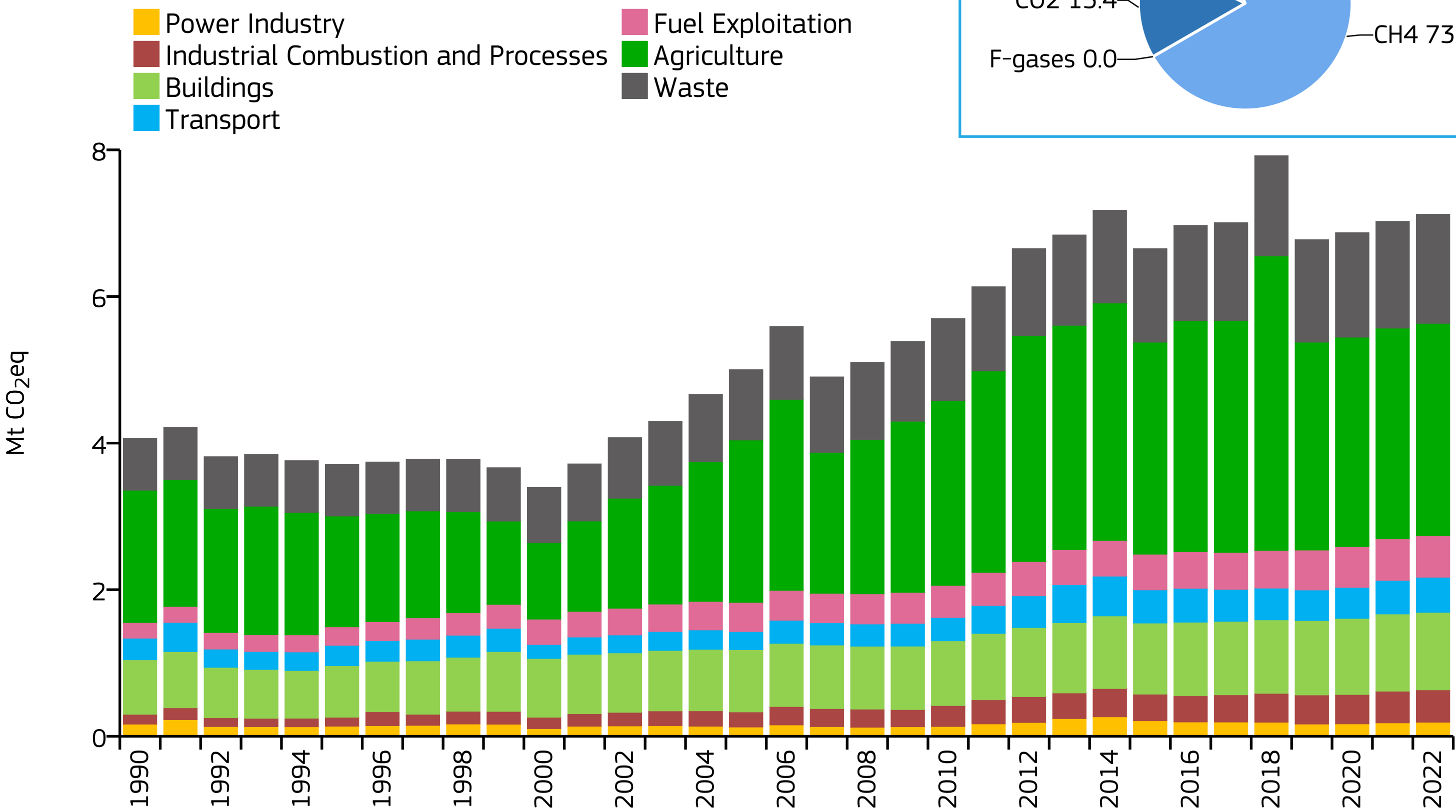
EDGAR

Sierra Leone

GHG % in 2022



GHG emissions by sector

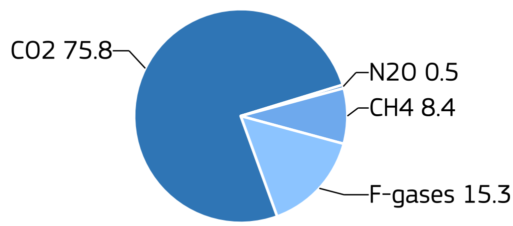


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	7.123	0.850	0.506	8.376M
2015	6.653	0.919	0.600	7.237M
2005	5.002	0.884	0.725	5.658M
1990	4.069	0.944	0.656	4.312M

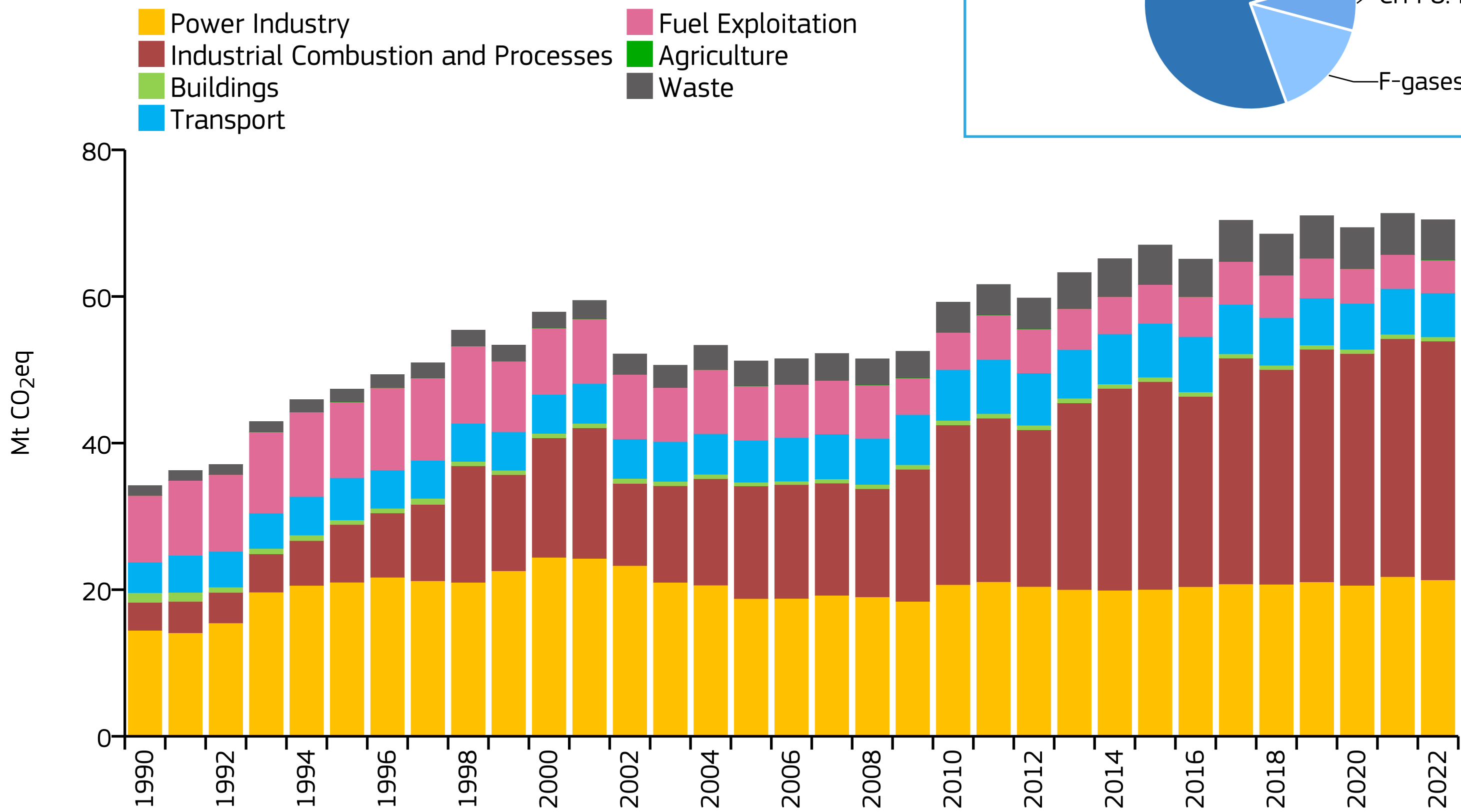
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+15%	+52%	+5%
Industrial Combustion and Processes	+231%	+115%	+2%
Buildings	+42%	+25%	0%
Transport	+62%	+94%	+5%
Fuel Exploitation	+166%	+42%	0%
Agriculture	+60%	+31%	+1%
Waste	+109%	+55%	+2%
All sectors	+75%	+42%	+1%

Singapore

GHG % in 2022



GHG emissions by sector

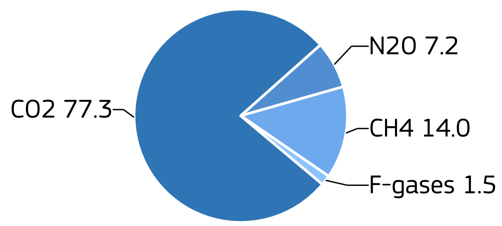


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	70.470	11.667	0.116	6.040M
2015	67.030	12.110	0.136	5.535M
2005	51.214	11.404	0.179	4.491M
1990	34.203	11.352	0.301	3.013M

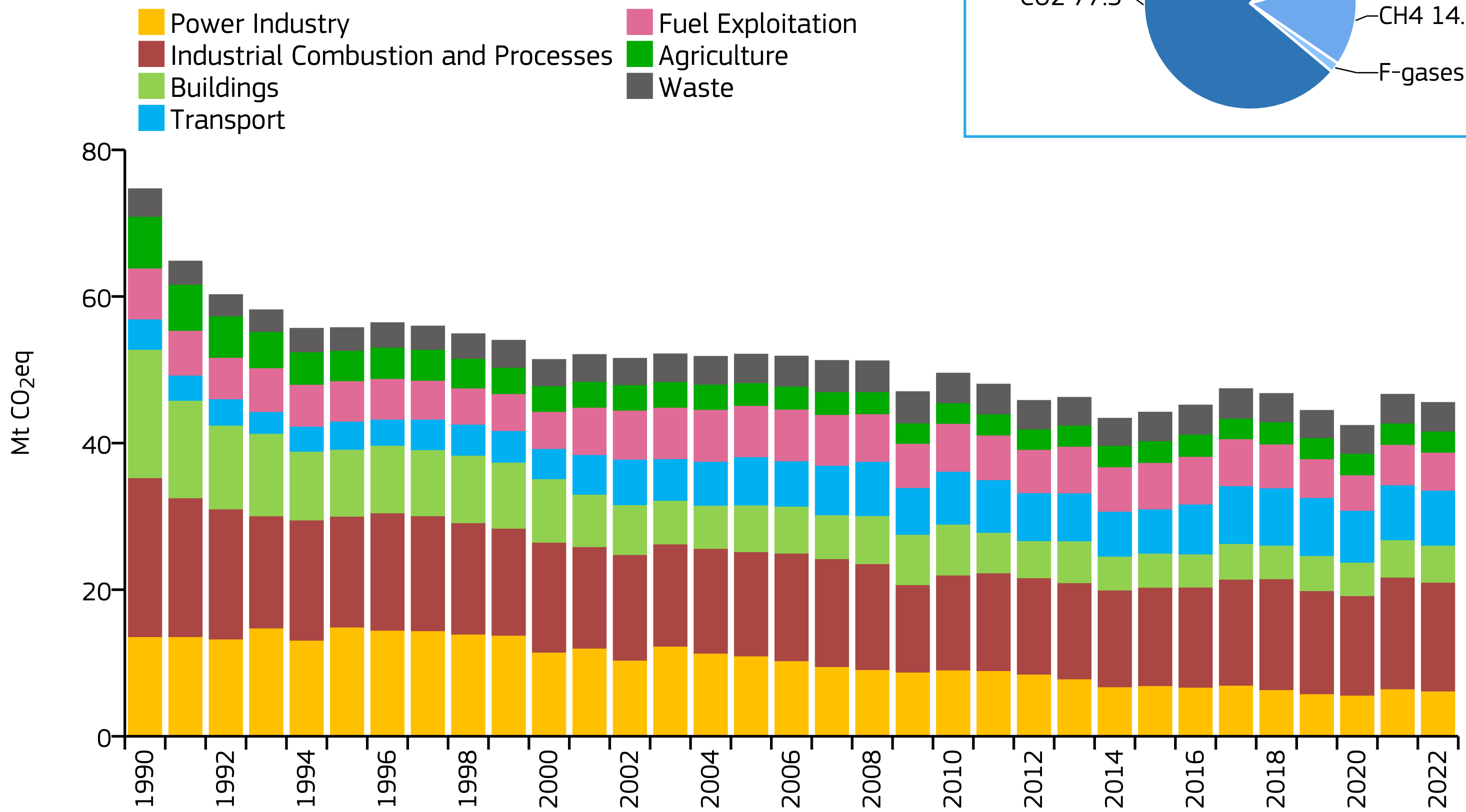
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+48%	+14%	-2%
Industrial Combustion and Processes	> +300%	+112%	0%
Buildings	-55%	+14%	-3%
Transport	+44%	+5%	-4%
Fuel Exploitation	-51%	-39%	-4%
Agriculture	-66%	+46%	+2%
Waste	> +300%	+60%	-2%
All sectors	+106%	+38%	-1%

Slovakia

GHG % in 2022



GHG emissions by sector

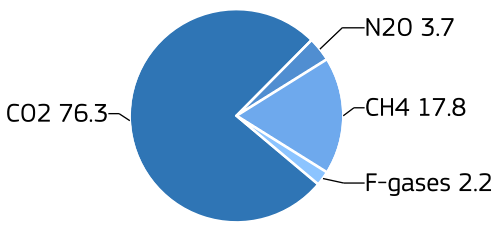


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.564	8.360	0.253	5.450M
2015	44.243	8.134	0.283	5.439M
2005	52.152	9.660	0.483	5.399M
1990	74.712	14.127	0.923	5.288M

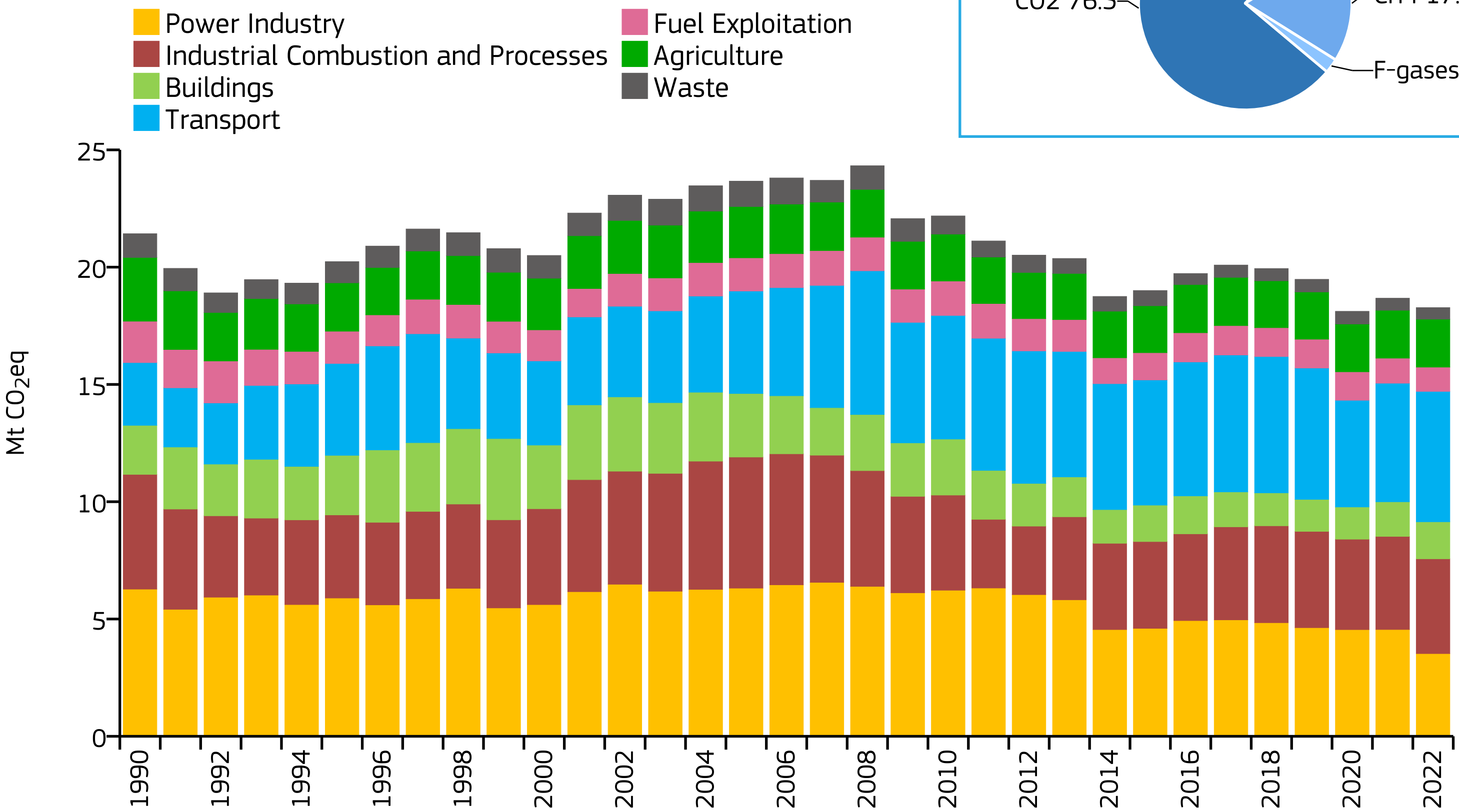
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-55%	-44%	-4%
Industrial Combustion and Processes	-32%	+4%	-3%
Buildings	-71%	-21%	-1%
Transport	+81%	+14%	0%
Fuel Exploitation	-25%	-26%	-6%
Agriculture	-59%	-8%	-1%
Waste	+4%	0%	0%
All sectors	-39%	-13%	-2%

Slovenia

GHG % in 2022



GHG emissions by sector

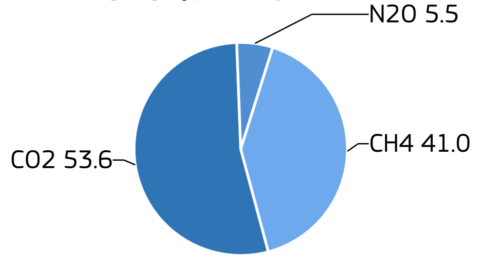


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	18.276	8.782	0.205	2.081M
2015	19.006	9.160	0.272	2.075M
2005	23.668	11.856	0.380	1.996M
1990	21.426	10.678	0.479	2.006M

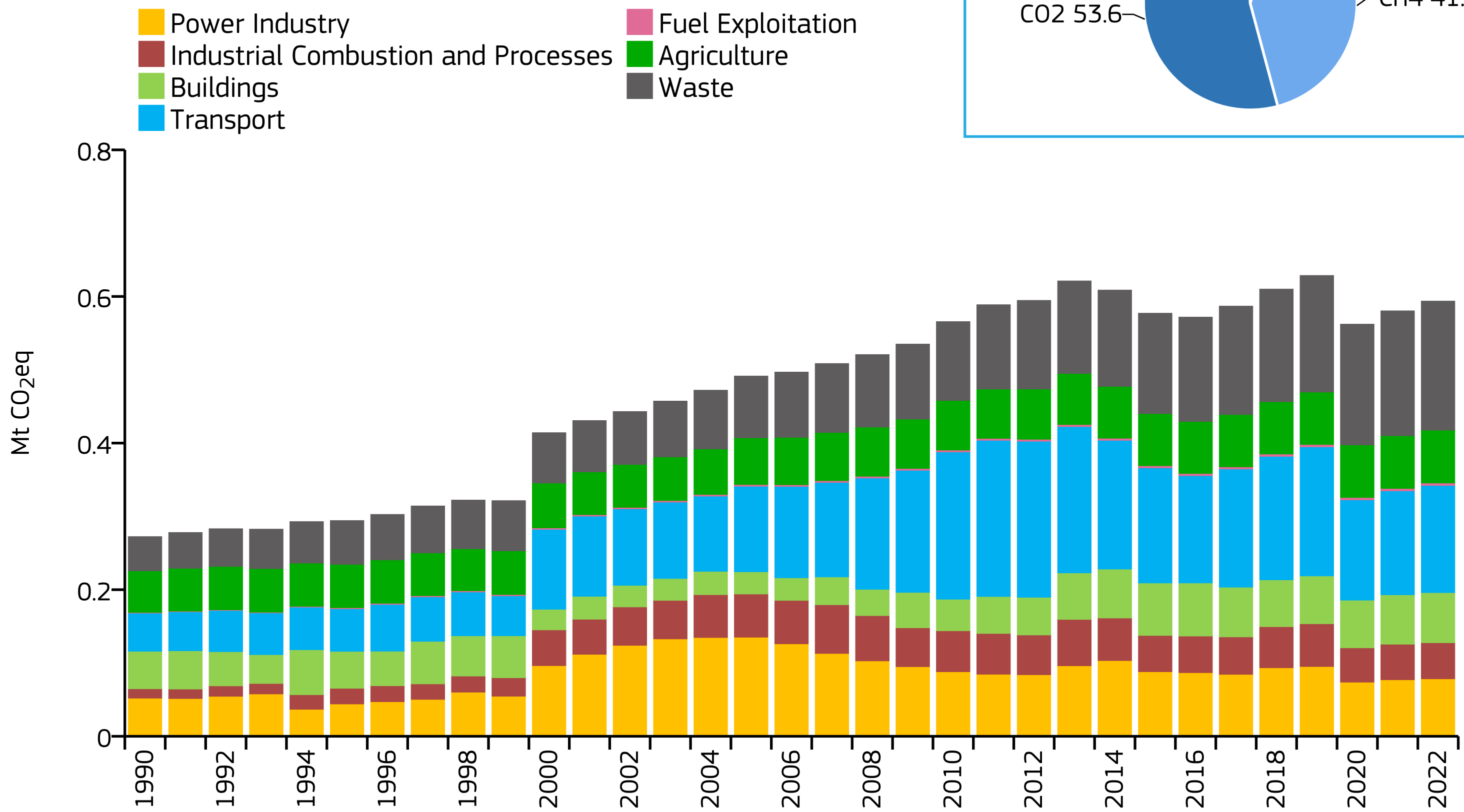
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-44%	-44%	-23%
Industrial Combustion and Processes	-17%	-28%	+2%
Buildings	-25%	-42%	+7%
Transport	+108%	+27%	+10%
Fuel Exploitation	-41%	-27%	-3%
Agriculture	-25%	-6%	0%
Waste	-51%	-54%	-4%
All sectors	-15%	-23%	-2%

Solomon Islands

GHG % in 2022



GHG emissions by sector

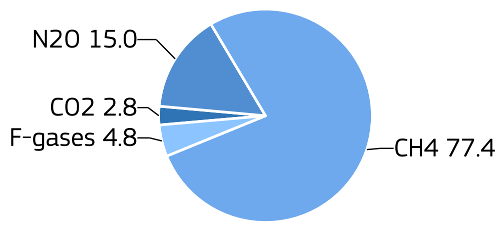


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.594	0.884	0.365	672.000k
2015	0.577	0.983	0.372	587.482k
2005	0.492	1.046	0.488	469.885k
1990	0.272	0.874	0.383	311.840k

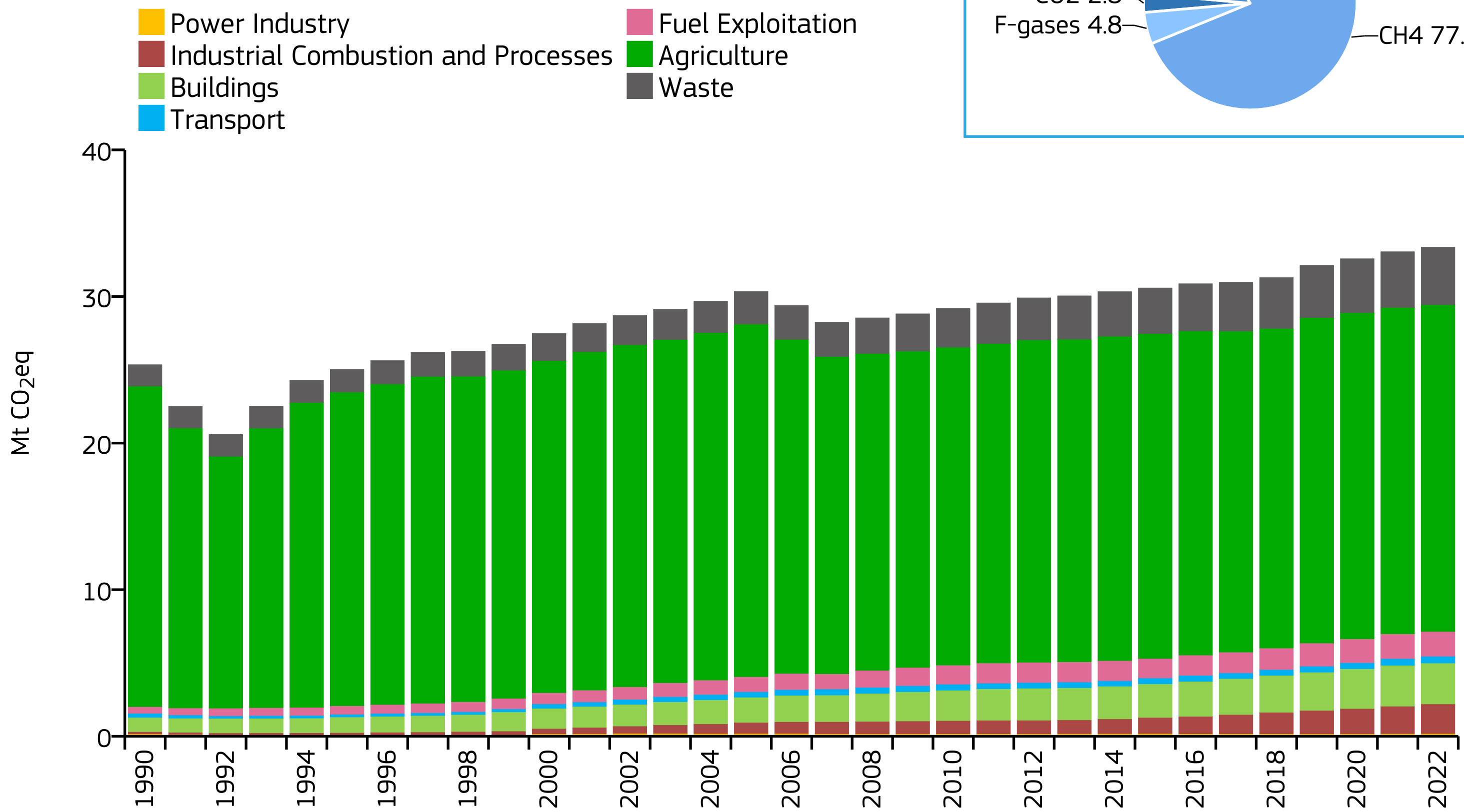
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+51%	-42%	+2%
Industrial Combustion and Processes	+288%	-16%	+2%
Buildings	+33%	+125%	+1%
Transport	+181%	+25%	+3%
Fuel Exploitation	+265%	+45%	0%
Agriculture	+27%	+13%	0%
Waste	+277%	+109%	+3%
All sectors	+118%	+21%	+2%

Somalia

GHG % in 2022



GHG emissions by sector

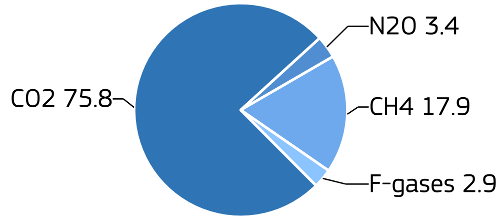


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	33.358	1.952	1.641	17.088M
2015	30.580	2.199	2.158	13.908M
2005	30.342	2.915	2.617	10.410M
1990	25.345	3.426	1.962	7.397M

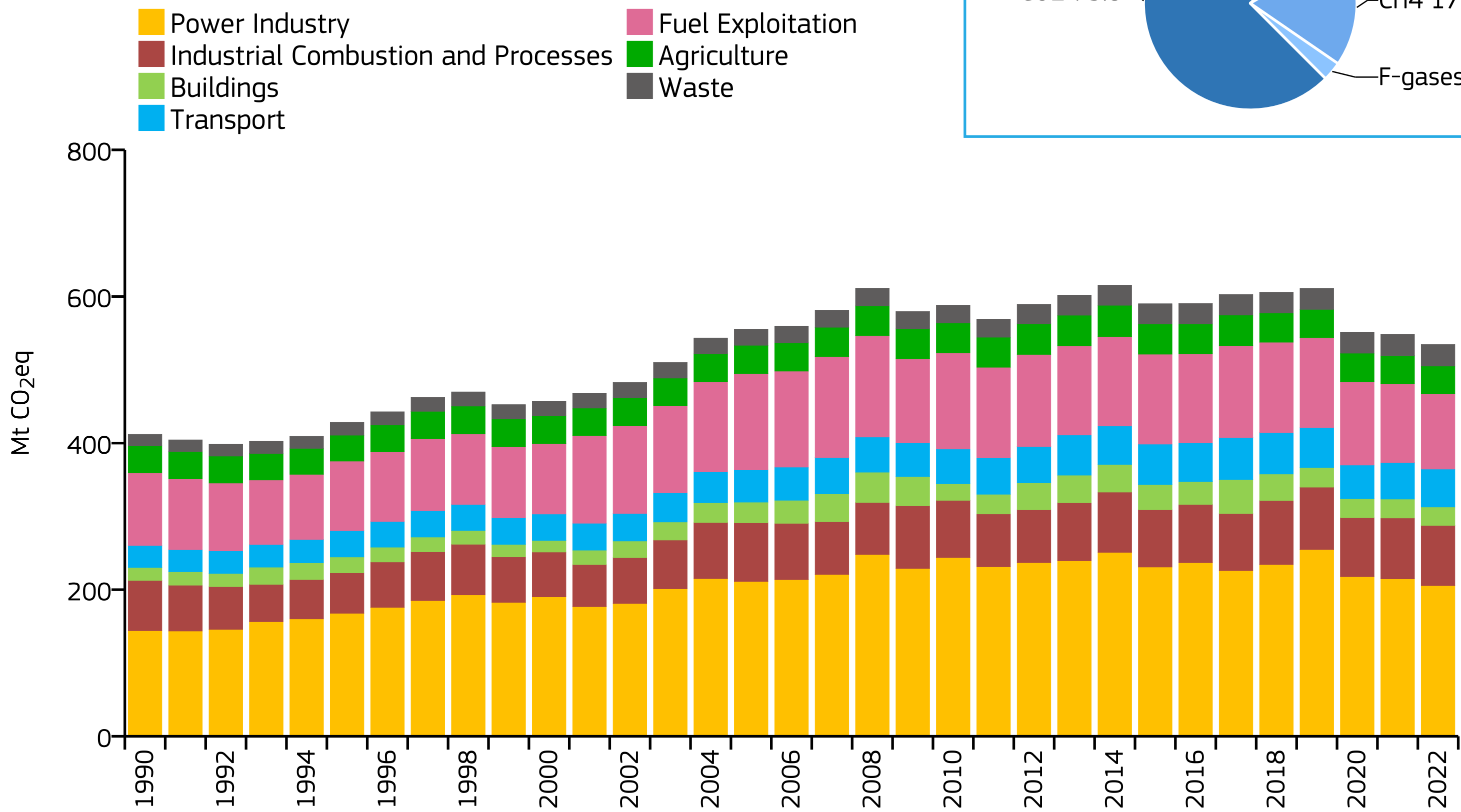
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+14%	-2%	+2%
Industrial Combustion and Processes	> +300%	+167%	+8%
Buildings	+189%	+62%	0%
Transport	+60%	+25%	+3%
Fuel Exploitation	+277%	+65%	0%
Agriculture	+2%	-7%	0%
Waste	+169%	+76%	+3%
All sectors	+32%	+10%	+1%

South Africa

GHG % in 2022



GHG emissions by sector

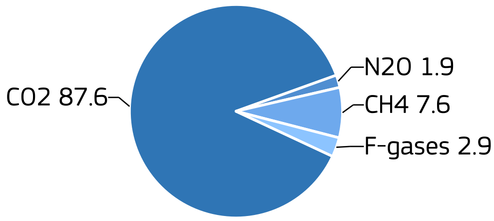


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	534.532	8.909	0.663	59.996M
2015	590.087	10.672	0.760	55.291M
2005	555.478	11.378	0.928	48.821M
1990	411.938	10.967	0.994	37.560M

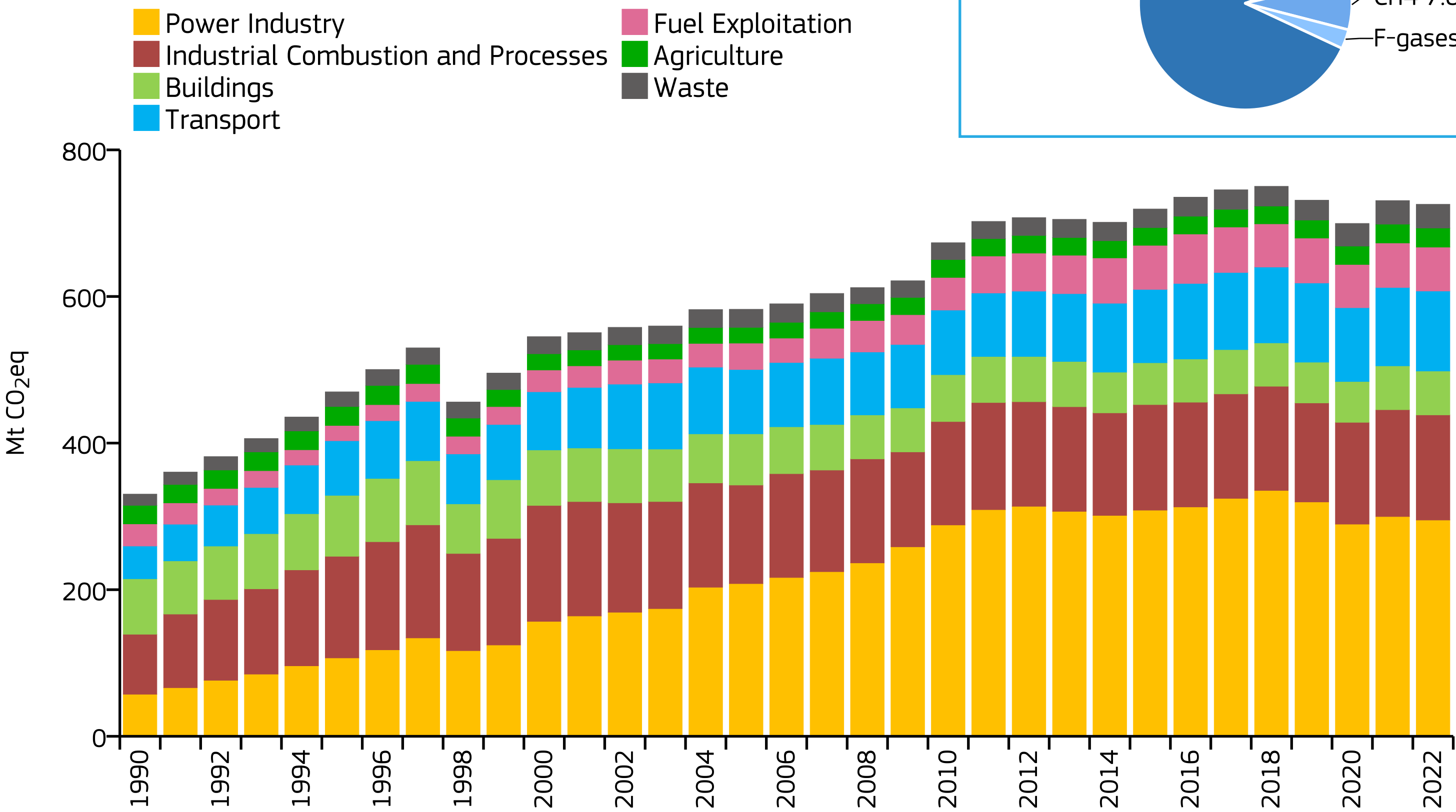
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+43%	-3%	-4%
Industrial Combustion and Processes	+20%	+3%	-1%
Buildings	+42%	-11%	-3%
Transport	+72%	+18%	+4%
Fuel Exploitation	+4%	-22%	-4%
Agriculture	+2%	-2%	-1%
Waste	+88%	+34%	+1%
All sectors	+30%	-4%	-3%

South Korea

GHG % in 2022



GHG emissions by sector

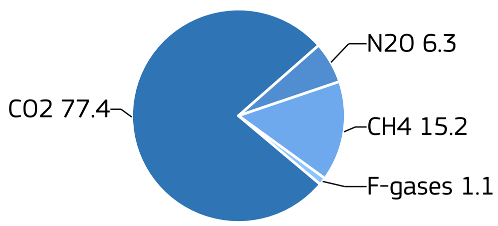


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	725.744	14.006	0.309	51.817M
2015	719.382	14.219	0.363	50.594M
2005	582.520	11.959	0.422	48.709M
1990	330.374	7.697	0.609	42.923M

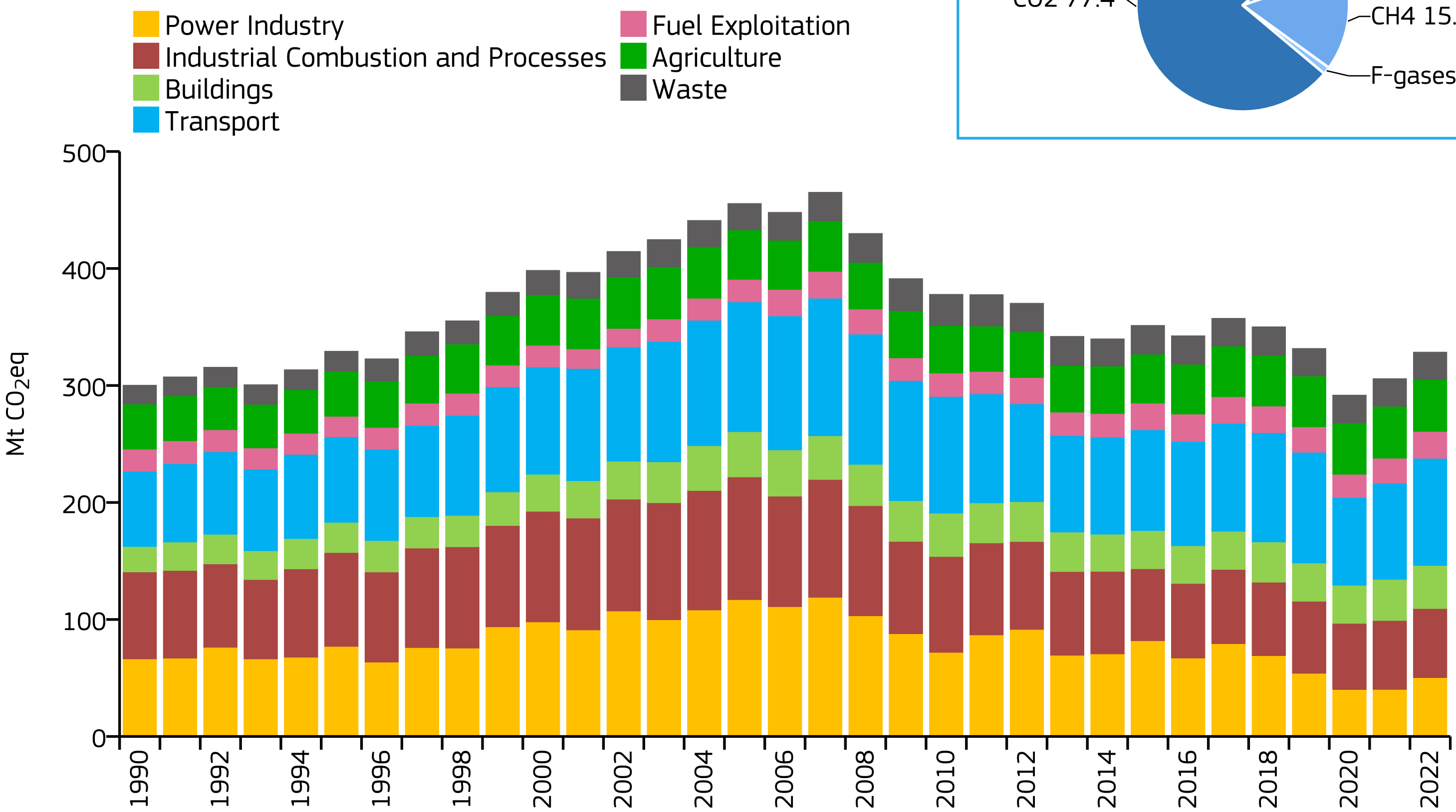
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+42%	-2%
Industrial Combustion and Processes	+75%	+7%	-2%
Buildings	-21%	-14%	0%
Transport	+145%	+25%	+2%
Fuel Exploitation	+98%	+66%	-1%
Agriculture	+3%	+21%	+2%
Waste	+112%	+31%	0%
All sectors	+120%	+25%	-1%

Spain and Andorra

GHG % in 2022



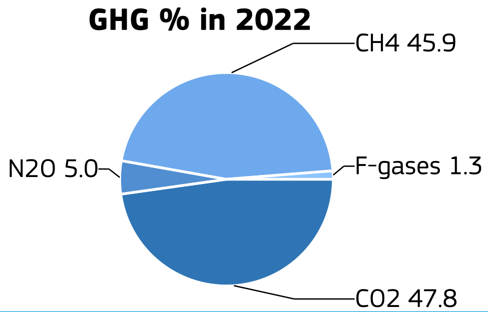
GHG emissions by sector



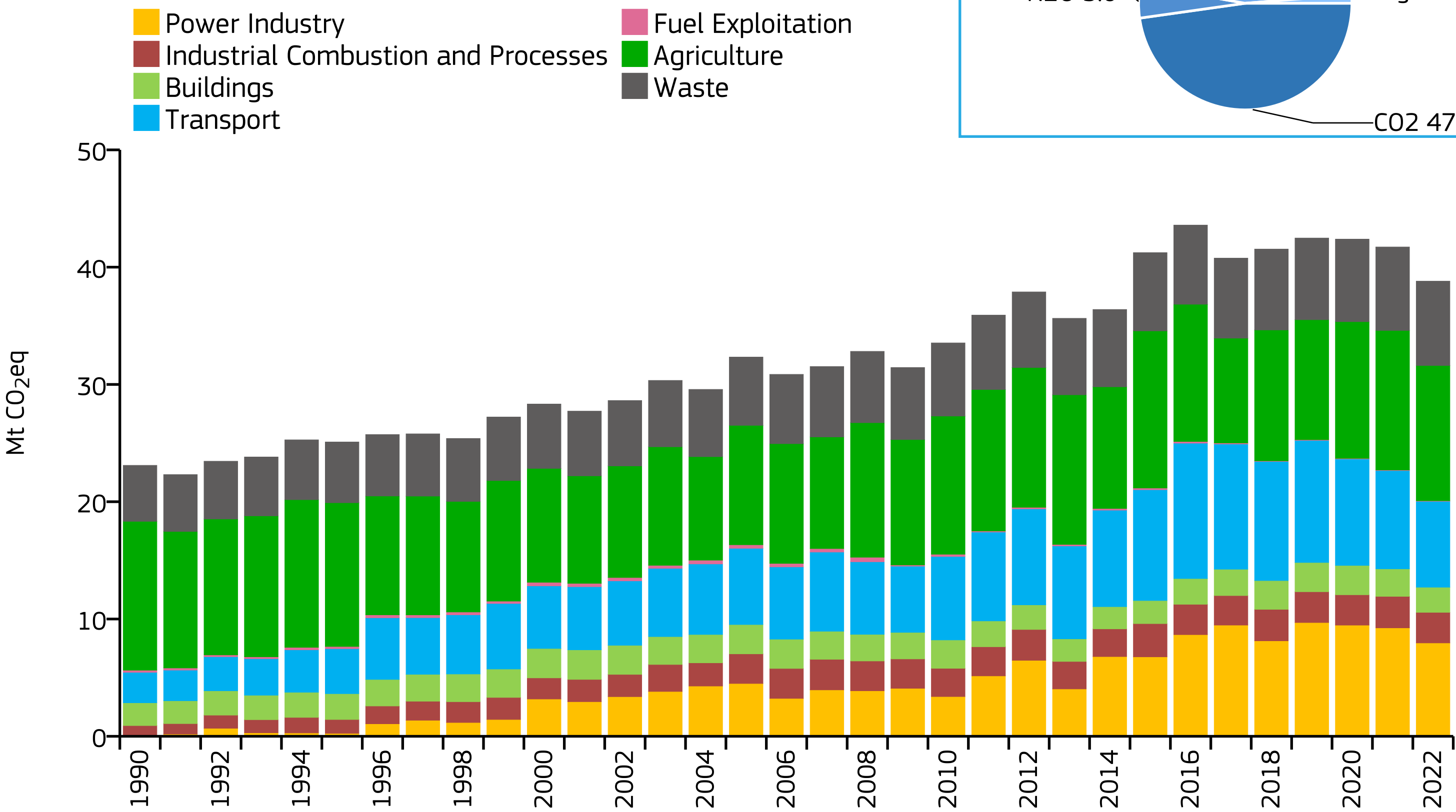
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	328.591	7.078	0.173	46.424M
2015	351.379	7.573	0.202	46.398M
2005	455.616	10.345	0.275	44.043M
1990	300.269	7.639	0.280	39.306M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-24%	-57%	+25%
Industrial Combustion and Processes	-21%	-44%	0%
Buildings	+69%	-5%	+5%
Transport	+42%	-18%	+11%
Fuel Exploitation	+22%	+20%	+7%
Agriculture	+16%	+5%	0%
Waste	+44%	+3%	-1%
All sectors	+9%	-28%	+7%

Sri Lanka



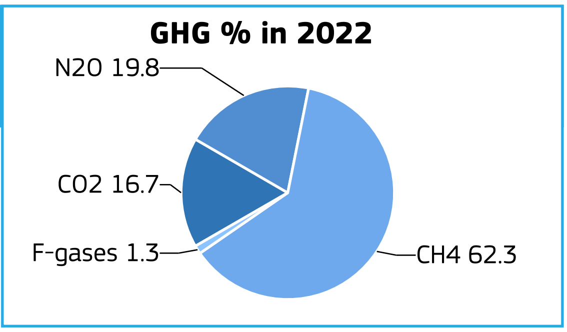
GHG emissions by sector



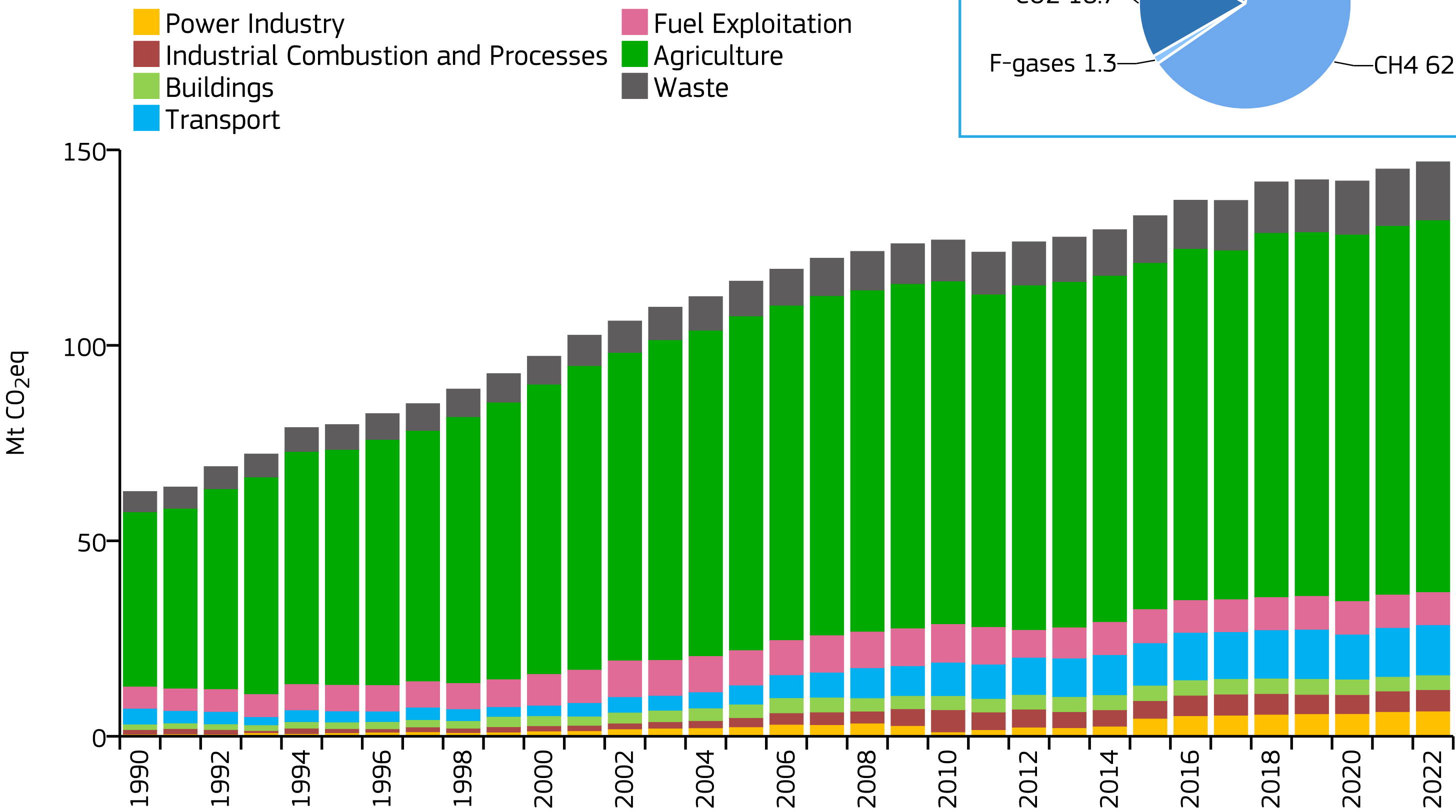
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	38.804	1.830	0.143	21.204M
2015	41.236	1.991	0.158	20.714M
2005	32.334	1.656	0.230	19.525M
1990	23.103	1.333	0.332	17.330M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+77%	-14%
Industrial Combustion and Processes	+188%	+3%	-3%
Buildings	+10%	-14%	-9%
Transport	+182%	+13%	-13%
Fuel Exploitation	-75%	-85%	-9%
Agriculture	-9%	+13%	-3%
Waste	+51%	+24%	+1%
All sectors	+68%	+20%	-7%

Sudan and South Sudan



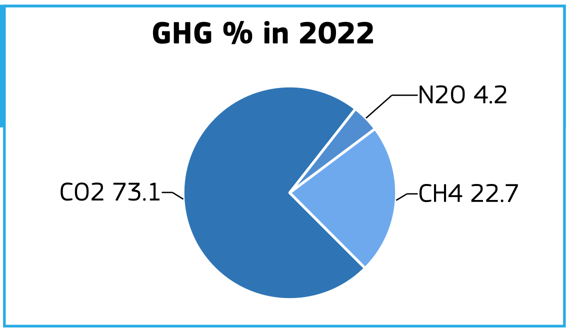
GHG emissions by sector



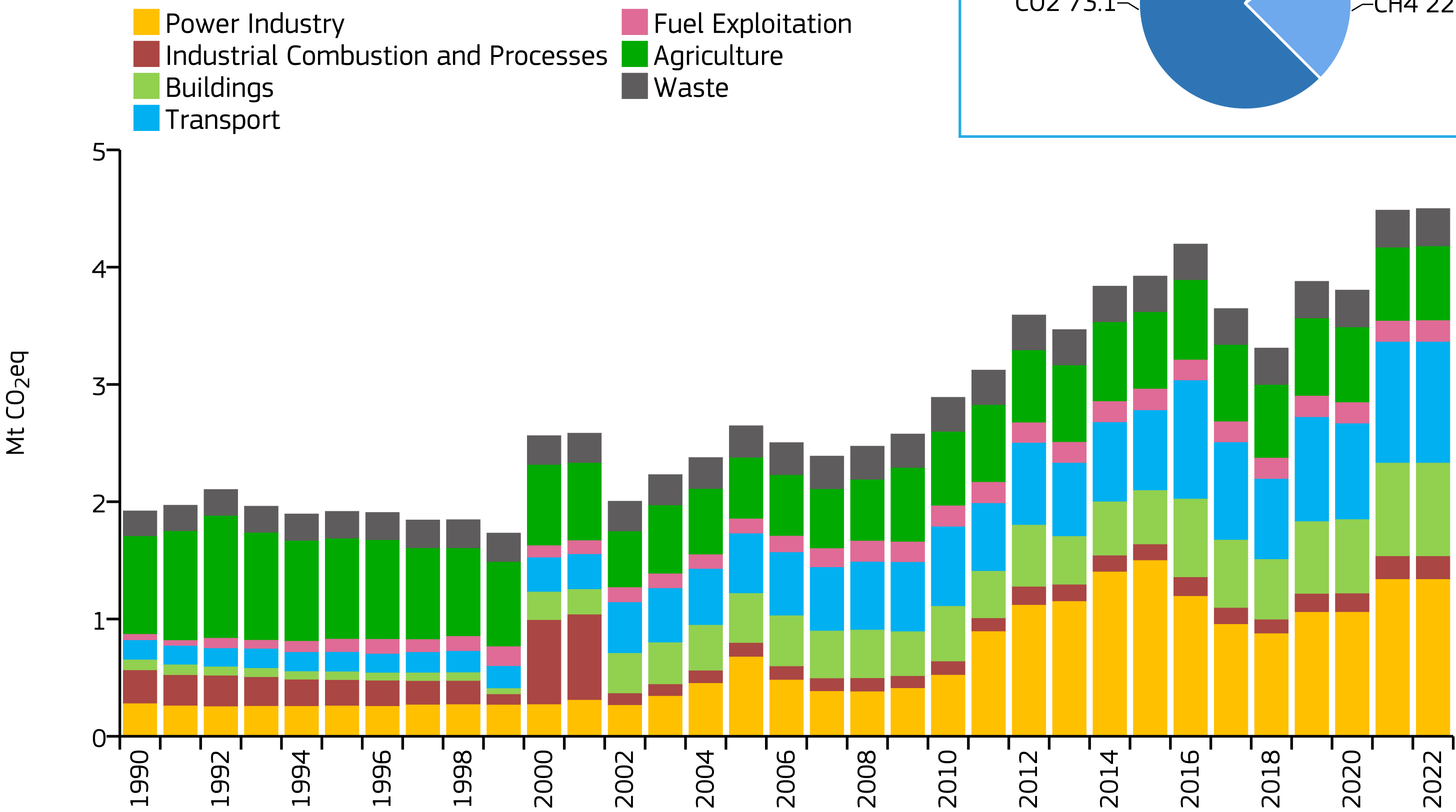
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	146.955	2.420	0.878	60.733M
2015	133.198	2.673	0.739	49.838M
2005	116.451	3.018	0.667	38.584M
1990	62.645	2.440	0.879	25.677M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+170%	+2%
Industrial Combustion and Processes	> +300%	+132%	+4%
Buildings	+168%	+8%	+1%
Transport	+219%	+163%	+2%
Fuel Exploitation	+50%	-6%	-1%
Agriculture	+113%	+11%	+1%
Waste	+183%	+67%	+3%
All sectors	+135%	+26%	+1%

Suriname



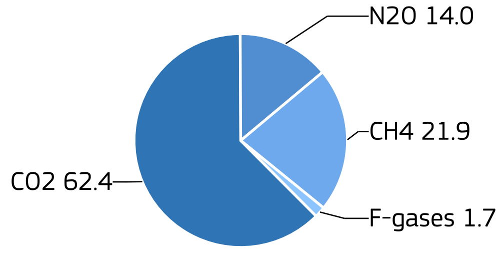
GHG emissions by sector



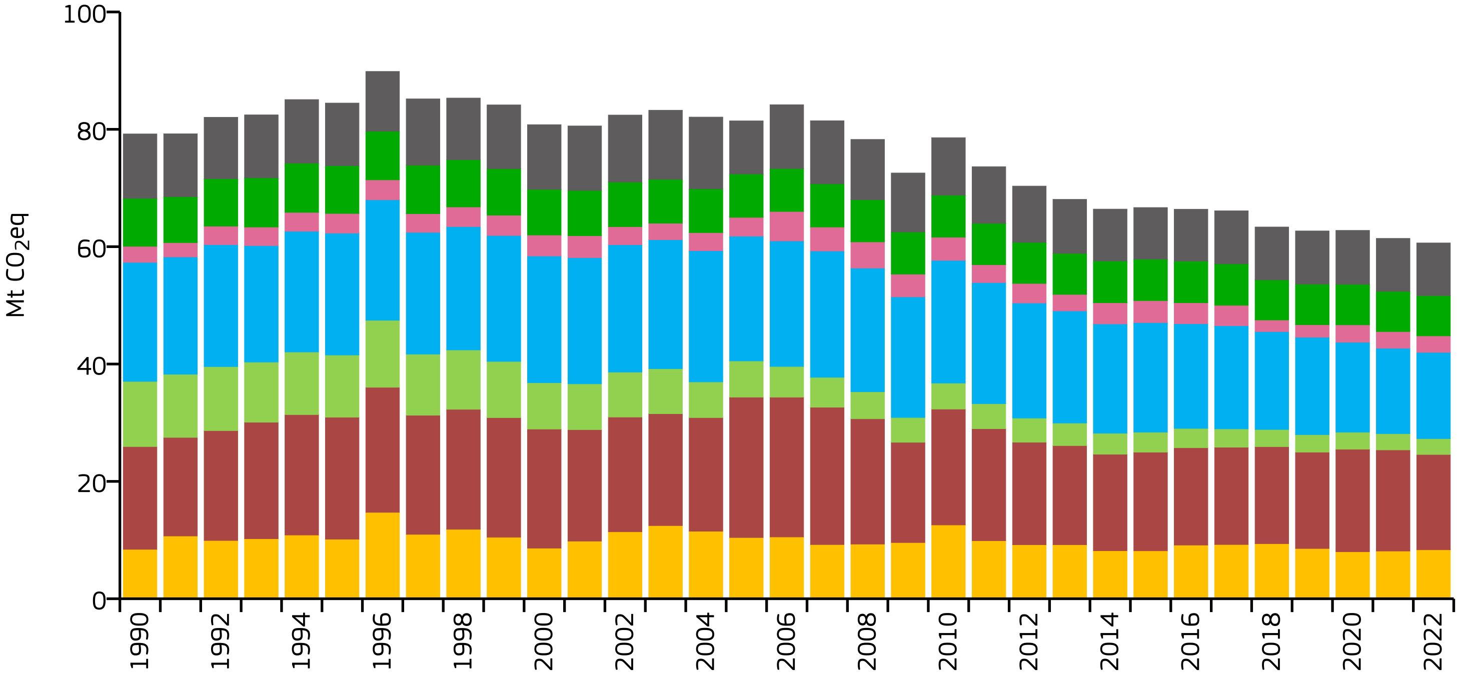
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	4.500	7.667	0.488	587.000k
2015	3.925	7.094	0.363	553.208k
2005	2.648	5.307	0.333	498.946k
1990	1.922	4.718	0.342	407.472k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+97%	0%
Industrial Combustion and Processes	-31%	+66%	0%
Buildings	> +300%	+88%	0%
Transport	> +300%	+103%	0%
Fuel Exploitation	+248%	+44%	+2%
Agriculture	-24%	+21%	+1%
Waste	+50%	+19%	+1%
All sectors	+134%	+70%	0%

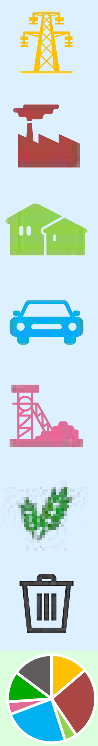
Sweden



GHG emissions by sector



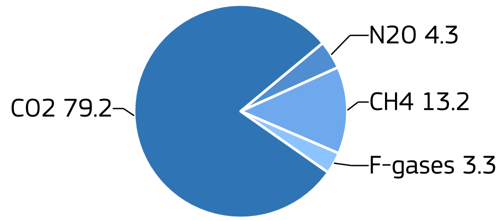
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	60.637	5.914	0.105	10.253M
2015	66.670	6.828	0.134	9.764M
2005	81.440	9.010	0.198	9.039M
1990	79.215	9.246	0.271	8.567M



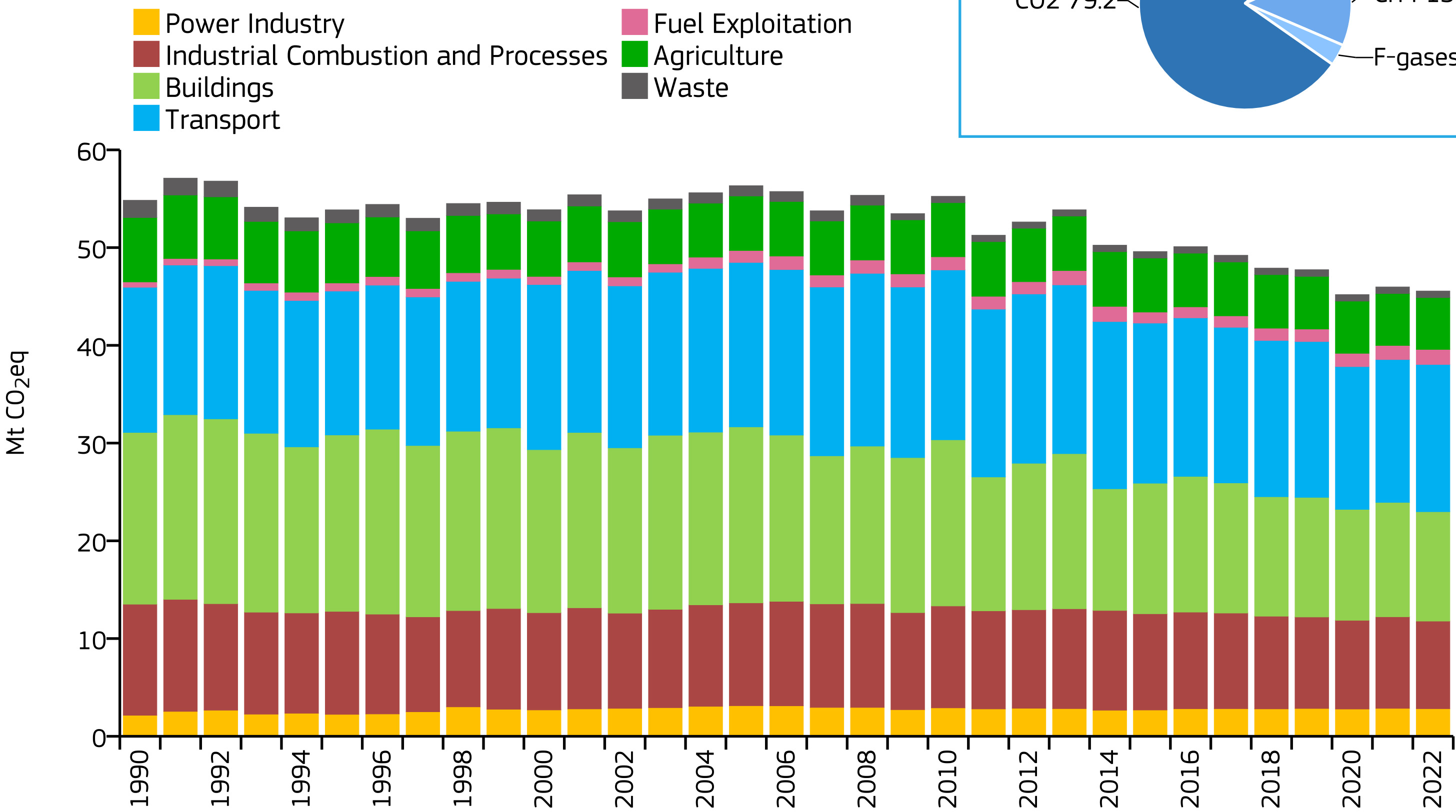
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-1%	-20%	+3%
Industrial Combustion and Processes	-7%	-32%	-6%
Buildings	-76%	-56%	-2%
Transport	-28%	-31%	+1%
Fuel Exploitation	+3%	-12%	-1%
Agriculture	-16%	-7%	0%
Waste	-18%	-1%	-1%
All sectors	-23%	-26%	-1%

Switzerland and Liechtenstein

GHG % in 2022



GHG emissions by sector

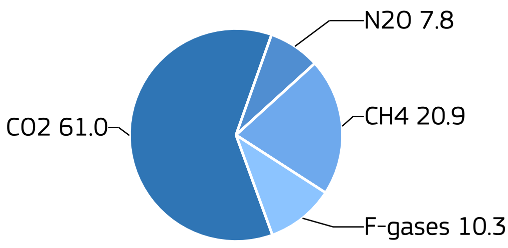


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.564	5.184	0.073	8.789M
2015	49.604	5.962	0.089	8.320M
2005	56.335	7.602	0.124	7.410M
1990	54.843	8.216	0.145	6.675M

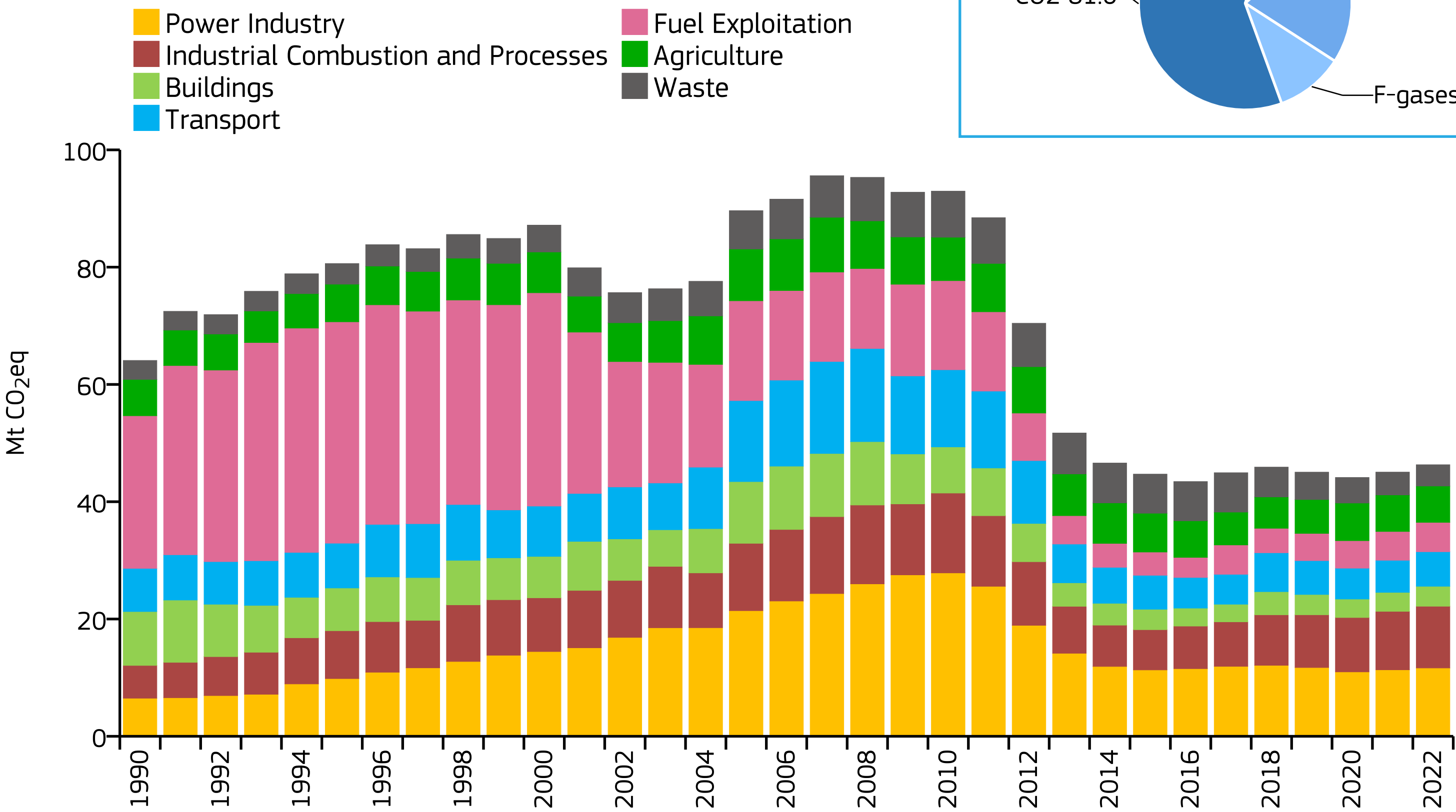
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+31%	-10%	-1%
Industrial Combustion and Processes	-21%	-15%	-4%
Buildings	-36%	-38%	-4%
Transport	+1%	-10%	+3%
Fuel Exploitation	+180%	+26%	+7%
Agriculture	-20%	-5%	0%
Waste	-61%	-35%	0%
All sectors	-17%	-19%	-1%

Syria

GHG % in 2022



GHG emissions by sector

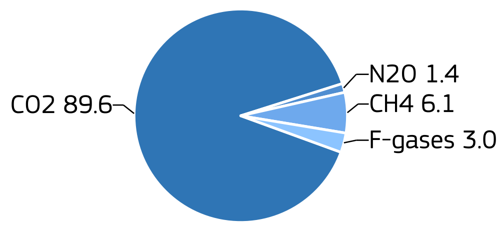


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	46.312	2.263	1.997	20.467M
2015	44.709	2.386	1.629	18.735M
2005	89.637	4.900	2.668	18.295M
1990	64.098	5.150	3.719	12.446M

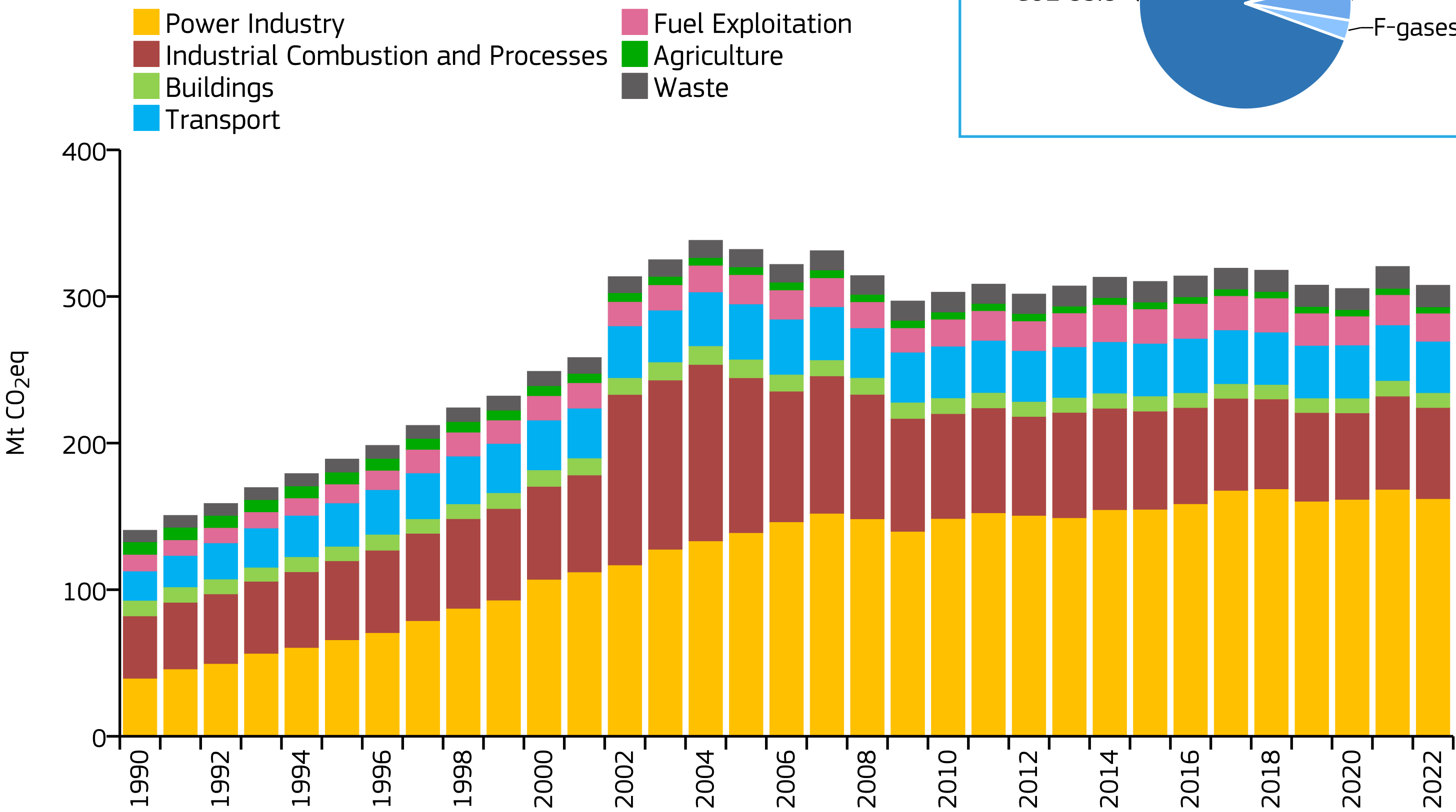
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+79%	-46%	+3%
Industrial Combustion and Processes	+89%	-8%	+6%
Buildings	-63%	-68%	+5%
Transport	-20%	-57%	+7%
Fuel Exploitation	-81%	-71%	+2%
Agriculture	0%	-30%	-1%
Waste	+12%	-44%	-7%
All sectors	-28%	-48%	+3%

Taiwan

GHG % in 2022



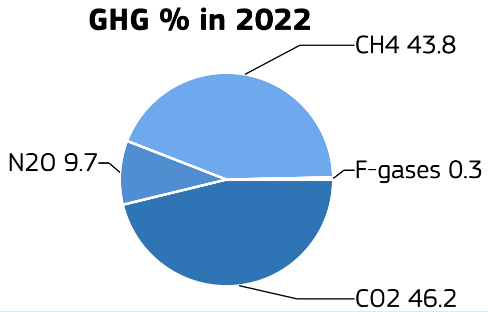
GHG emissions by sector



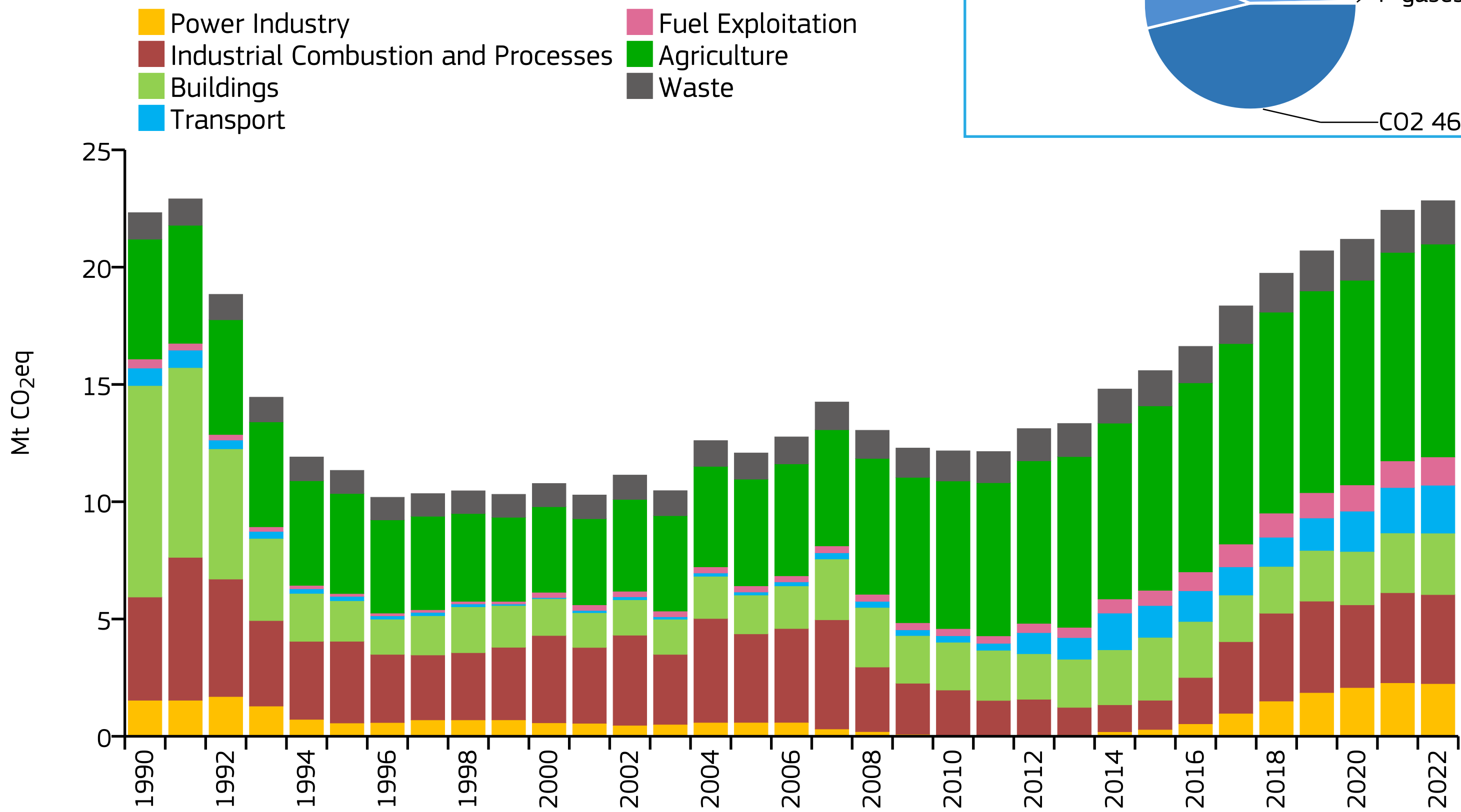
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	307.682	12.861	0.191	23.923M
2015	310.304	13.212	0.282	23.486M
2005	332.140	14.695	0.507	22.603M
1990	140.576	6.921	0.689	20.312M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+17%	-4%
Industrial Combustion and Processes	+46%	-41%	-2%
Buildings	-5%	-20%	-4%
Transport	+75%	-7%	-8%
Fuel Exploitation	+69%	-4%	-7%
Agriculture	-50%	-20%	-2%
Waste	+86%	+24%	-1%
All sectors	+119%	-7%	-4%

Tajikistan



GHG emissions by sector

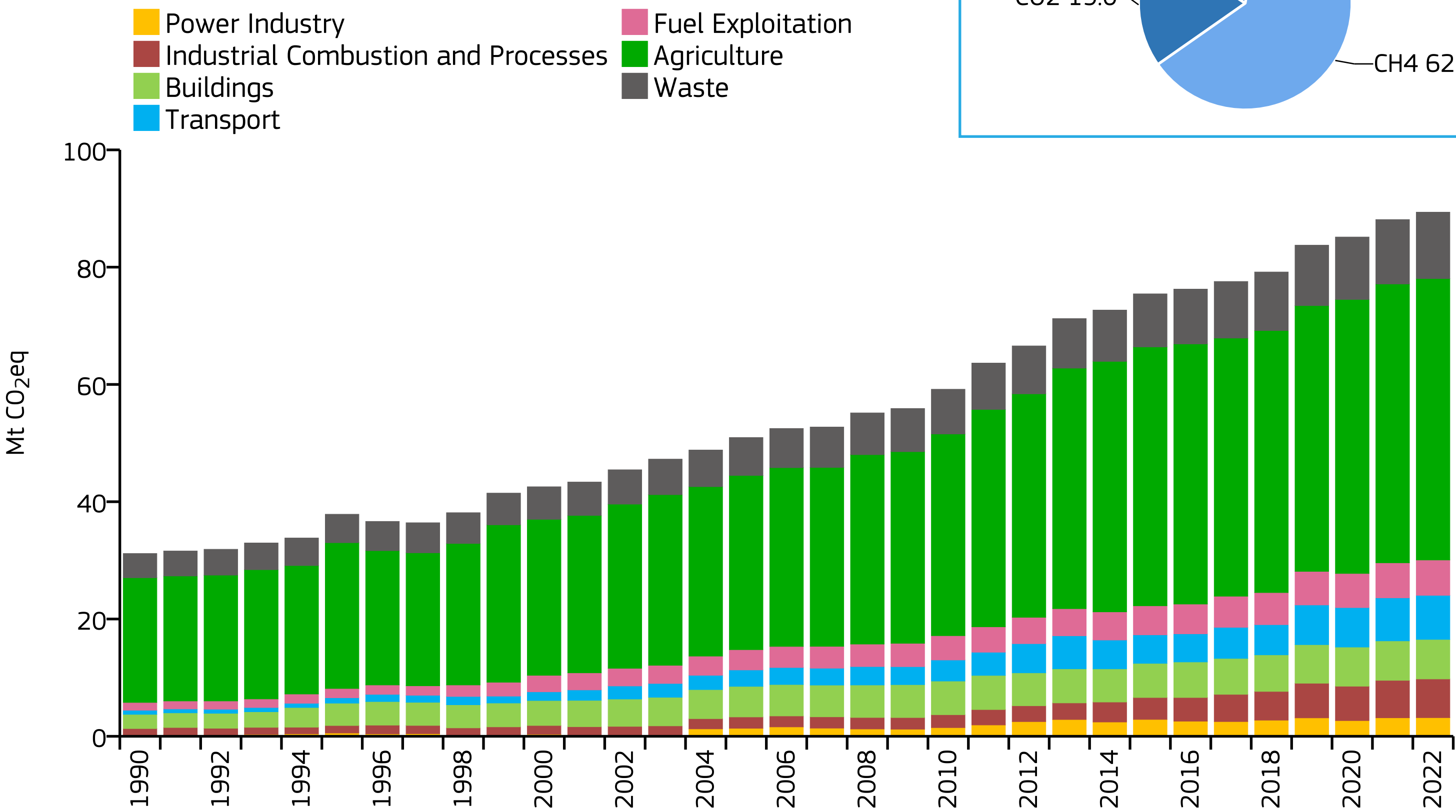


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	22.834	2.321	0.555	9.836M
2015	15.590	1.824	0.618	8.549M
2005	12.081	1.763	0.925	6.854M
1990	22.325	4.225	1.033	5.284M

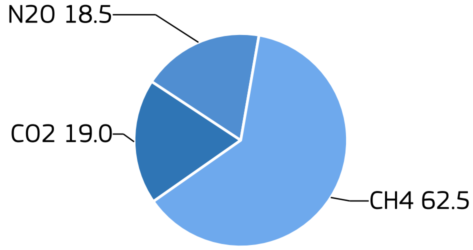
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+46%	+280%	-2%
Industrial Combustion and Processes	-14%	+1%	-1%
Buildings	-71%	+58%	+3%
Transport	+174%	> +300%	+6%
Fuel Exploitation	+211%	> +300%	+6%
Agriculture	+78%	+99%	+2%
Waste	+63%	+65%	+3%
All sectors	+2%	+89%	+2%

Tanzania

GHG emissions by sector



GHG % in 2022

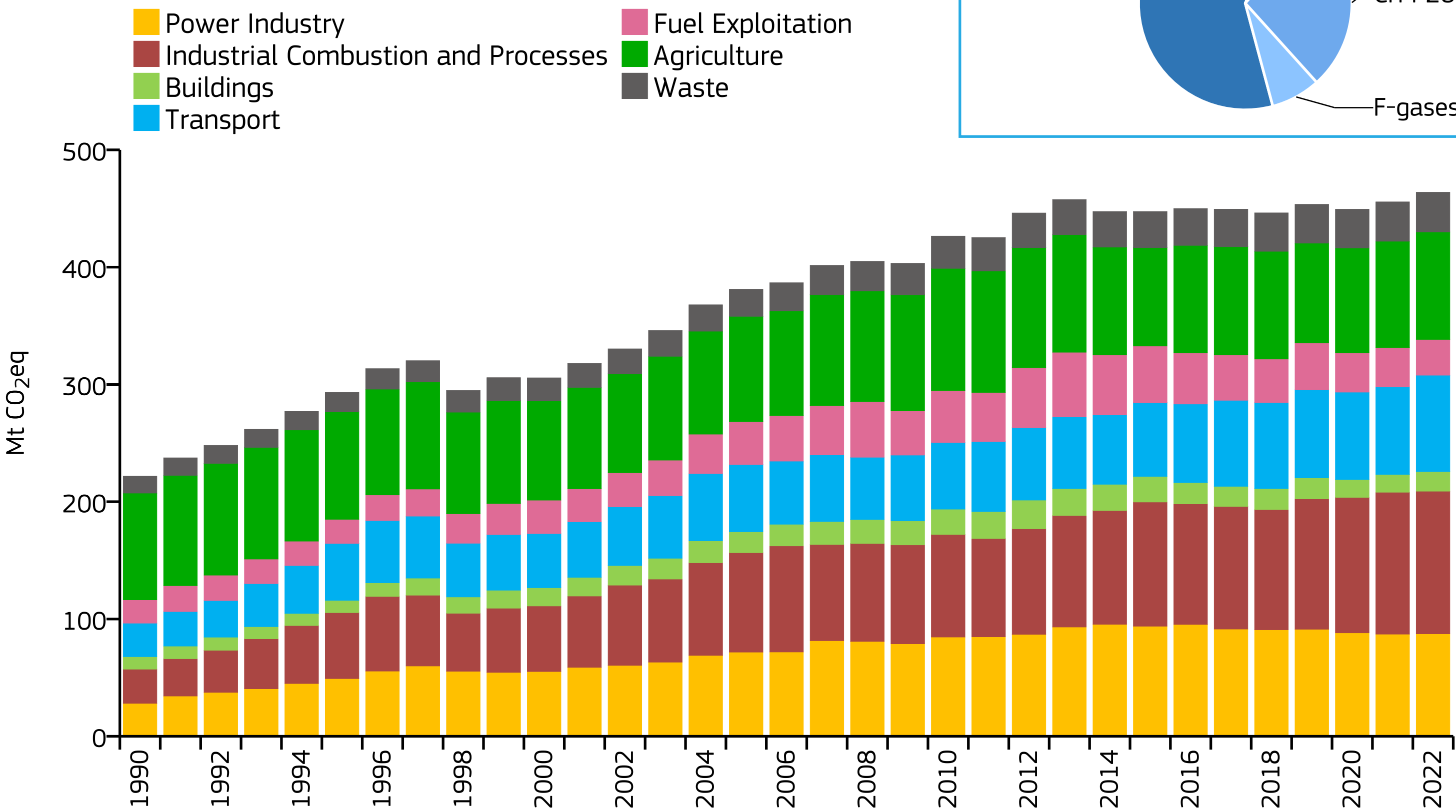


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	89.378	1.342	0.537	66.612M
2015	75.452	1.400	0.642	53.880M
2005	50.949	1.293	0.794	39.410M
1990	31.170	1.224	0.914	25.460M

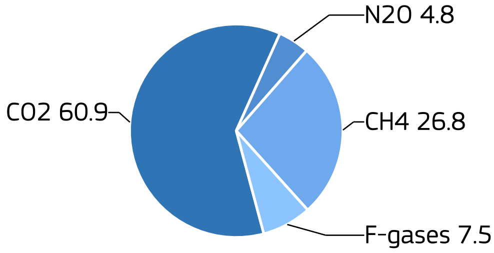
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+134%	+1%
Industrial Combustion and Processes	> +300%	+241%	+3%
Buildings	+179%	+29%	0%
Transport	> +300%	+168%	+2%
Fuel Exploitation	> +300%	+74%	+1%
Agriculture	+126%	+62%	+1%
Waste	+174%	+75%	+3%
All sectors	+187%	+75%	+1%

Thailand

GHG emissions by sector



GHG % in 2022

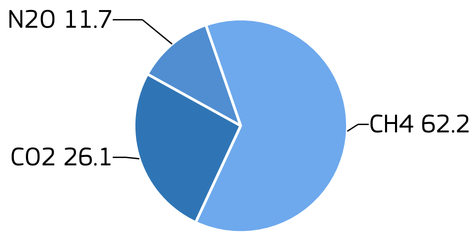


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	463.875	6.668	0.370	69.567M
2015	447.446	6.517	0.400	68.658M
2005	381.183	5.826	0.474	65.425M
1990	221.898	3.922	0.552	56.583M

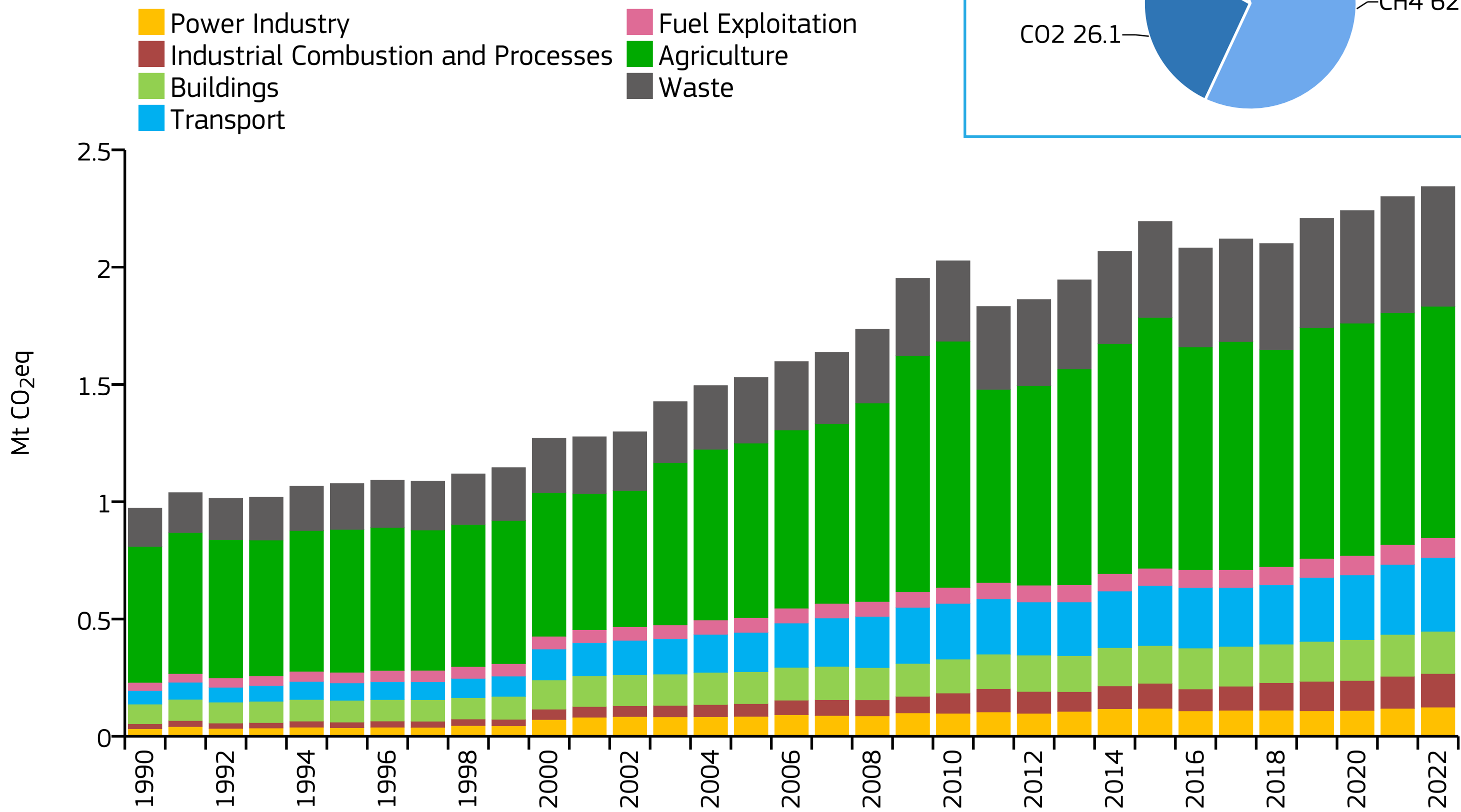
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+211%	+22%	0%
Industrial Combustion and Processes	> +300%	+43%	0%
Buildings	+57%	-6%	+10%
Transport	+187%	+43%	+10%
Fuel Exploitation	+54%	-17%	-9%
Agriculture	+1%	+2%	+1%
Waste	+133%	+46%	+1%
All sectors	+109%	+22%	+2%

The Gambia

GHG % in 2022



GHG emissions by sector

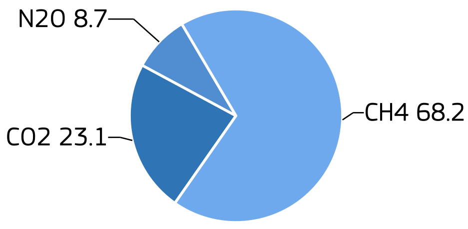


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.343	0.966	0.407	2.427M
2015	2.195	1.110	0.511	1.978M
2005	1.530	1.059	0.447	1.444M
1990	0.973	1.061	0.449	916.808k

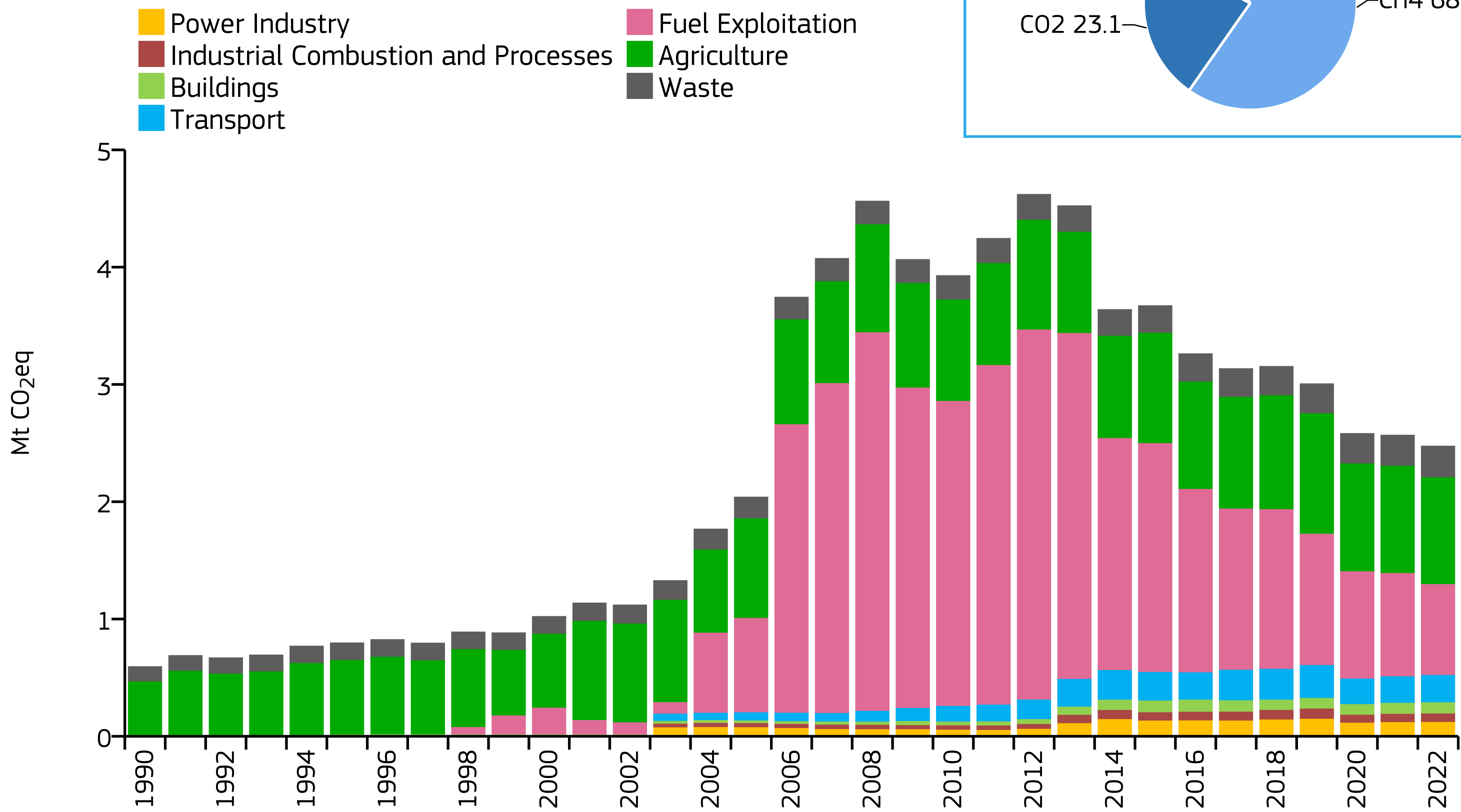
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+288%	+47%	+5%
Industrial Combustion and Processes	> +300%	+163%	+4%
Buildings	+115%	+33%	+1%
Transport	> +300%	+87%	+5%
Fuel Exploitation	+142%	+35%	0%
Agriculture	+70%	+33%	0%
Waste	+211%	+82%	+3%
All sectors	+141%	+53%	+2%

Timor-Leste

GHG % in 2022



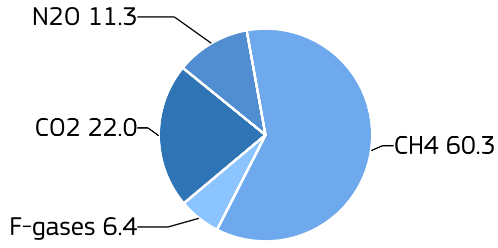
GHG emissions by sector



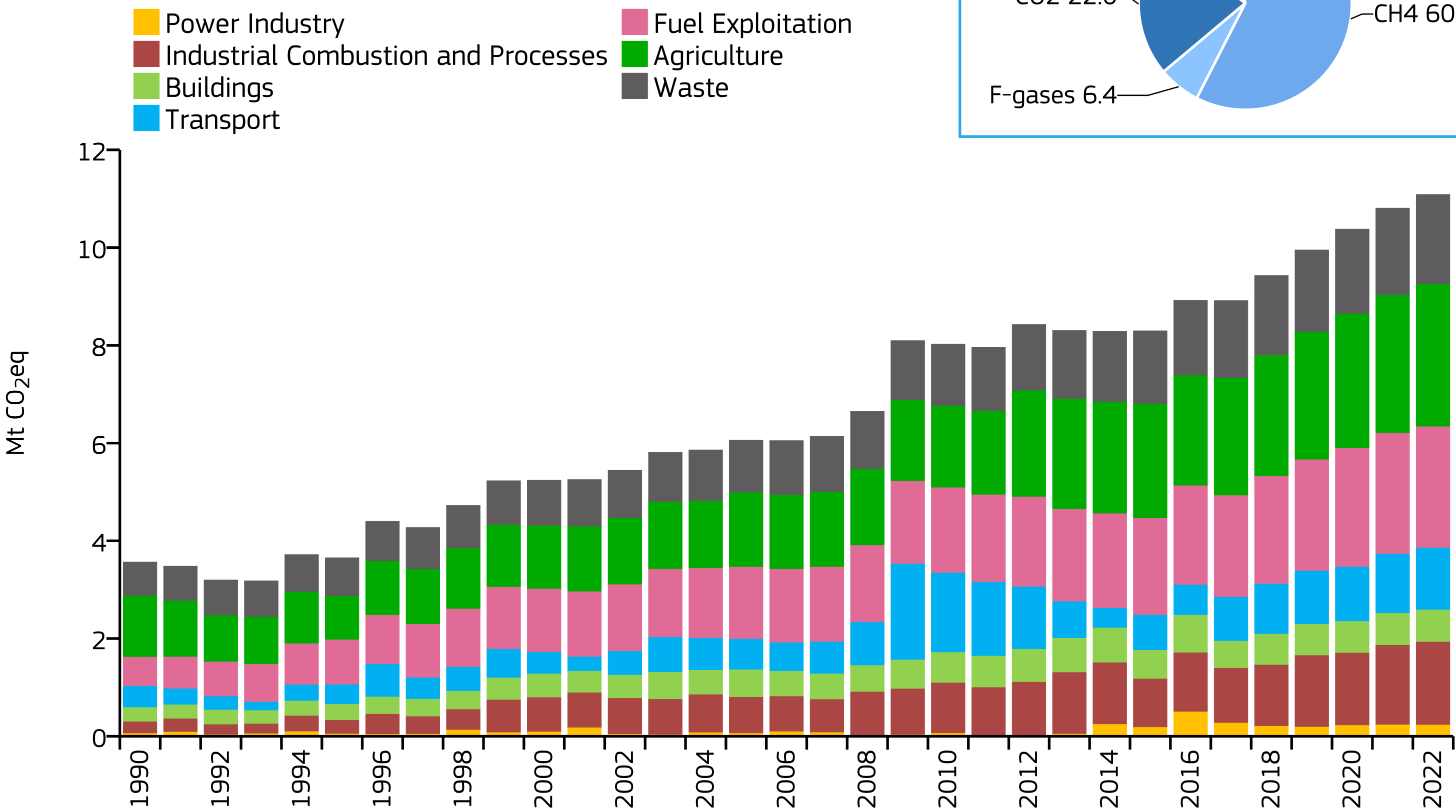
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	2.476	1.718	0.451	1.441M
2015	3.672	2.959	0.943	1.241M
2005	2.041	1.988	0.914	1.026M
1990	0.595	0.791	0.389	751.933k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+57%	+2%
Industrial Combustion and Processes	> +300%	+106%	+2%
Buildings	> +300%	> +300%	+2%
Transport	n/a	+240%	+3%
Fuel Exploitation	n/a	-4%	-12%
Agriculture	+98%	+7%	0%
Waste	+113%	+47%	+2%
All sectors	> +300%	+21%	-4%

Togo



GHG emissions by sector

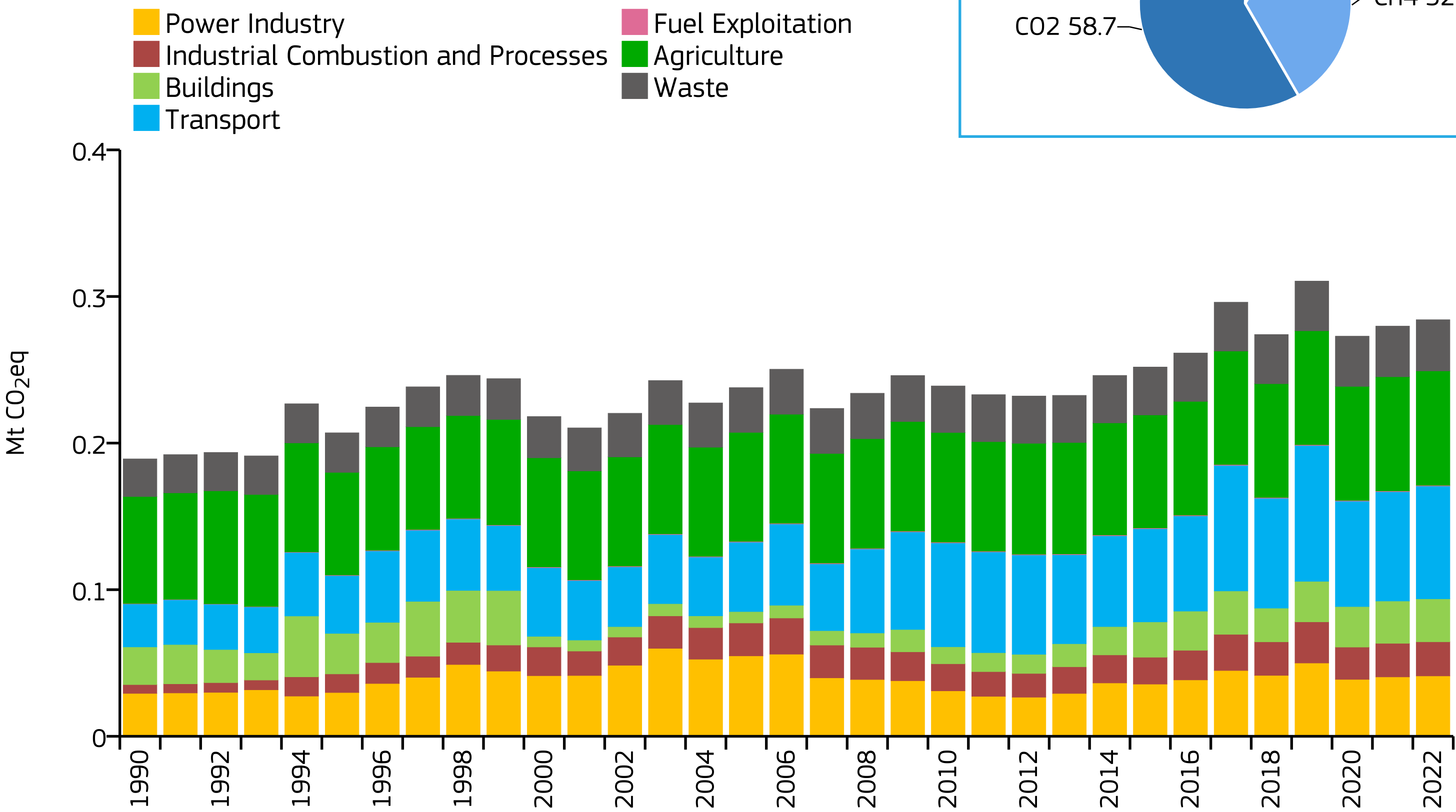


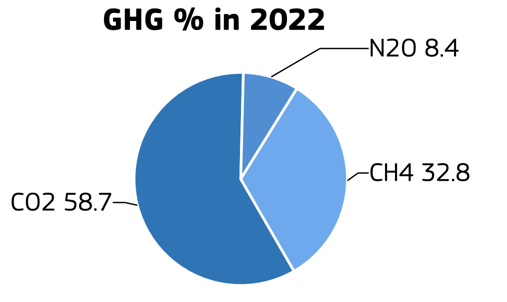
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	11.088	1.262	0.567	8.787M
2015	8.298	1.119	0.590	7.417M
2005	6.064	1.067	0.687	5.683M
1990	3.569	0.942	0.529	3.787M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+257%	+251%	-2%
Industrial Combustion and Processes	> +300%	+130%	+4%
Buildings	+126%	+16%	+1%
Transport	+193%	+103%	+5%
Fuel Exploitation	> +300%	+68%	0%
Agriculture	+133%	+92%	+3%
Waste	+167%	+71%	+3%
All sectors	+211%	+83%	+3%

Tonga

GHG emissions by sector



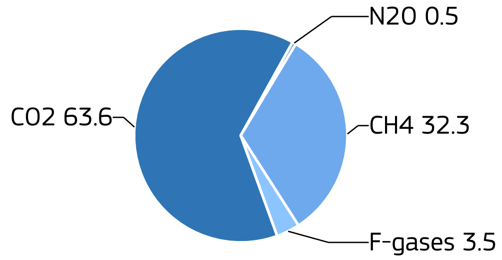


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.284	2.514	0.448	113.000k
2015	0.252	2.368	0.420	106.364k
2005	0.238	2.354	0.444	101.041k
1990	0.189	1.989	0.529	95.153k

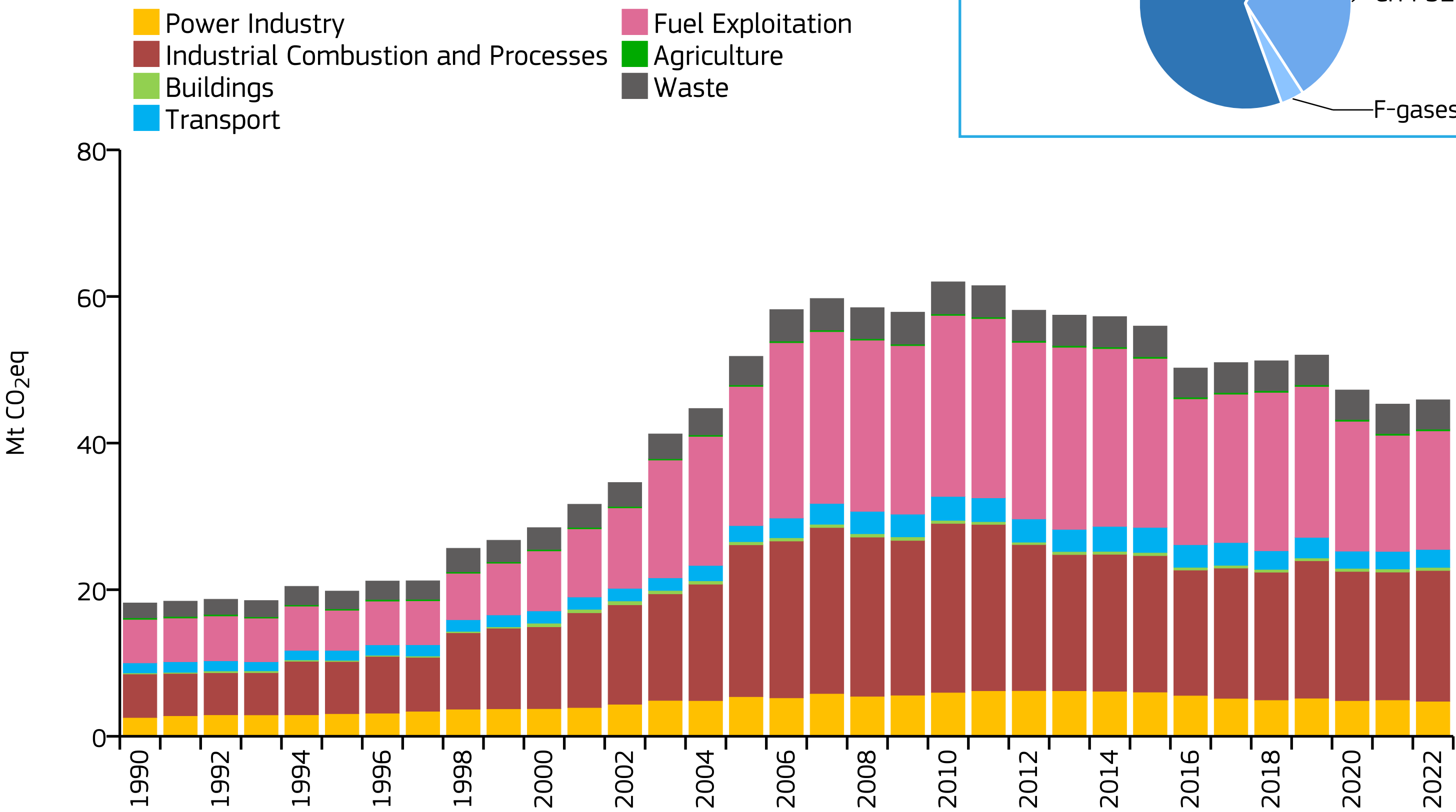
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+41%	-25%	+2%
Industrial Combustion and Processes	+287%	+4%	+2%
Buildings	+14%	+277%	+2%
Transport	+162%	+62%	+3%
Fuel Exploitation	+86%	+1%	0%
Agriculture	+7%	+5%	0%
Waste	+36%	+14%	+1%
All sectors	+50%	+19%	+2%

Trinidad and Tobago

GHG % in 2022



GHG emissions by sector

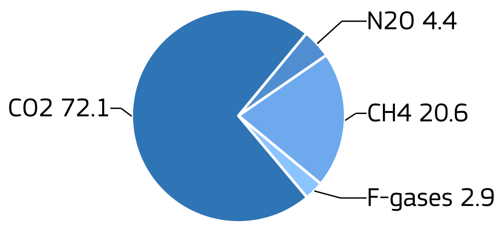


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	45.911	33.269	1.275	1.380M
2015	55.974	41.155	1.283	1.360M
2005	51.840	39.972	1.629	1.297M
1990	18.194	14.890	1.471	1.222M

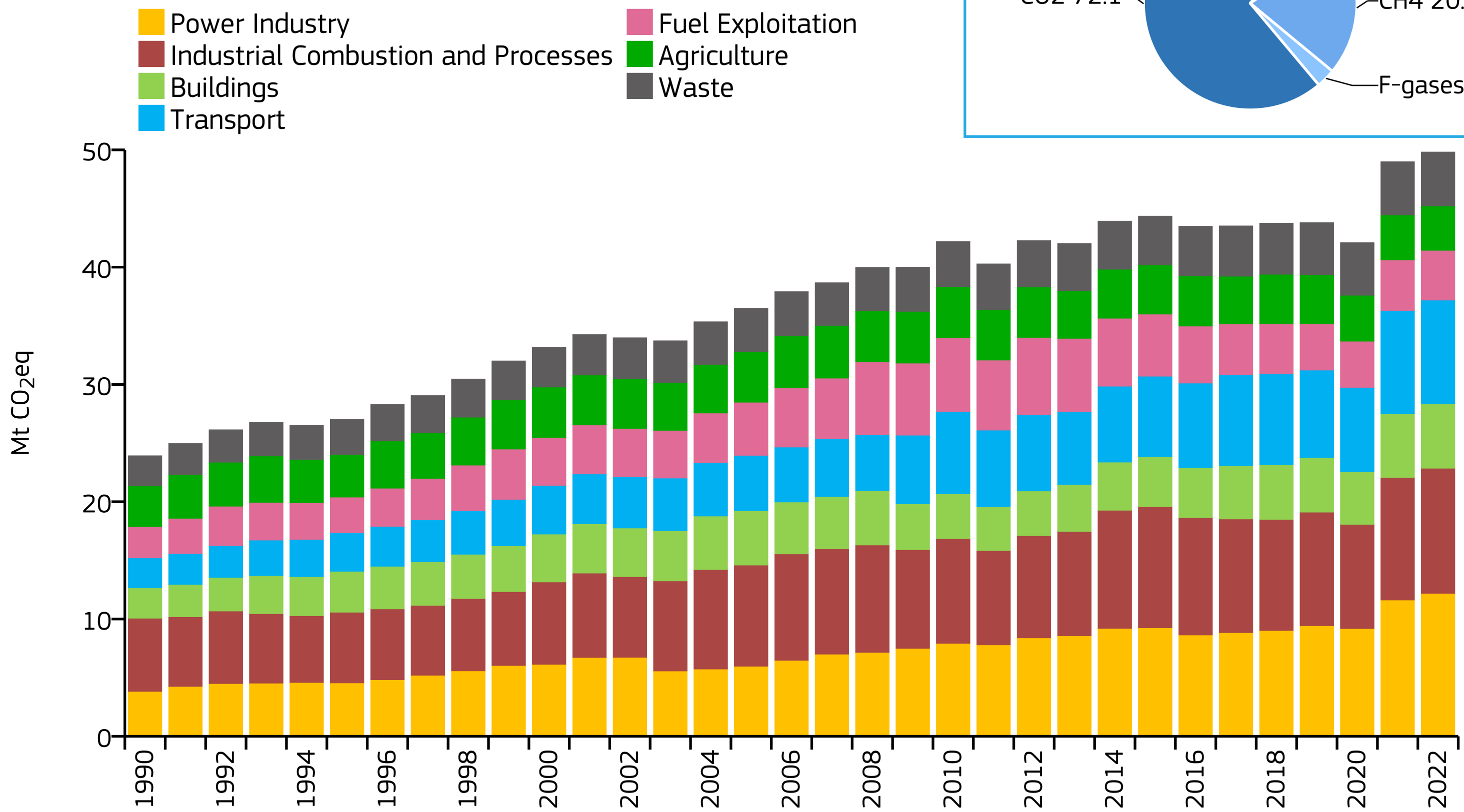
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+87%	-12%	-4%
Industrial Combustion and Processes	+201%	-14%	+2%
Buildings	+190%	0%	-1%
Transport	+79%	+12%	+3%
Fuel Exploitation	+173%	-15%	+2%
Agriculture	+4%	+10%	+1%
Waste	+97%	+3%	0%
All sectors	+152%	-11%	+1%

Tunisia

GHG % in 2022



GHG emissions by sector

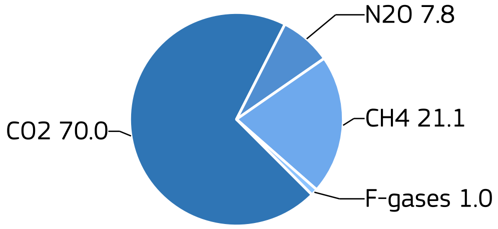


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	49.820	4.108	0.381	12.129M
2015	44.357	3.935	0.357	11.274M
2005	36.499	3.613	0.397	10.102M
1990	23.923	2.906	0.501	8.233M

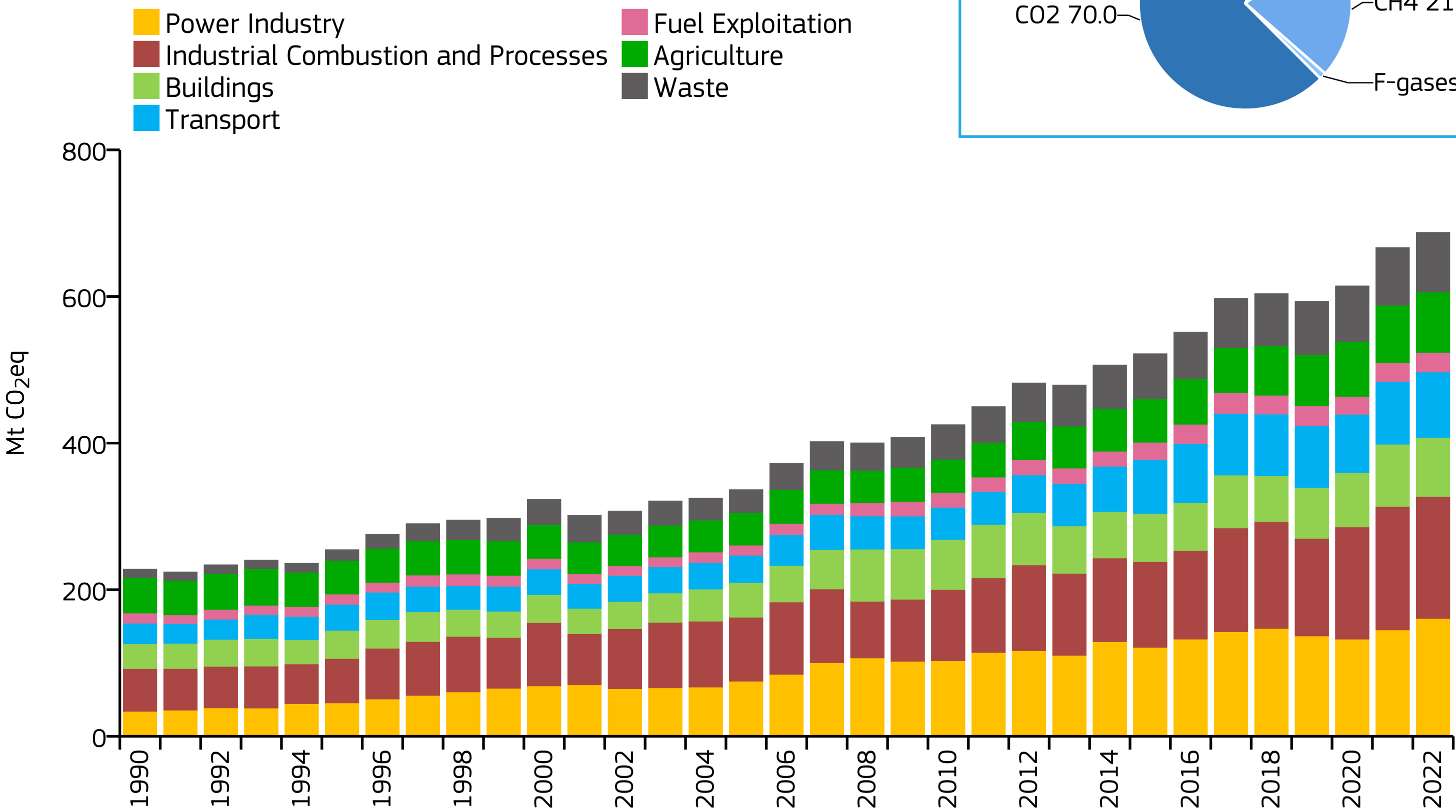
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+219%	+104%	+5%
Industrial Combustion and Processes	+71%	+24%	+2%
Buildings	+112%	+18%	+1%
Transport	+247%	+87%	0%
Fuel Exploitation	+59%	-6%	-2%
Agriculture	+9%	-13%	-1%
Waste	+79%	+25%	+1%
All sectors	+108%	+36%	+2%

Türkiye

GHG % in 2022



GHG emissions by sector

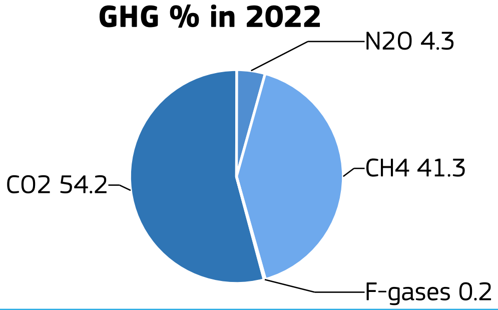


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	687.526	8.087	0.244	85.019M
2015	521.915	6.668	0.256	78.272M
2005	336.515	4.956	0.272	67.903M
1990	228.086	4.230	0.335	53.922M

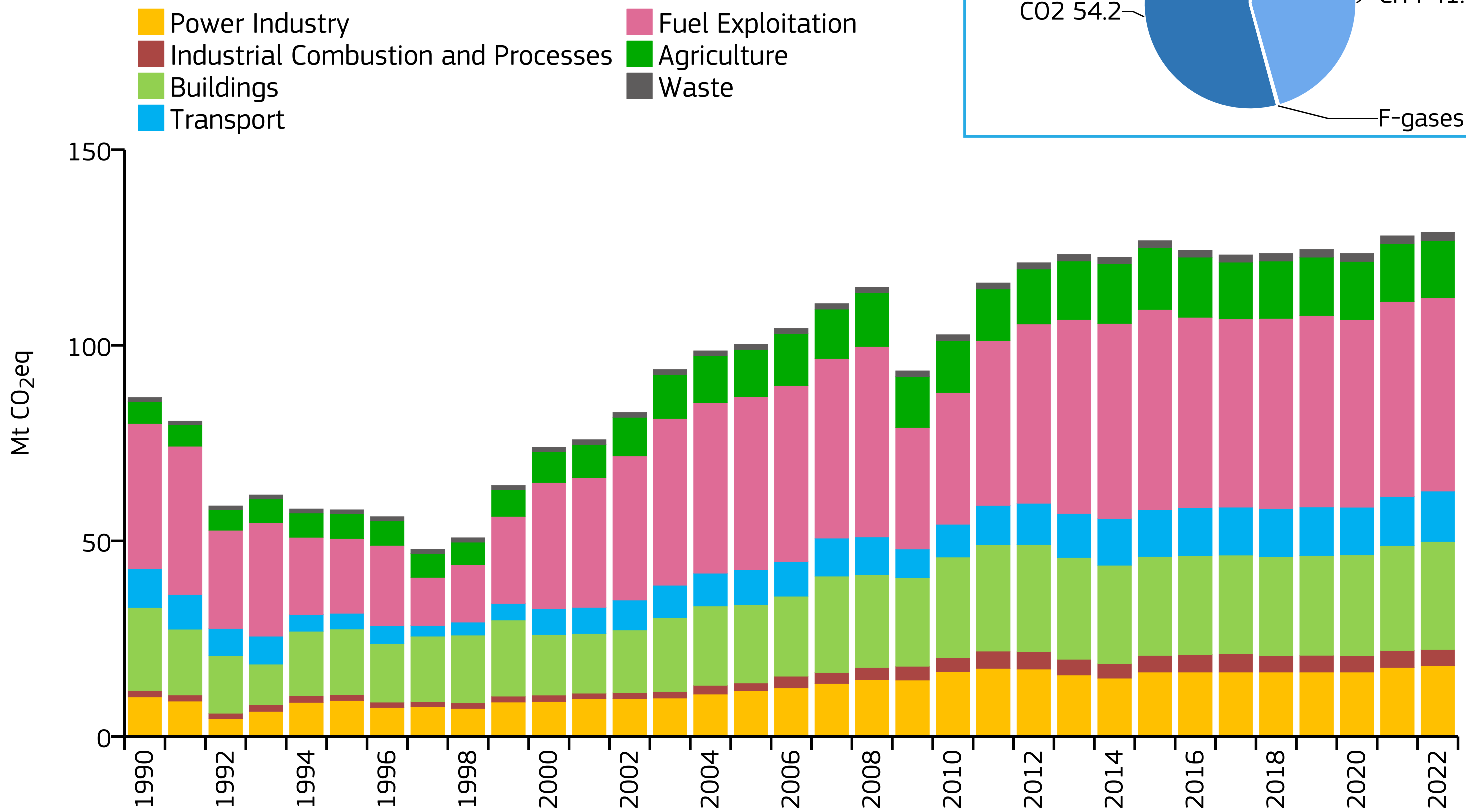
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+114%	+11%
Industrial Combustion and Processes	+186%	+90%	-1%
Buildings	+137%	+71%	-5%
Transport	+217%	+139%	+5%
Fuel Exploitation	+94%	+96%	+2%
Agriculture	+69%	+86%	+5%
Waste	> +300%	+158%	+4%
All sectors	+201%	+104%	+3%

Turkmenistan

GHG % in 2022



GHG emissions by sector

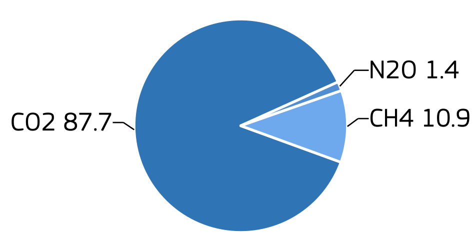


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	128.919	20.797	1.280	6.199M
2015	126.752	22.776	1.753	5.565M
2005	100.266	21.088	3.746	4.755M
1990	86.641	23.518	3.263	3.684M

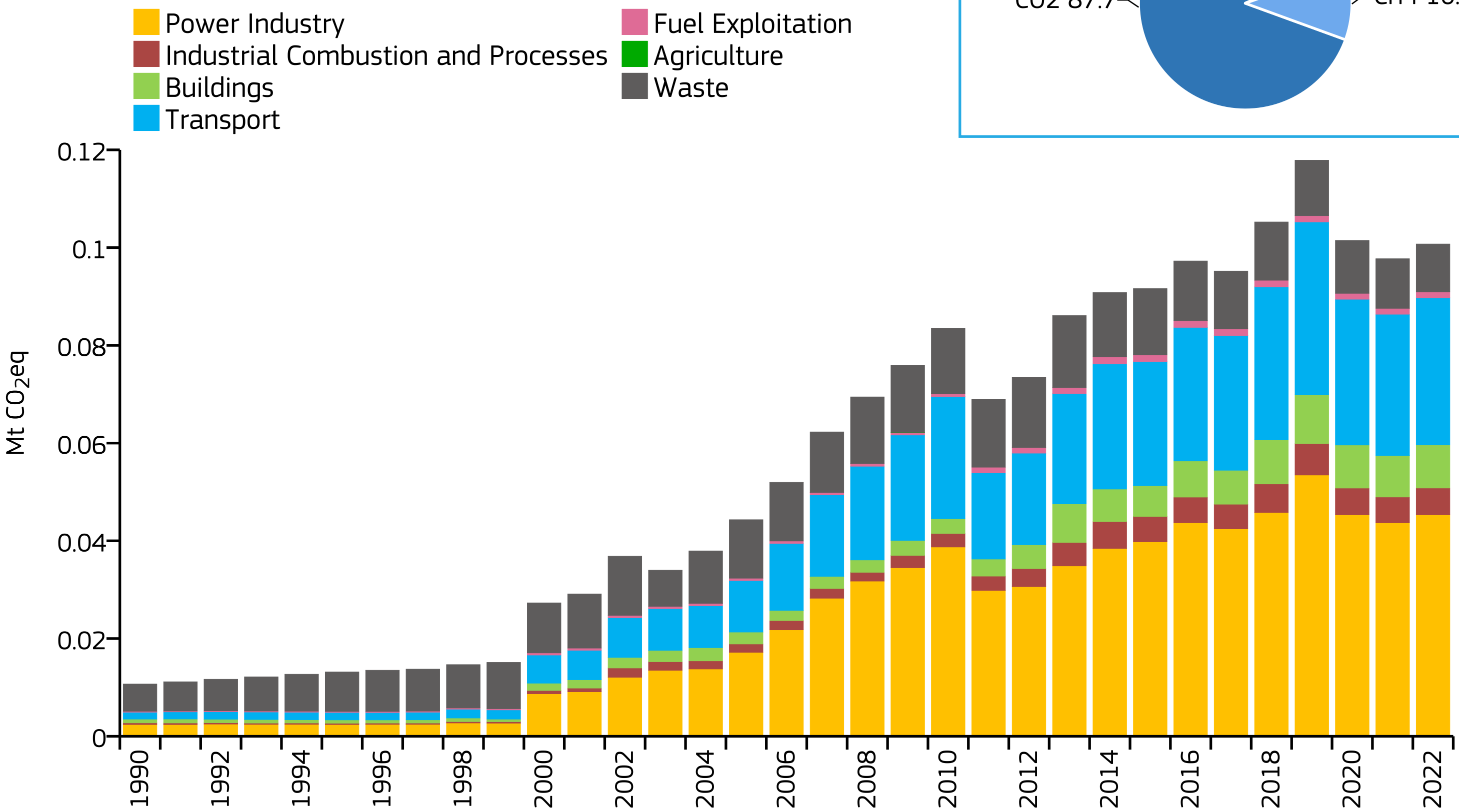
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+79%	+55%	+2%
Industrial Combustion and Processes	+156%	+108%	-3%
Buildings	+30%	+37%	+3%
Transport	+30%	+45%	+3%
Fuel Exploitation	+33%	+12%	-1%
Agriculture	+159%	+21%	0%
Waste	+113%	+62%	+2%
All sectors	+49%	+29%	+1%

Turks and Caicos Islands

GHG % in 2022



GHG emissions by sector

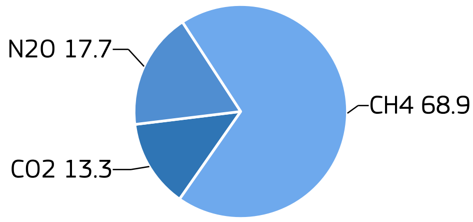


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.101	2.651	0.114	38.000k
2015	0.092	2.668	0.095	34.339k
2005	0.044	1.676	0.065	26.448k
1990	0.011	0.926	0.058	11.552k

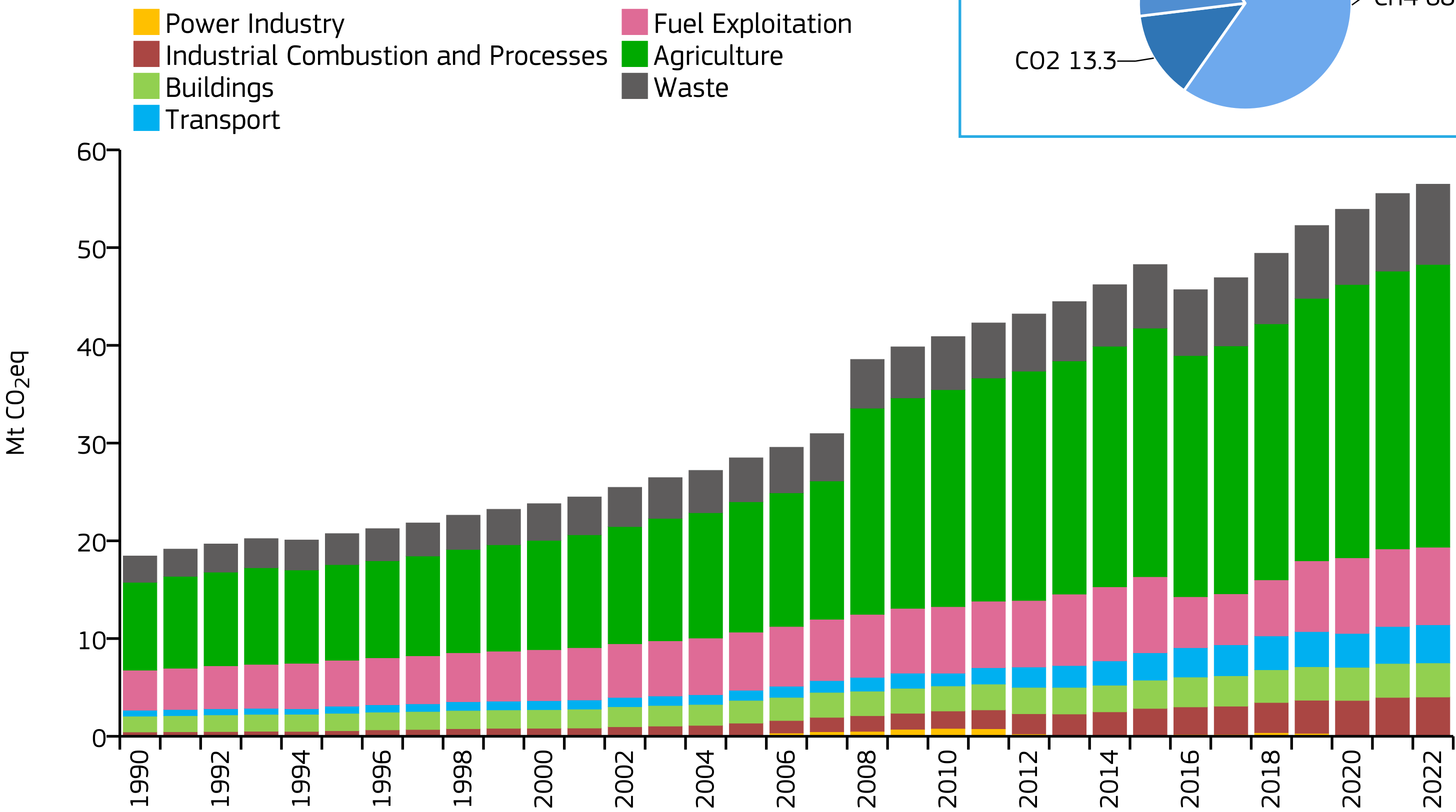
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+164%	+4%
Industrial Combustion and Processes	> +300%	+221%	+4%
Buildings	> +300%	+262%	+4%
Transport	> +300%	+186%	+4%
Fuel Exploitation	> +300%	+145%	0%
Agriculture	n/a	n/a	n/a
Waste	+76%	-18%	-4%
All sectors	> +300%	+127%	+3%

Uganda

GHG % in 2022



GHG emissions by sector

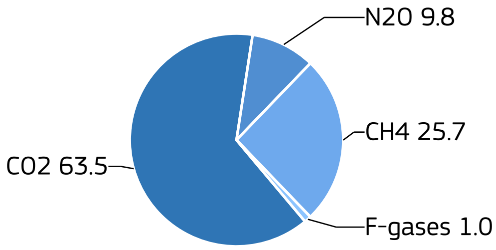


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	56.490	1.124	0.524	50.243M
2015	48.274	1.202	0.611	40.145M
2005	28.496	0.998	0.691	28.544M
1990	18.452	1.058	1.164	17.439M

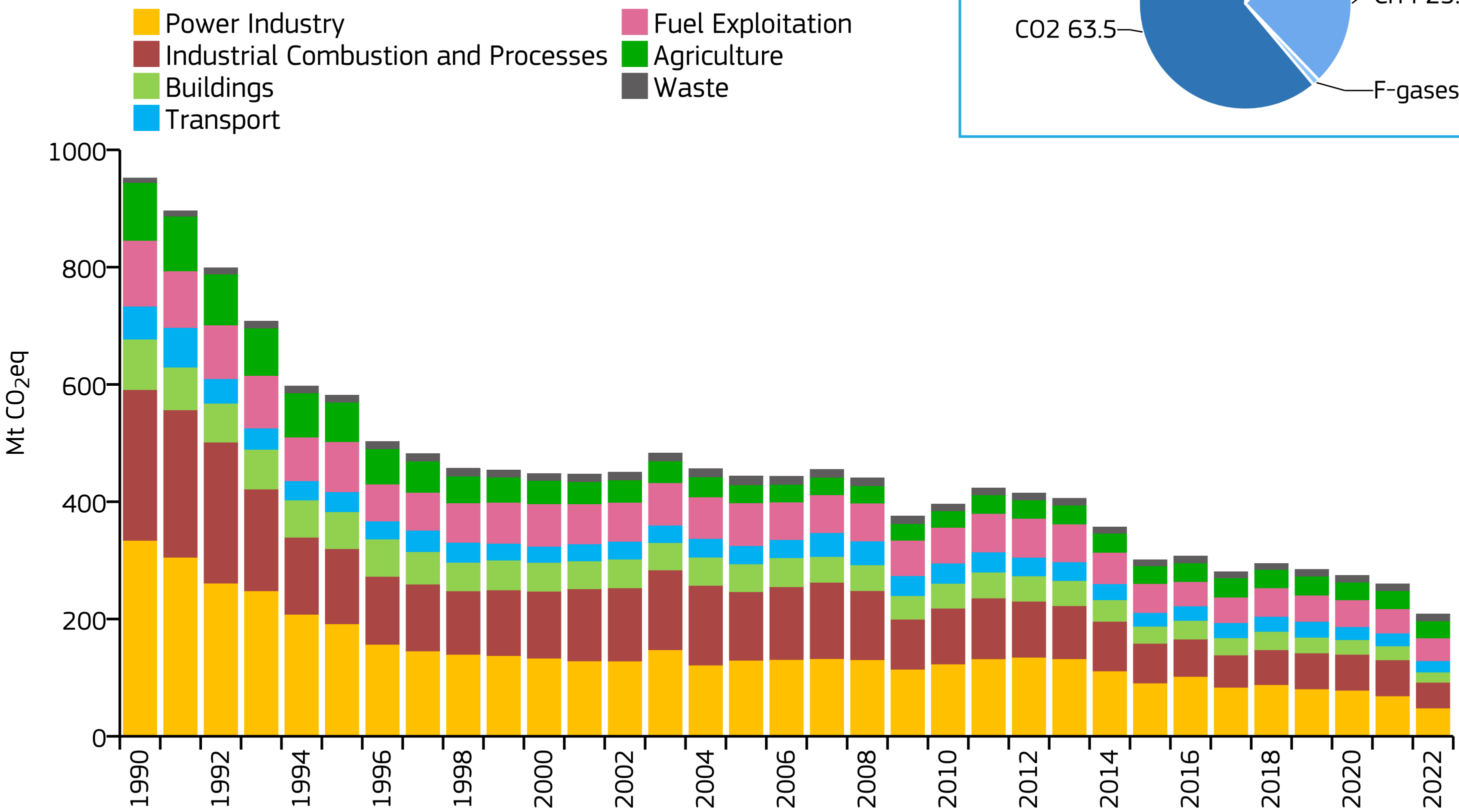
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	-9%	+2%
Industrial Combustion and Processes	> +300%	+210%	+1%
Buildings	+115%	+50%	0%
Transport	> +300%	+277%	+3%
Fuel Exploitation	+94%	+33%	0%
Agriculture	+222%	+117%	+2%
Waste	+204%	+83%	+3%
All sectors	+206%	+98%	+2%

Ukraine

GHG % in 2022



GHG emissions by sector

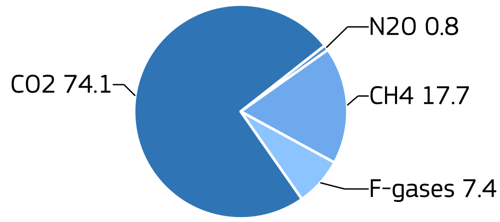


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	208.607	4.836	0.549	43.140M
2015	301.123	6.743	0.627	44.658M
2005	444.001	9.469	0.833	46.892M
1990	952.140	18.501	1.117	51.464M

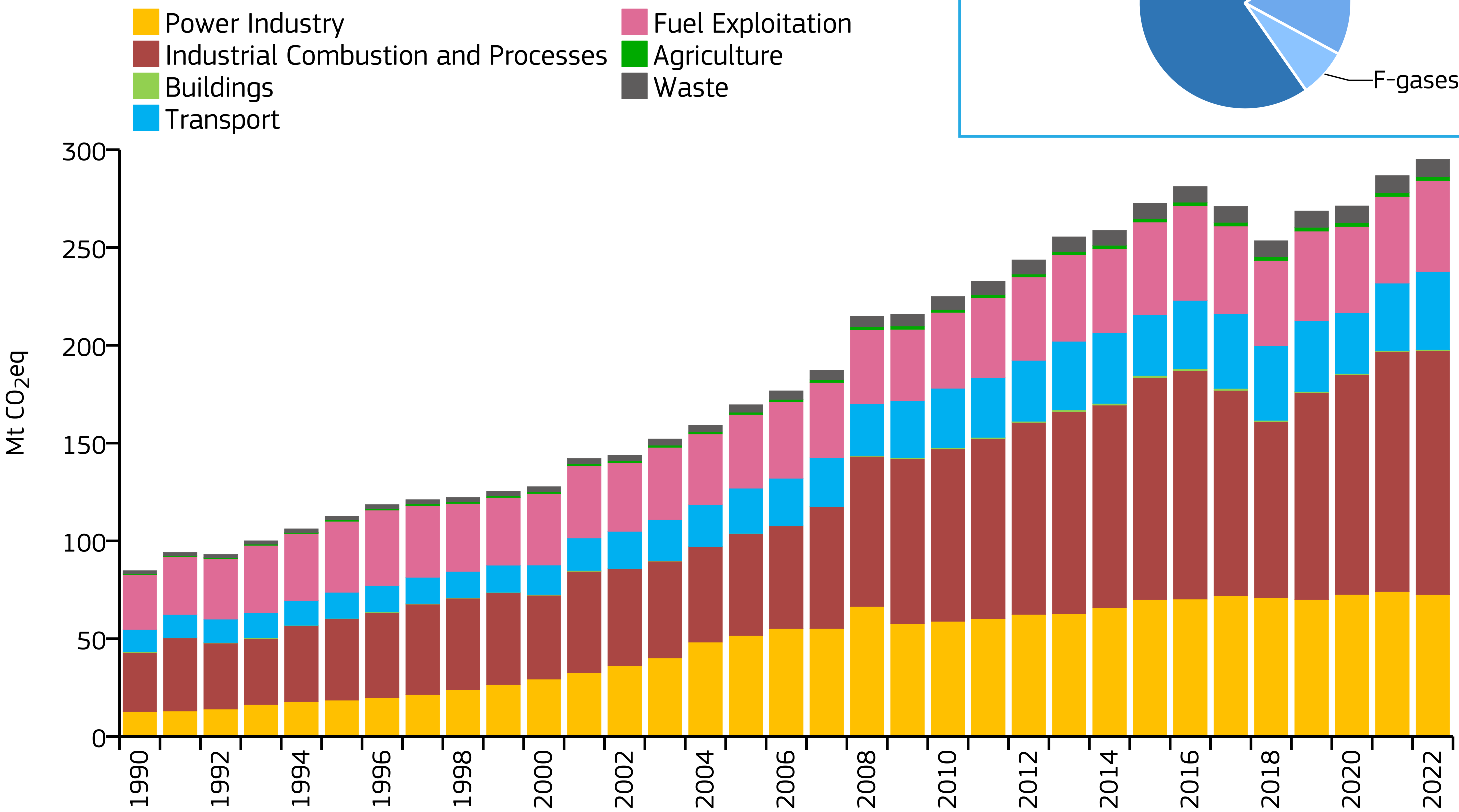
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-86%	-63%	-30%
Industrial Combustion and Processes	-83%	-63%	-29%
Buildings	-80%	-63%	-26%
Transport	-66%	-38%	-12%
Fuel Exploitation	-65%	-47%	-6%
Agriculture	-71%	-6%	-6%
Waste	+50%	-22%	+1%
All sectors	-78%	-53%	-20%

United Arab Emirates

GHG % in 2022



GHG emissions by sector

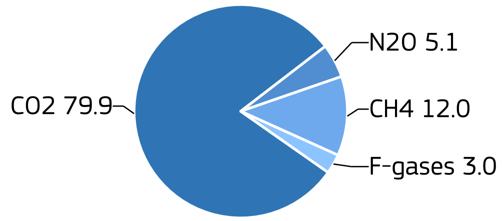


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	295.110	29.332	0.421	10.061M
2015	272.732	29.793	0.449	9.154M
2005	169.629	37.040	0.412	4.580M
1990	84.787	45.580	0.421	1.860M

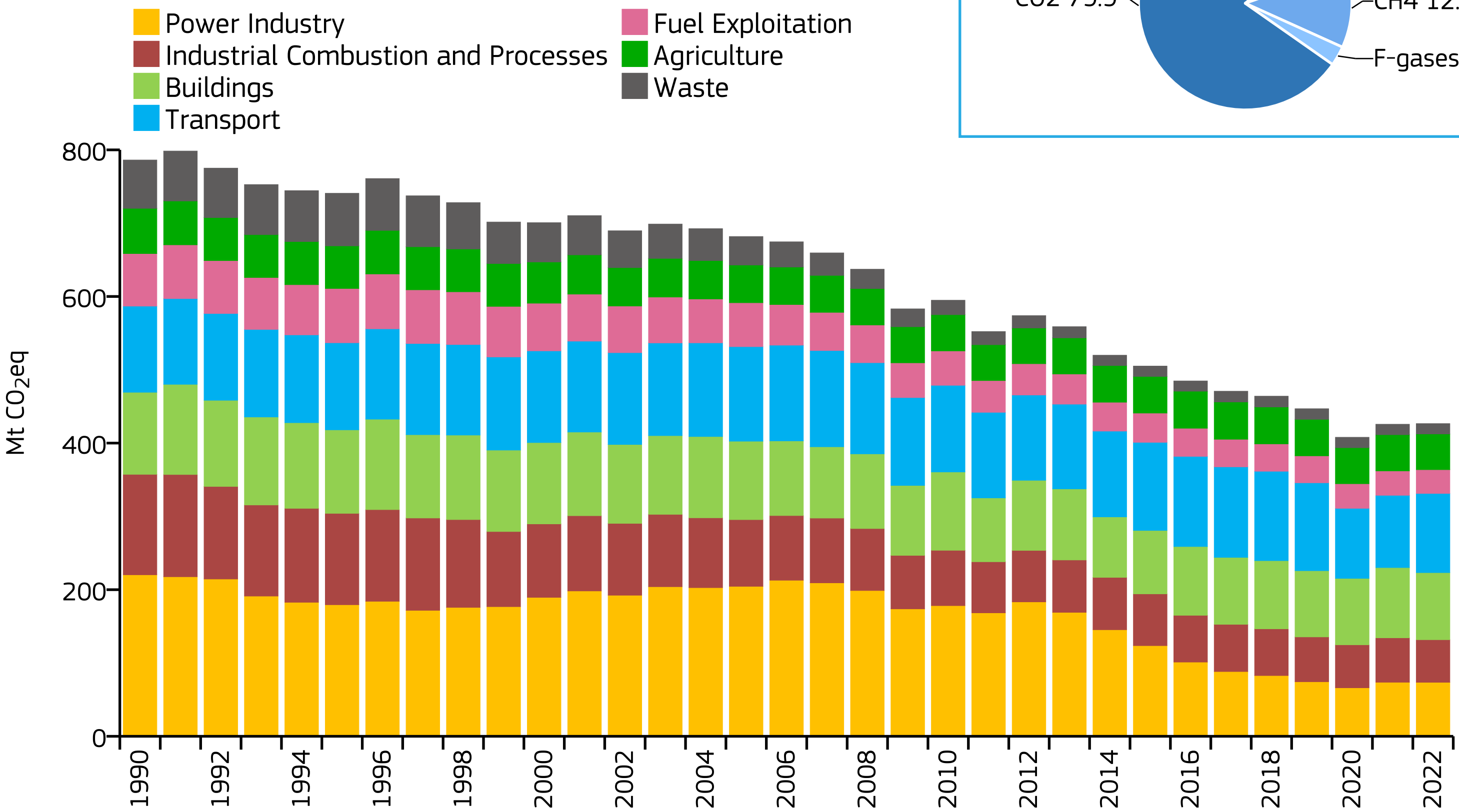
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	+41%	-2%
Industrial Combustion and Processes	> +300%	+139%	+2%
Buildings	+126%	> +300%	+14%
Transport	+248%	+73%	+16%
Fuel Exploitation	+66%	+23%	+5%
Agriculture	> +300%	+65%	+1%
Waste	> +300%	+132%	+2%
All sectors	+248%	+74%	+3%

United Kingdom

GHG % in 2022



GHG emissions by sector

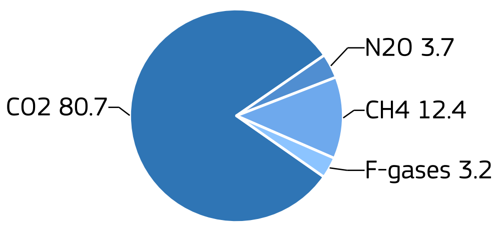


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	426.562	6.268	0.136	68.057M
2015	505.060	7.723	0.174	65.397M
2005	681.823	11.310	0.264	60.287M
1990	786.212	13.749	0.439	57.183M

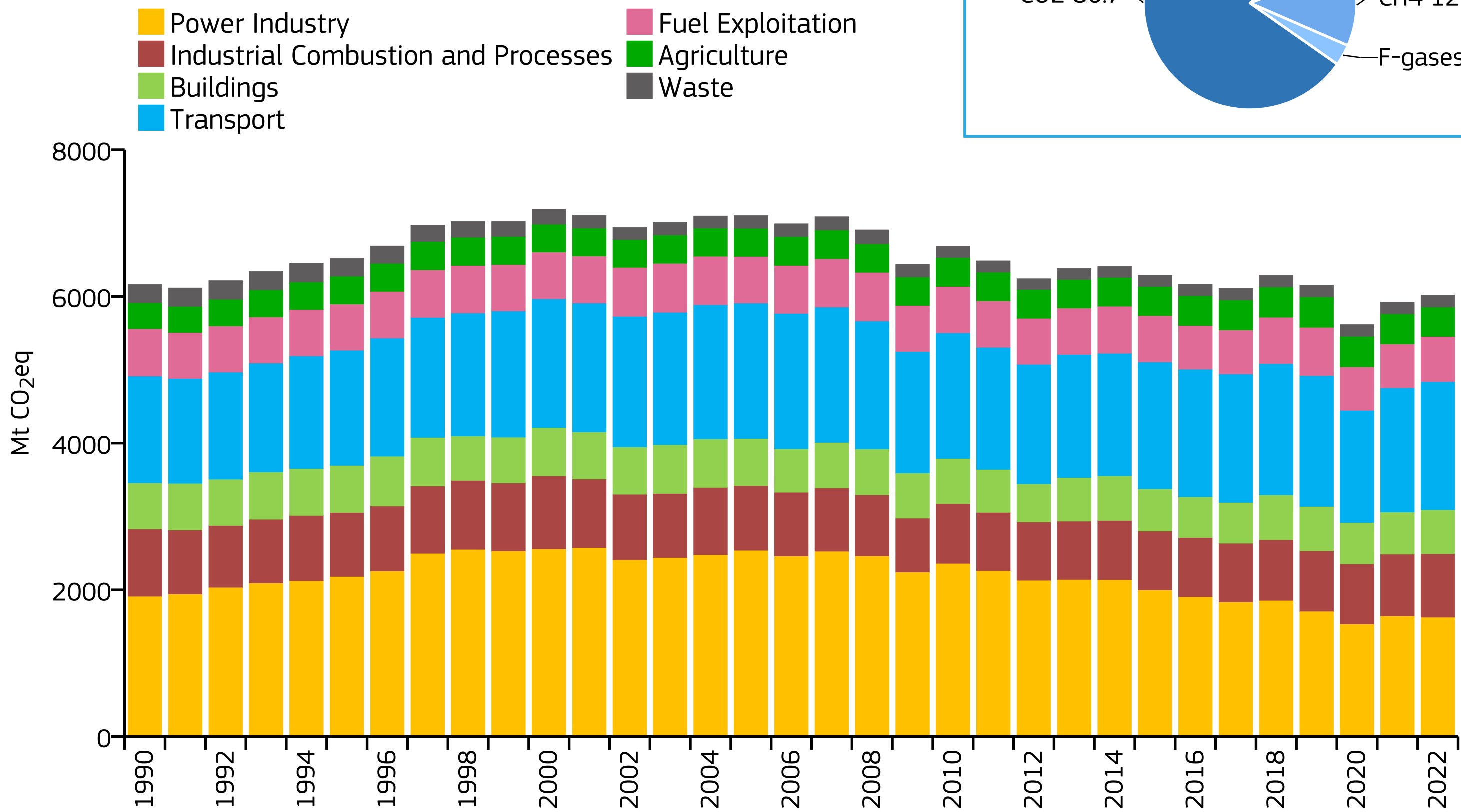
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-67%	-64%	0%
Industrial Combustion and Processes	-58%	-36%	-4%
Buildings	-18%	-15%	-5%
Transport	-8%	-16%	+9%
Fuel Exploitation	-55%	-46%	-2%
Agriculture	-21%	-5%	-2%
Waste	-79%	-64%	-1%
All sectors	-46%	-37%	0%

United States

GHG % in 2022



GHG emissions by sector

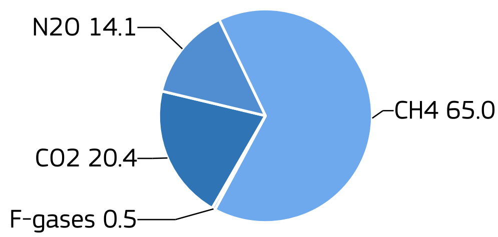


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	6017.443	17.901	0.279	336.150M
2015	6288.541	19.656	0.336	319.929M
2005	7101.881	24.064	0.442	295.130M
1990	6163.742	24.408	0.610	252.530M

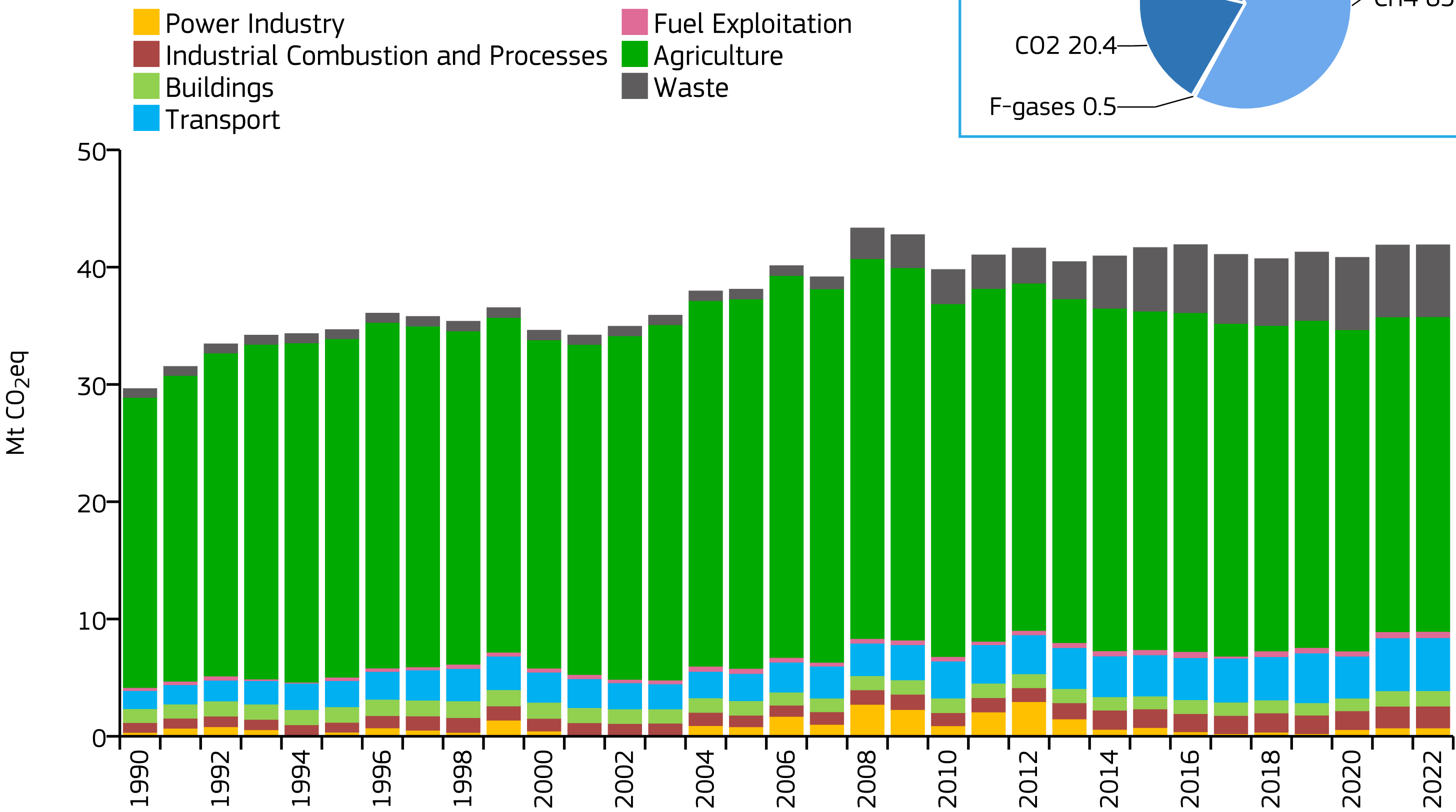
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-15%	-36%	-1%
Industrial Combustion and Processes	-6%	-2%	+3%
Buildings	-5%	-7%	+5%
Transport	+20%	-5%	+3%
Fuel Exploitation	-4%	-3%	+3%
Agriculture	+14%	+5%	-2%
Waste	-35%	-6%	+1%
All sectors	-2%	-15%	+2%

Uruguay

GHG % in 2022



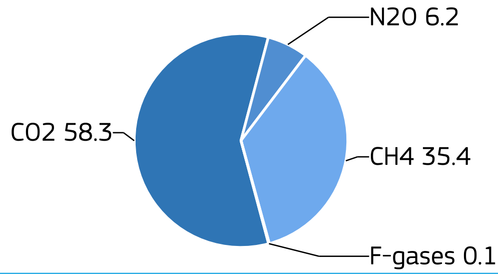
GHG emissions by sector



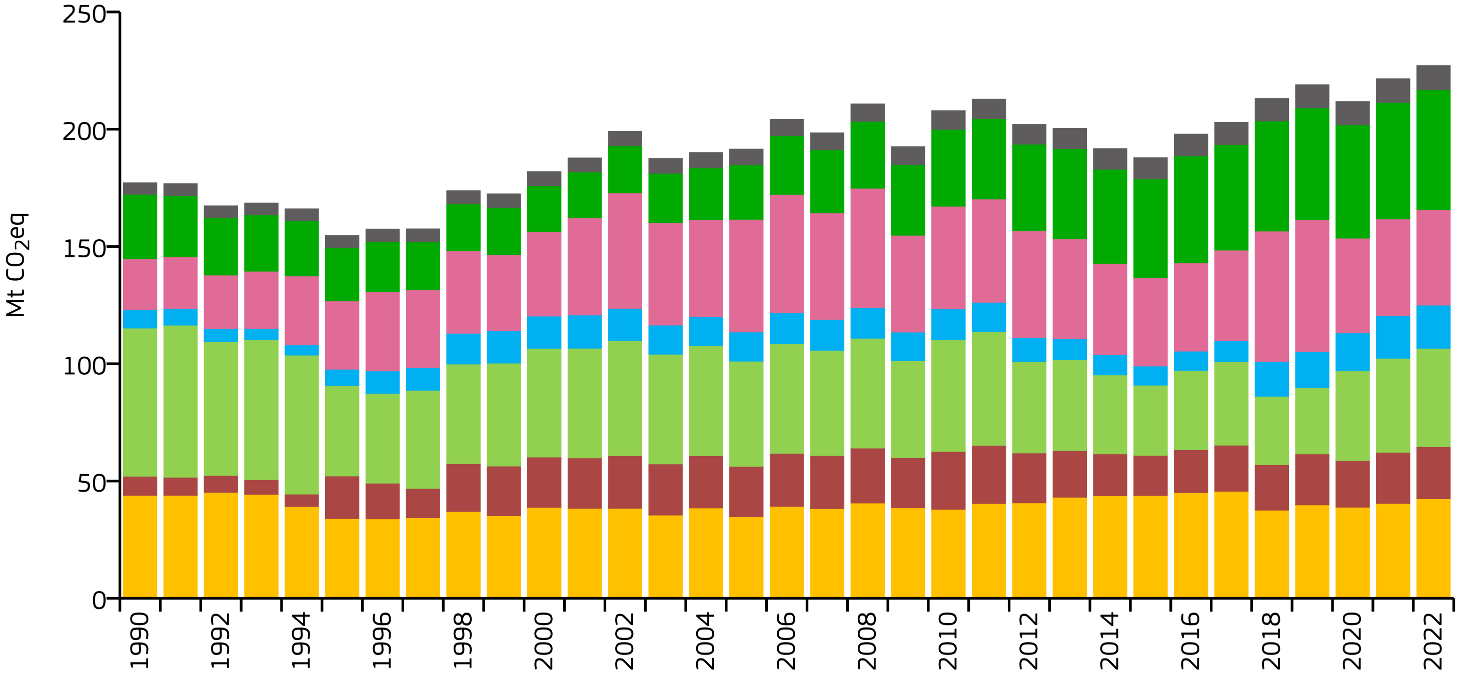
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	41.908	11.912	0.501	3.518M
2015	41.680	12.146	0.539	3.432M
2005	38.125	11.464	0.777	3.326M
1990	29.649	9.533	0.856	3.110M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+119%	-12%	0%
Industrial Combustion and Processes	+122%	+89%	+1%
Buildings	+11%	+6%	0%
Transport	+192%	+95%	0%
Fuel Exploitation	+103%	+23%	0%
Agriculture	+8%	-15%	0%
Waste	> +300%	> +300%	0%
All sectors	+41%	+10%	0%

Uzbekistan



GHG emissions by sector

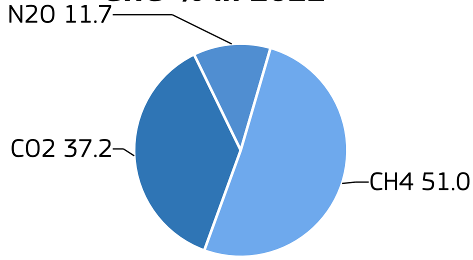


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	227.207	6.673	0.789	34.047M
2015	187.886	6.066	0.938	30.976M
2005	191.579	7.226	2.019	26.512M
1990	177.173	8.658	2.374	20.462M

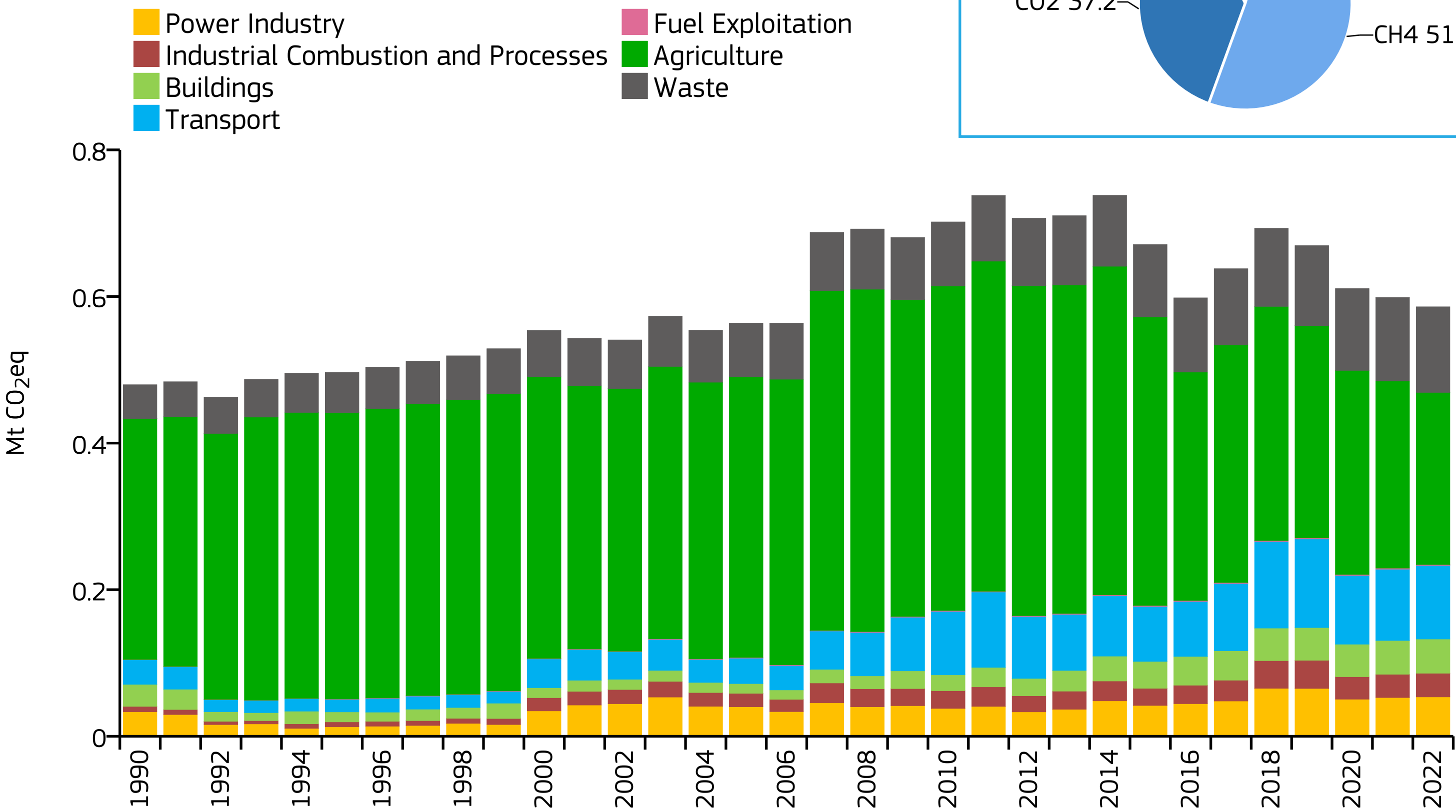
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-3%	+22%	+5%
Industrial Combustion and Processes	+172%	+3%	+2%
Buildings	-34%	-6%	+5%
Transport	+135%	+48%	+2%
Fuel Exploitation	+88%	-15%	-1%
Agriculture	+86%	+120%	+3%
Waste	+109%	+53%	+2%
All sectors	+28%	+19%	+3%

Vanuatu

GHG % in 2022



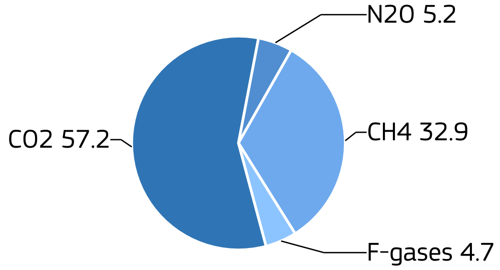
GHG emissions by sector



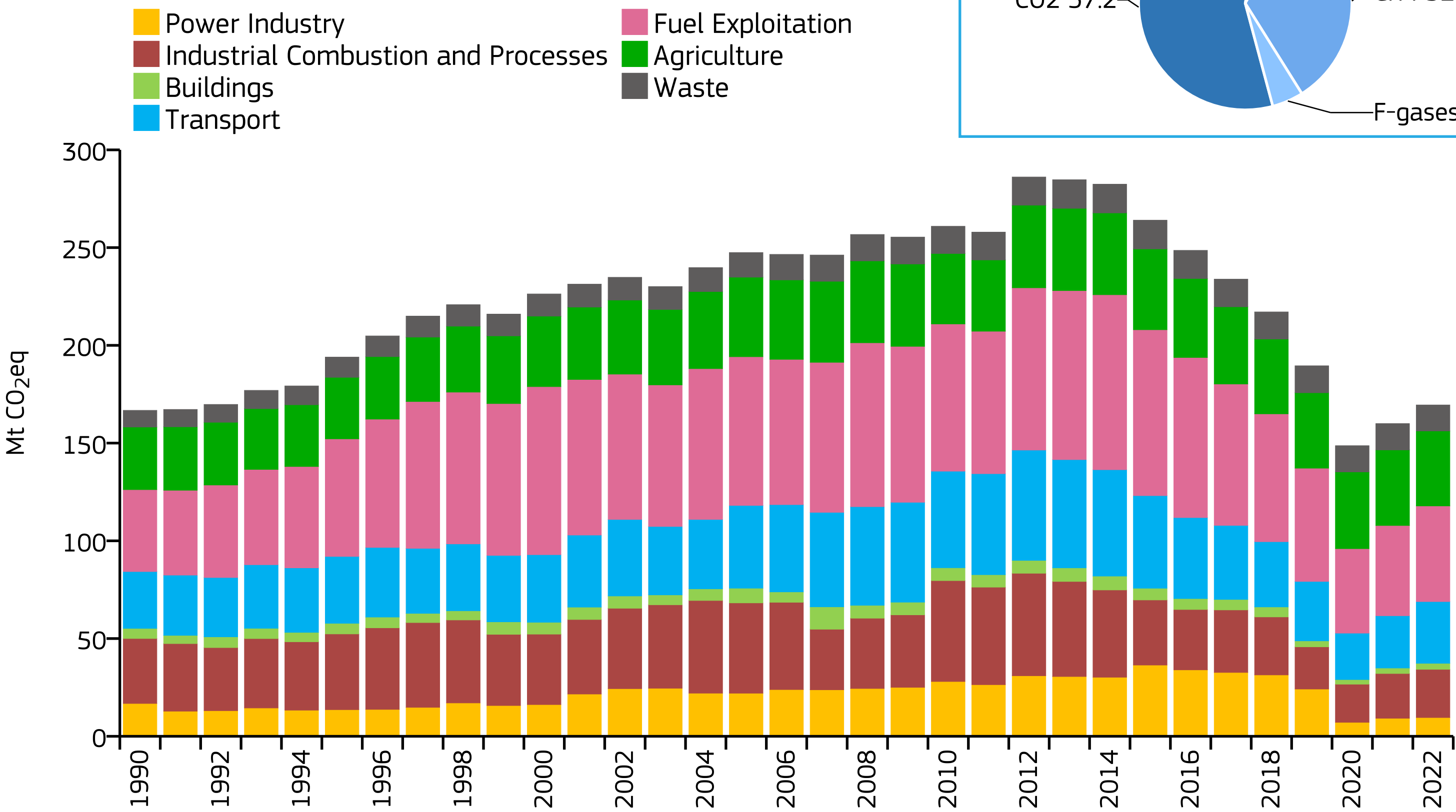
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.586	1.915	0.644	306.000k
2015	0.671	2.535	0.849	264.603k
2005	0.564	2.692	0.950	209.370k
1990	0.480	3.271	1.146	146.634k

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+61%	+34%	+2%
Industrial Combustion and Processes	> +300%	+76%	+2%
Buildings	+54%	+252%	+1%
Transport	+200%	+189%	+3%
Fuel Exploitation	+298%	+61%	0%
Agriculture	-29%	-39%	-8%
Waste	+153%	+59%	+2%
All sectors	+22%	+4%	-2%

Venezuela



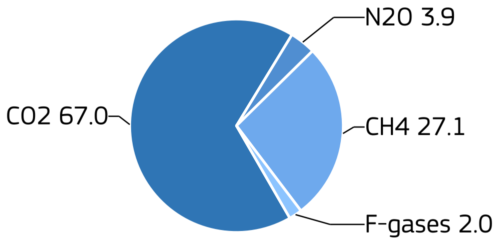
GHG emissions by sector



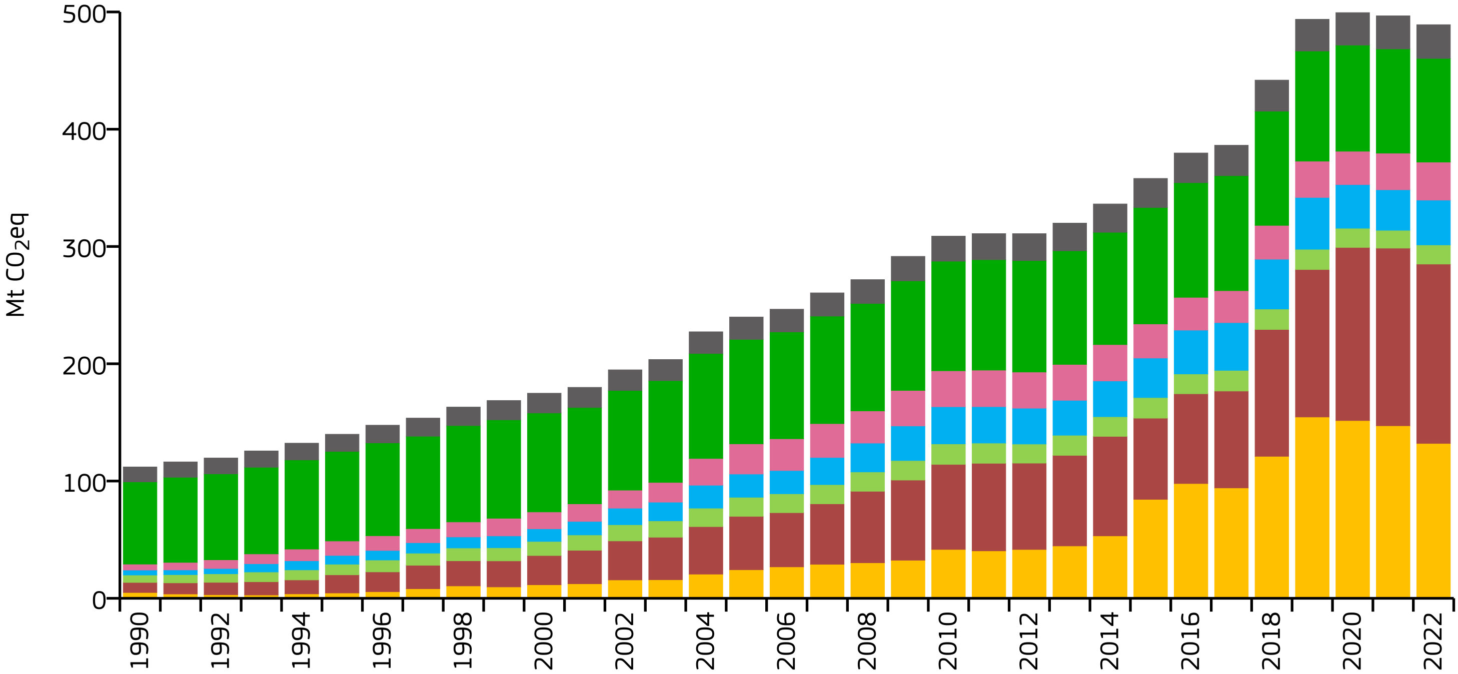
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	169.517	4.995	1.024	33.938M
2015	264.025	8.475	0.492	31.155M
2005	247.491	9.240	0.556	26.784M
1990	166.755	8.396	0.523	19.862M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-43%	-57%	+4%
Industrial Combustion and Processes	-26%	-47%	+8%
Buildings	-40%	-59%	+11%
Transport	+9%	-25%	+18%
Fuel Exploitation	+17%	-36%	+6%
Agriculture	+20%	-6%	-1%
Waste	+56%	+5%	-1%
All sectors	+2%	-32%	+6%

Vietnam



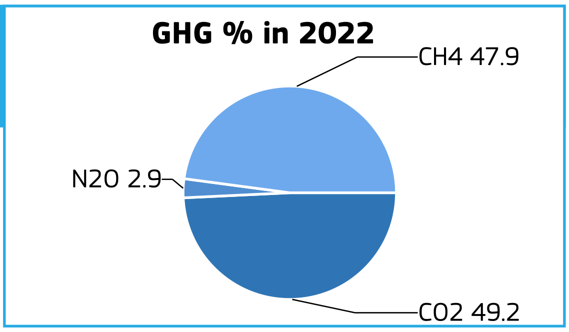
GHG emissions by sector



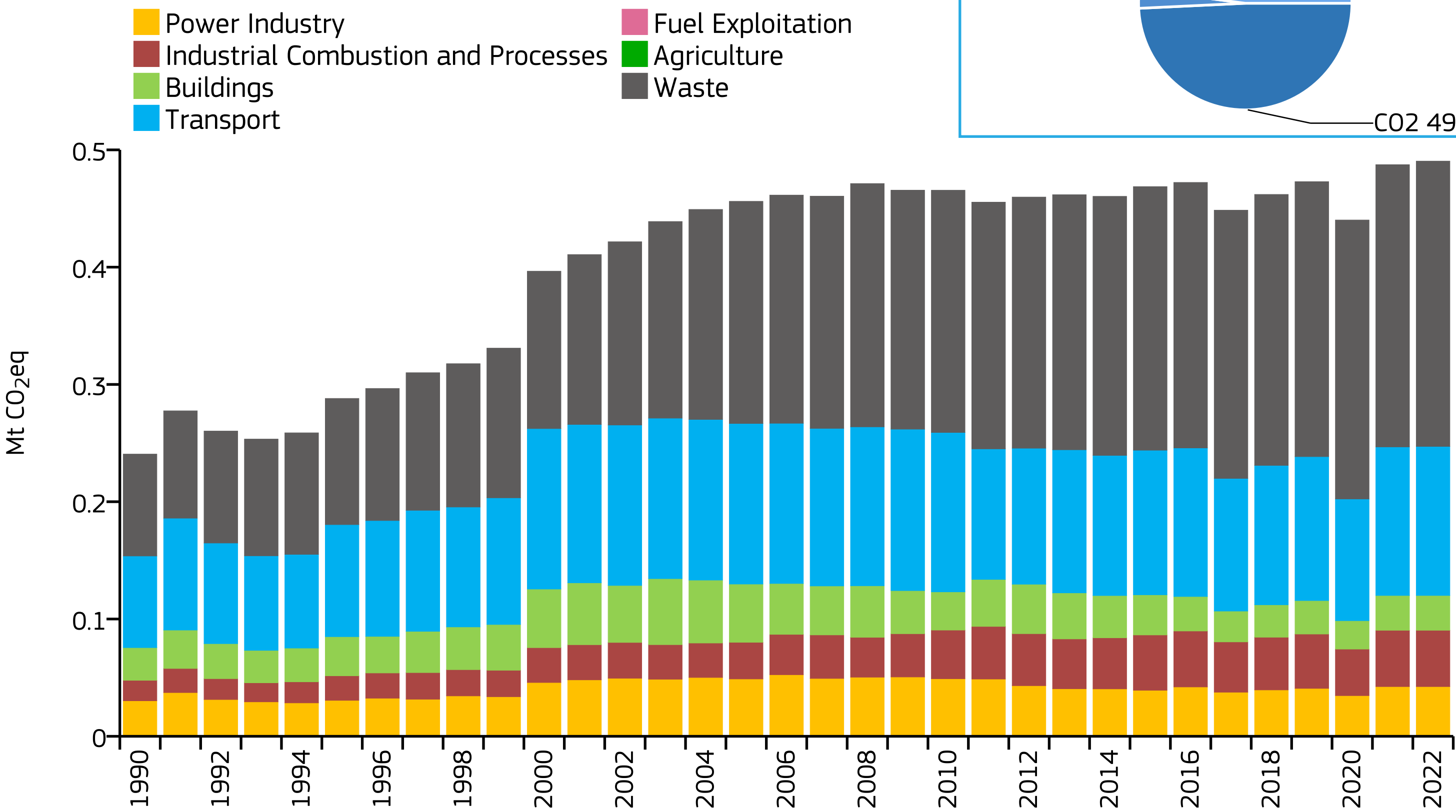
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	489.159	4.882	0.437	100.195M
2015	358.062	3.827	0.480	93.572M
2005	239.900	2.845	0.589	84.309M
1990	112.021	1.642	0.797	68.210M

Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	-10%
Industrial Combustion and Processes	> +300%	+236%	+1%
Buildings	+159%	0%	+7%
Transport	> +300%	+93%	+11%
Fuel Exploitation	> +300%	+26%	+4%
Agriculture	+26%	-1%	-1%
Waste	+126%	+51%	+2%
All sectors	> +300%	+104%	-2%

Western Sahara



GHG emissions by sector

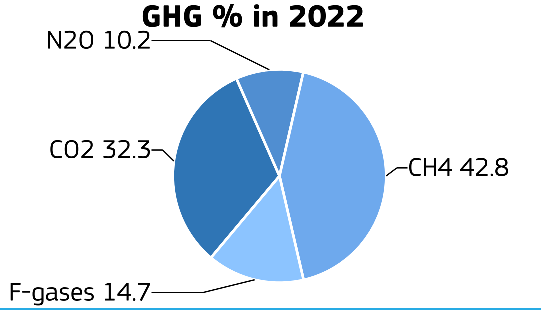


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	0.490	0.783	n/a	626.000k
2015	0.469	0.891	n/a	526.216k
2005	0.456	1.043	n/a	437.515k
1990	0.241	1.108	n/a	217.258k

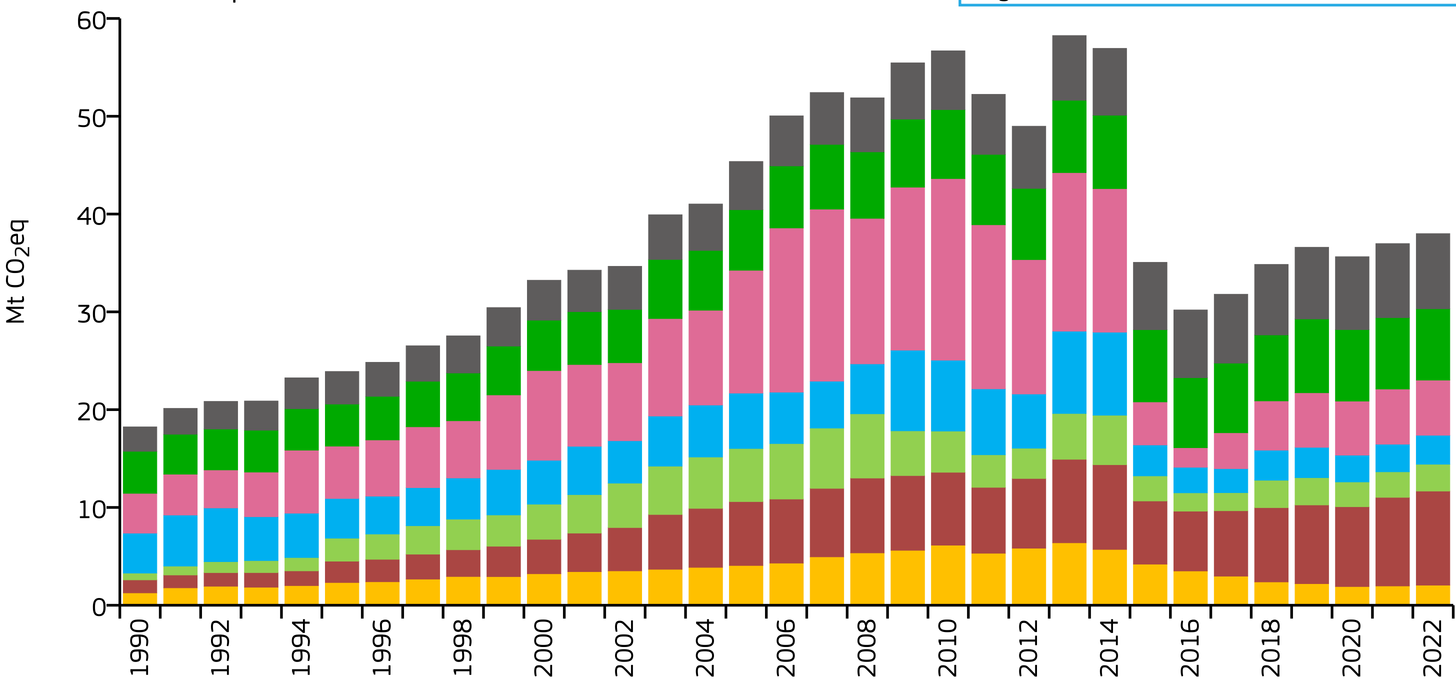
	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+40%	-13%	0%
Industrial Combustion and Processes	+175%	+54%	0%
Buildings	+6%	-40%	0%
Transport	+63%	-7%	0%
Fuel Exploitation	n/a	n/a	n/a
Agriculture	n/a	n/a	n/a
Waste	+180%	+28%	+1%
All sectors	+104%	+8%	+1%

Yemen

GHG % in 2022



GHG emissions by sector

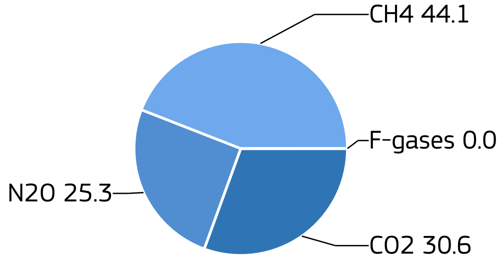


Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	38.006	1.204	0.315	31.576M
2015	35.067	1.303	0.319	26.916M
2005	45.379	2.205	0.497	20.583M
1990	18.242	1.513	0.426	12.057M

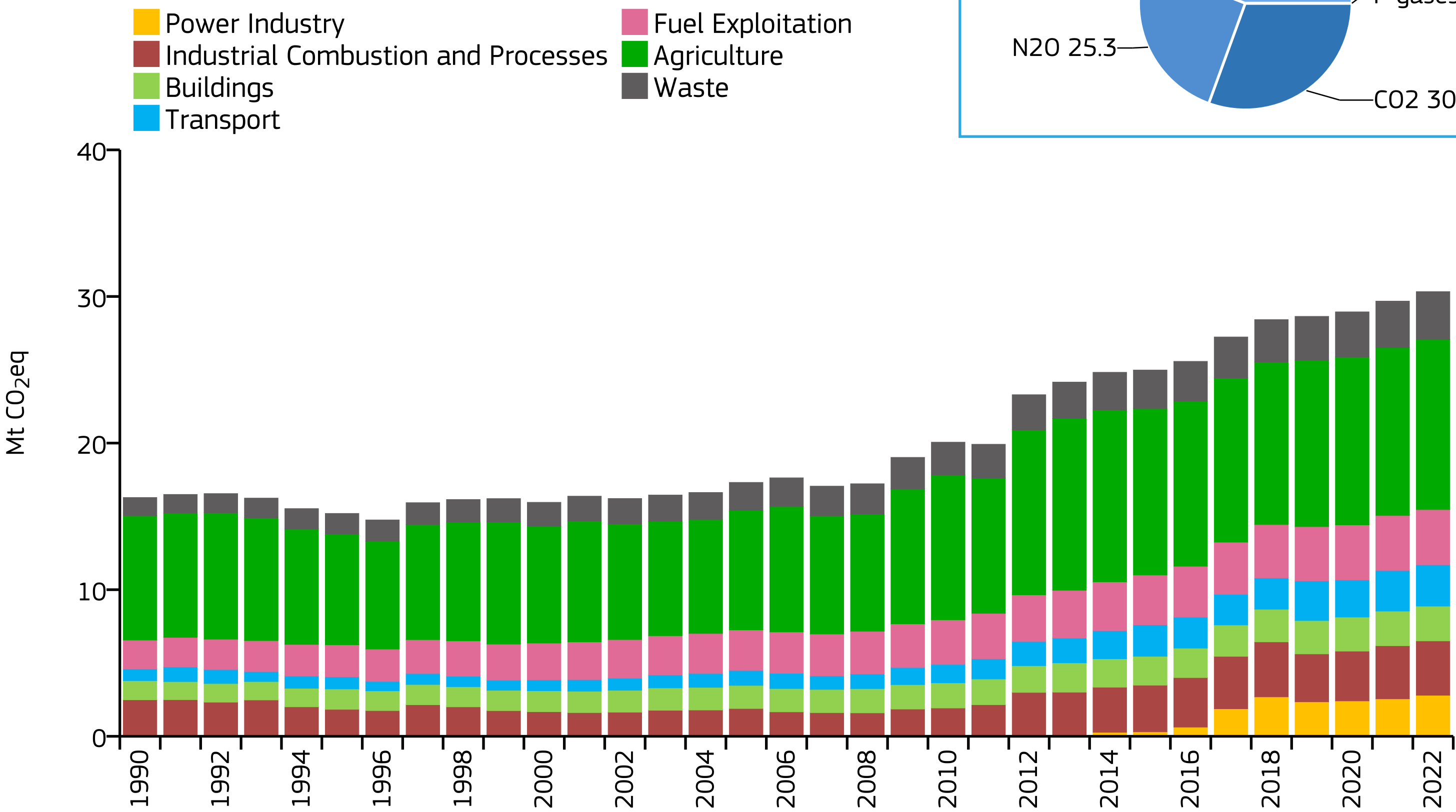
Sector	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	+63%	-50%	+4%
Industrial Combustion and Processes	> +300%	+47%	+6%
Buildings	+293%	-50%	+5%
Transport	-28%	-48%	+5%
Fuel Exploitation	+39%	-55%	0%
Agriculture	+70%	+18%	0%
Waste	+207%	+56%	+2%
All sectors	+108%	-16%	+3%

Zambia

GHG % in 2022



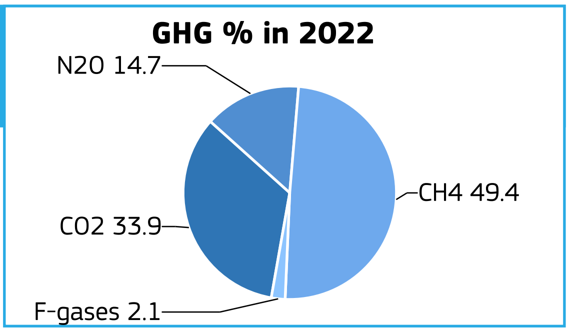
GHG emissions by sector



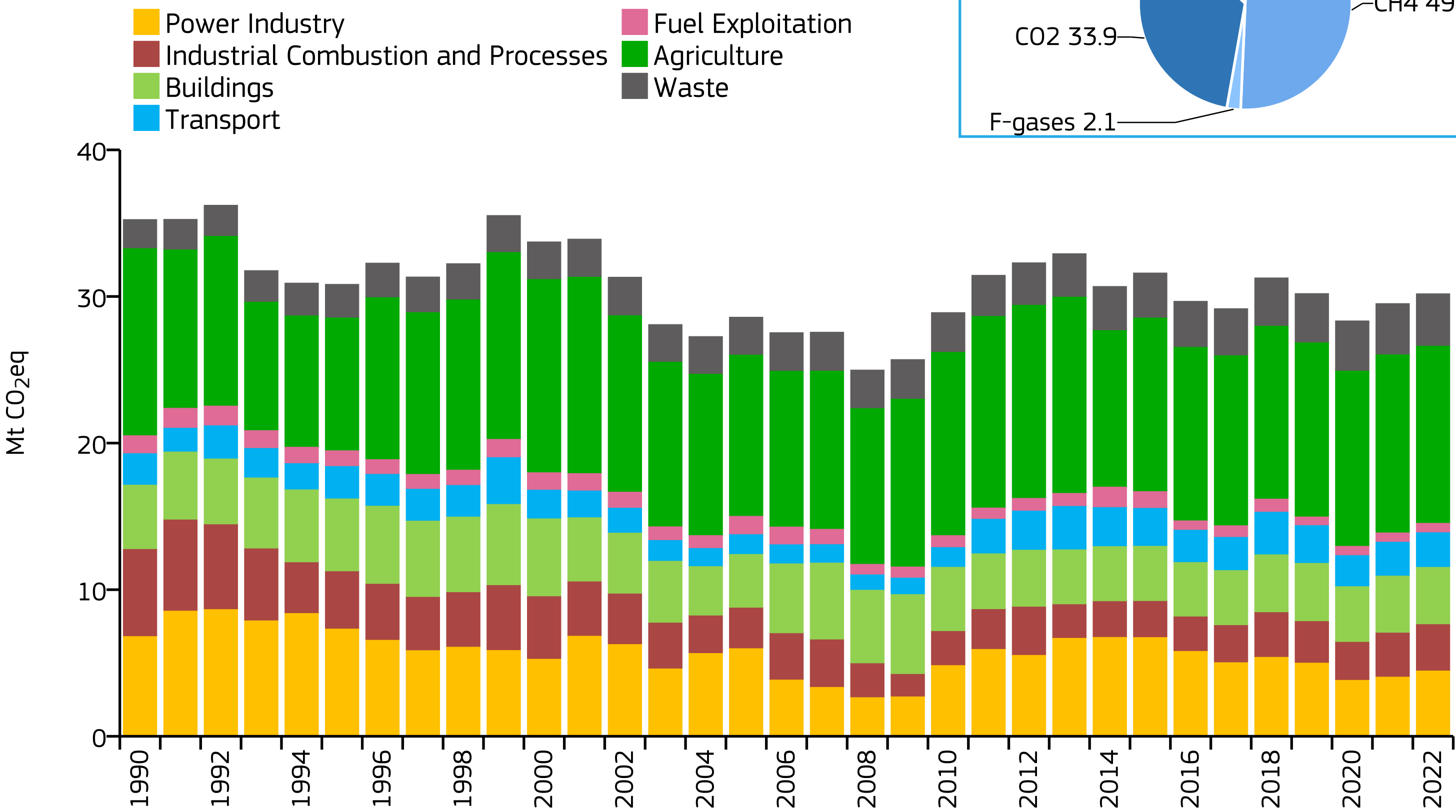
Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	30.331	1.532	0.459	19.803M
2015	24.987	1.552	0.457	16.100M
2005	17.321	1.437	0.618	12.053M
1990	16.287	2.029	0.925	8.027M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	> +300%	> +300%	+10%
Industrial Combustion and Processes	+55%	+102%	+2%
Buildings	+81%	+51%	0%
Transport	+256%	+178%	+2%
Fuel Exploitation	+90%	+36%	0%
Agriculture	+37%	+42%	+1%
Waste	+163%	+71%	+3%
All sectors	+86%	+75%	+2%

Zimbabwe



GHG emissions by sector



Year	GHG emissions Mt CO_2eq/yr	GHG emissions per capita t CO_2eq/cap/yr	GHG emissions per unit of GDP PPP t CO_2eq/kUSD/yr	Population
2022	30.190	1.637	0.863	18.438M
2015	31.610	2.004	0.965	15.777M
2005	28.593	2.210	1.289	12.940M
1990	35.256	3.462	1.289	10.183M

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-34%	-25%	+10%
Industrial Combustion and Processes	-47%	+14%	+5%
Buildings	-11%	+7%	+1%
Transport	+10%	+75%	+2%
Fuel Exploitation	-48%	-49%	+1%
Agriculture	-5%	+10%	0%
Waste	+82%	+39%	+2%
All sectors	-14%	+6%	+2%

Annex 7. GHG emissions and removals from LULUCF sector by macro-regions

The following ten macro-regions[46] are presented:

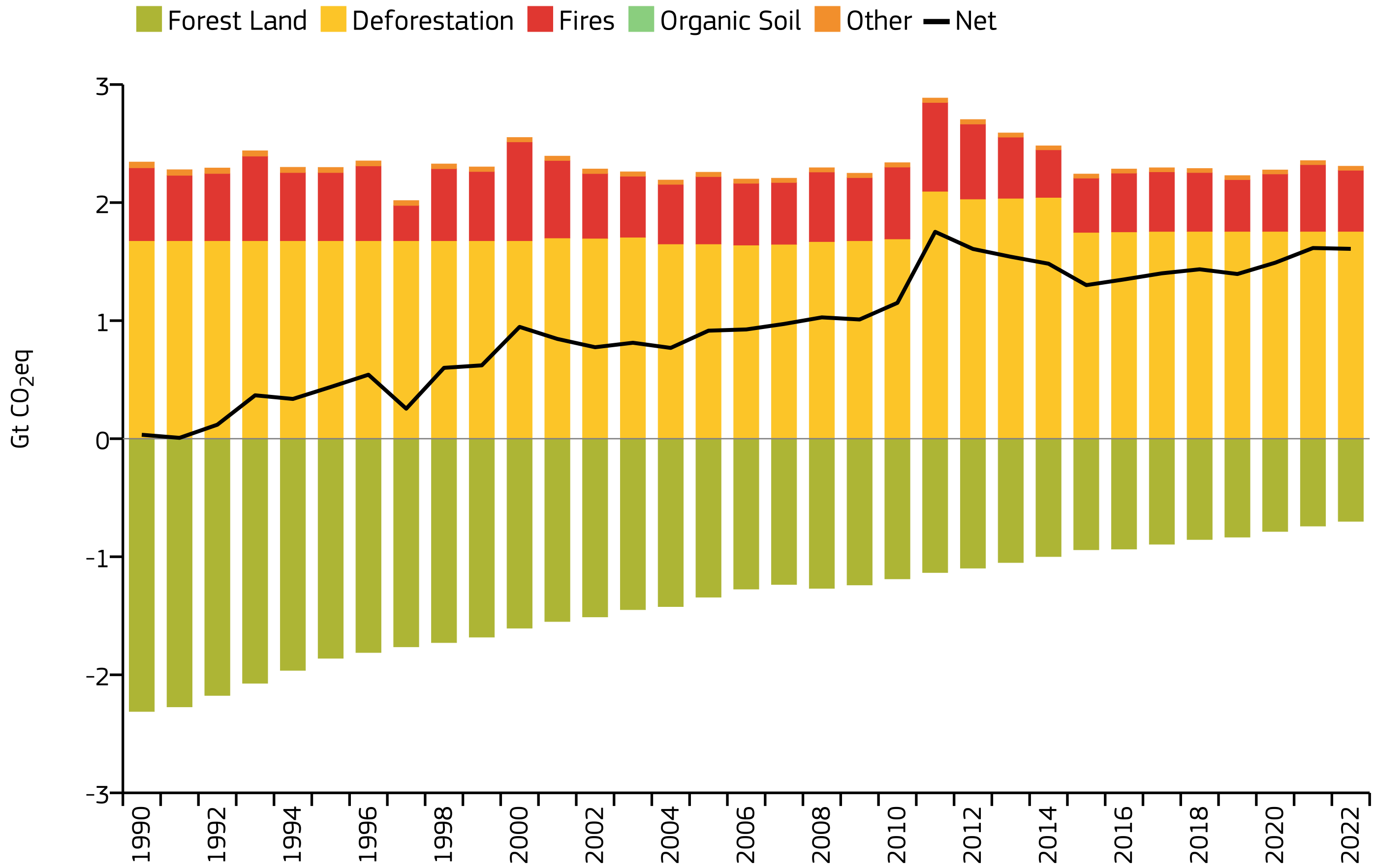
Africa, Asia-Pacific Developed, Eastern Asia, Eurasia, Europe, Latin America and Caribbean, Middle East, North America, South-East Asia and developing Pacific, Southern Asia.

The following LULUCF sectors are included:

Forest Land, Deforestation, Organic Soil, Other and Fires.

([46]) Macro regions classification follows the definition used in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6).

GHG emissions and removals from LULUCF sector



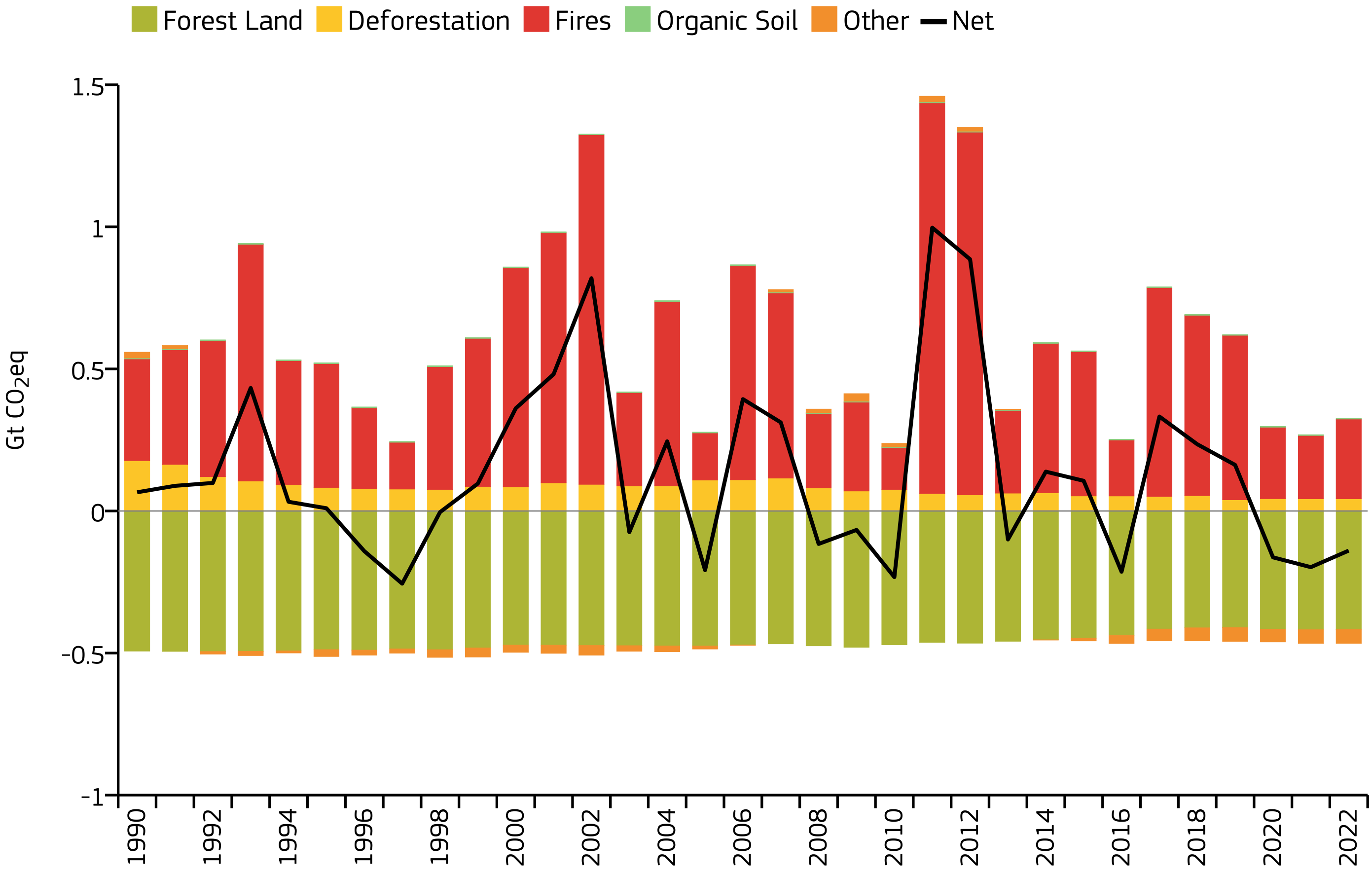
Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	0.033	0.947	1.301	1.608

Countries included in Africa:

Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Congo; Côte d'Ivoire; Democratic Republic of the Congo; Djibouti; Egypt; Equatorial Guinea; Eritrea; Eswatini; Ethiopia; Gabon; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Rwanda; Réunion; Saint Helena, Ascension and Tristan da Cunha; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; Sudan and South Sudan; São Tomé and Príncipe; Tanzania; The Gambia; Togo; Tunisia; Uganda; Western Sahara; Zambia; Zimbabwe.

Asia-Pacific Developed

GHG emissions and removals from LULUCF sector

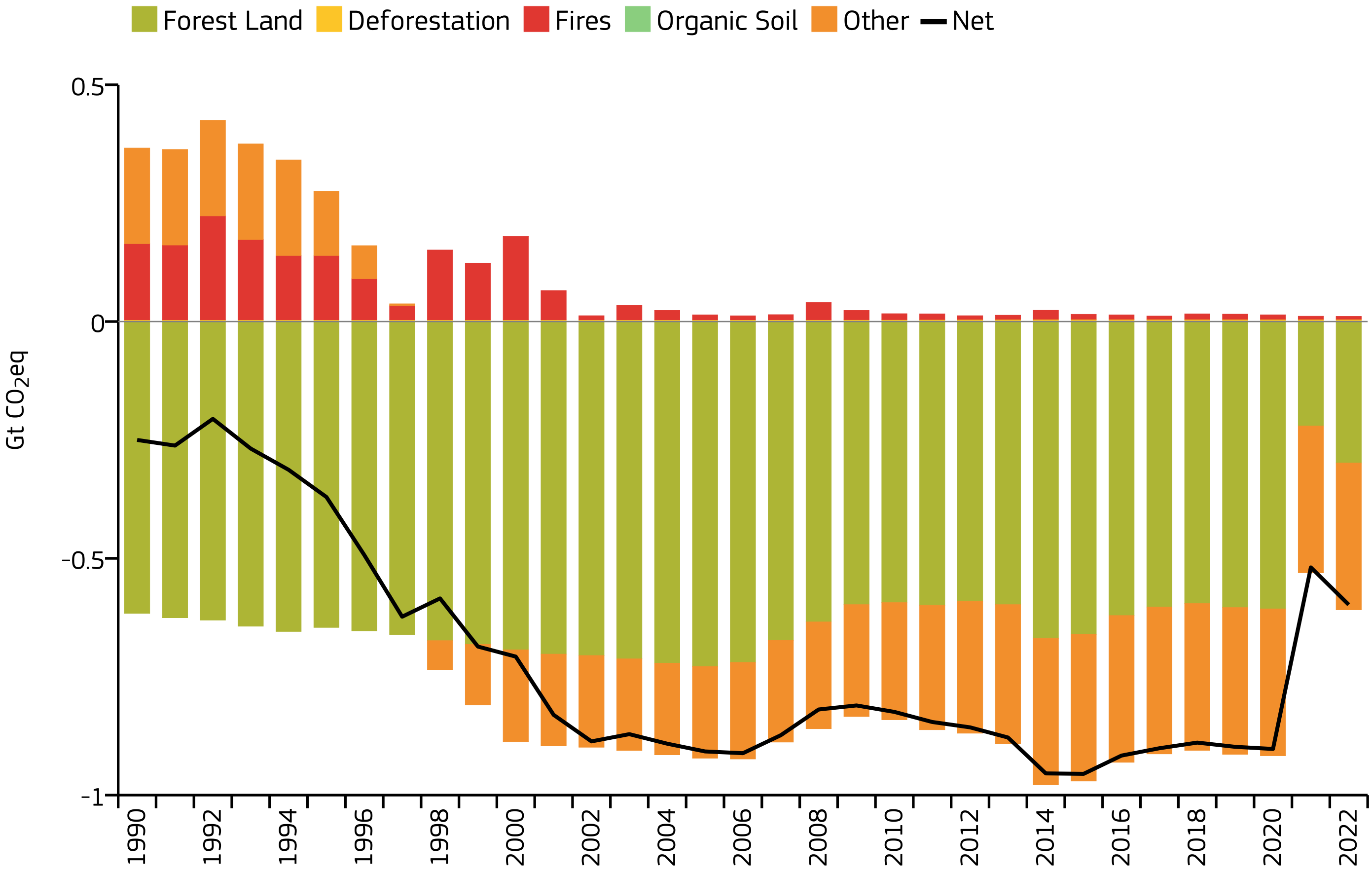


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	0.066	0.361	0.106	-0.139

Countries included in Asia-Pacific Developed:
Australia; Japan; New Zealand.

Eastern Asia

GHG emissions and removals from LULUCF sector

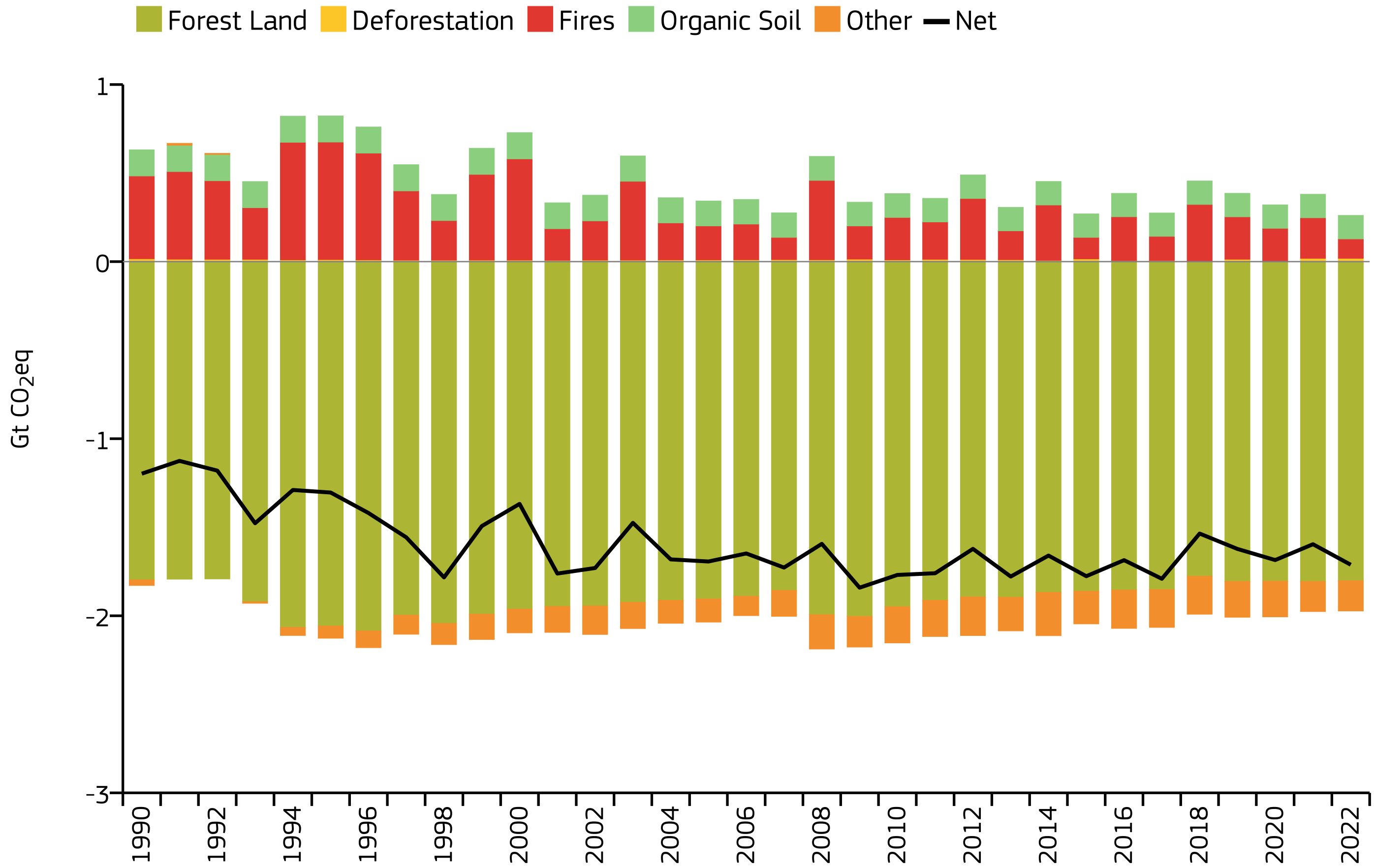


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	-0.250	-0.707	-0.955	-0.598

Countries included in Eastern Asia:
China; Hong Kong; Macao; Mongolia; North Korea; South Korea; Taiwan.

Eurasia

GHG emissions and removals from LULUCF sector

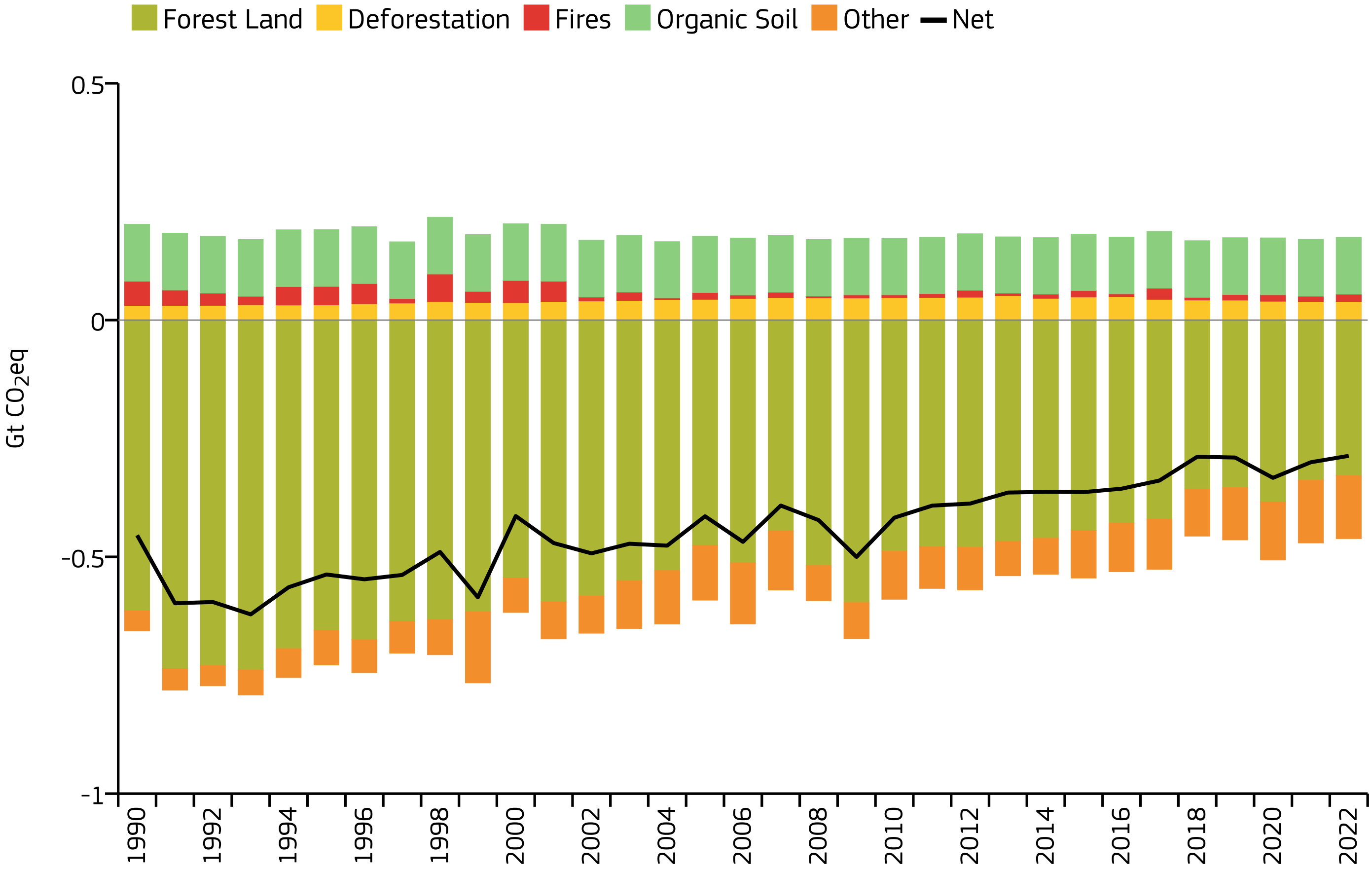


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	-1.198	-1.368	-1.776	-1.712

Countries included in Eurasia:
Armenia; Azerbaijan; Belarus; Georgia; Kazakhstan; Kyrgyzstan; Moldova; North Macedonia; Russia; Serbia and Montenegro; Tajikistan; Turkmenistan; Uzbekistan.

Europe

GHG emissions and removals from LULUCF sector

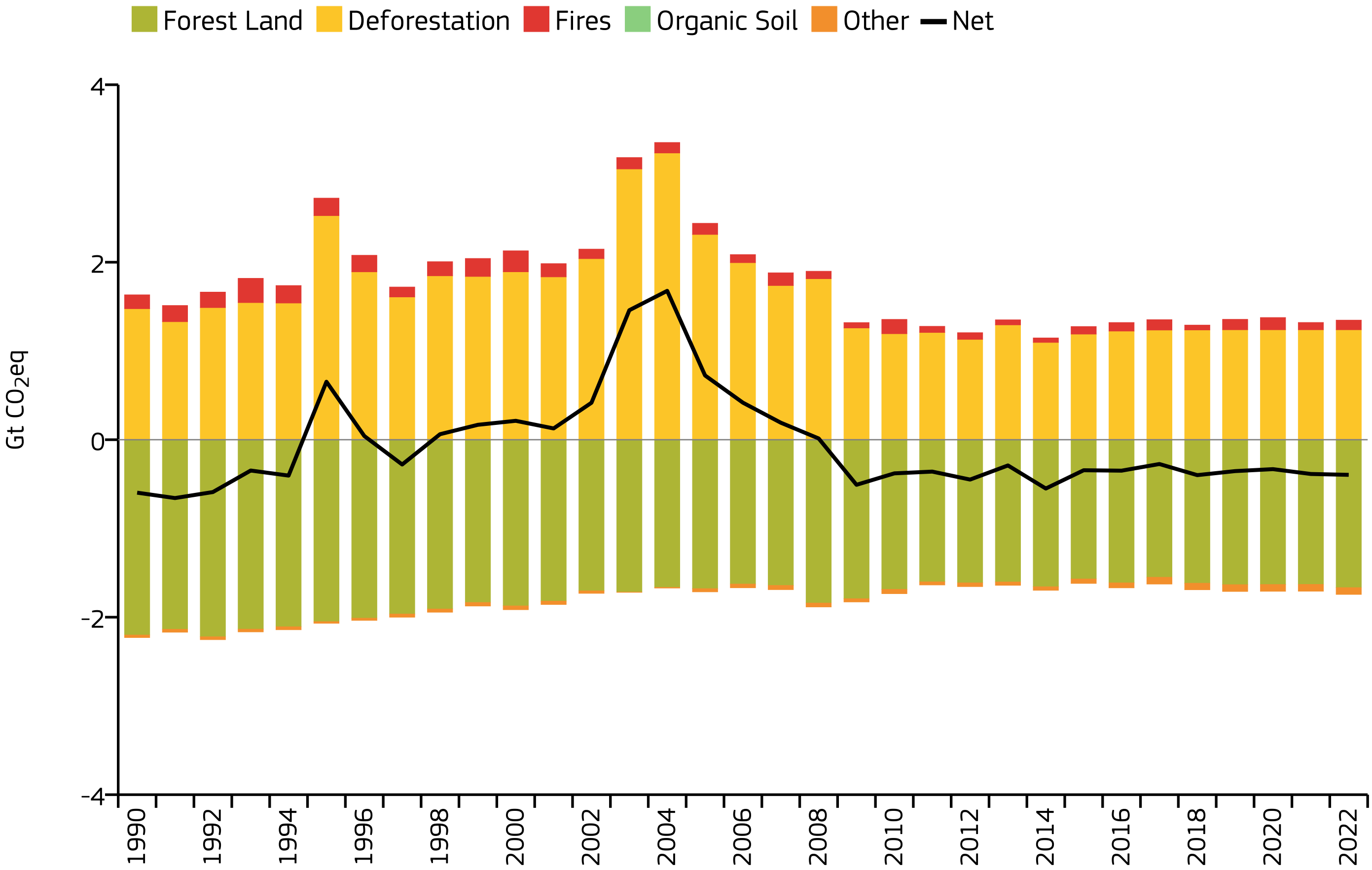


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	-0.454	-0.414	-0.363	-0.287

Countries included in Europe:
Albania; Austria; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; Cyprus; Czechia; Denmark; Estonia; Faroes; Finland; France and Monaco; Germany; Gibraltar; Greece; Hungary; Iceland; Ireland; Italy, San Marino and the Holy See; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Norway; Poland; Portugal; Romania; Slovakia; Slovenia; Spain and Andorra; Sweden; Switzerland and Liechtenstein; Türkiye; Ukraine; United Kingdom.

Latin America and Caribbean

GHG emissions and removals from LULUCF sector

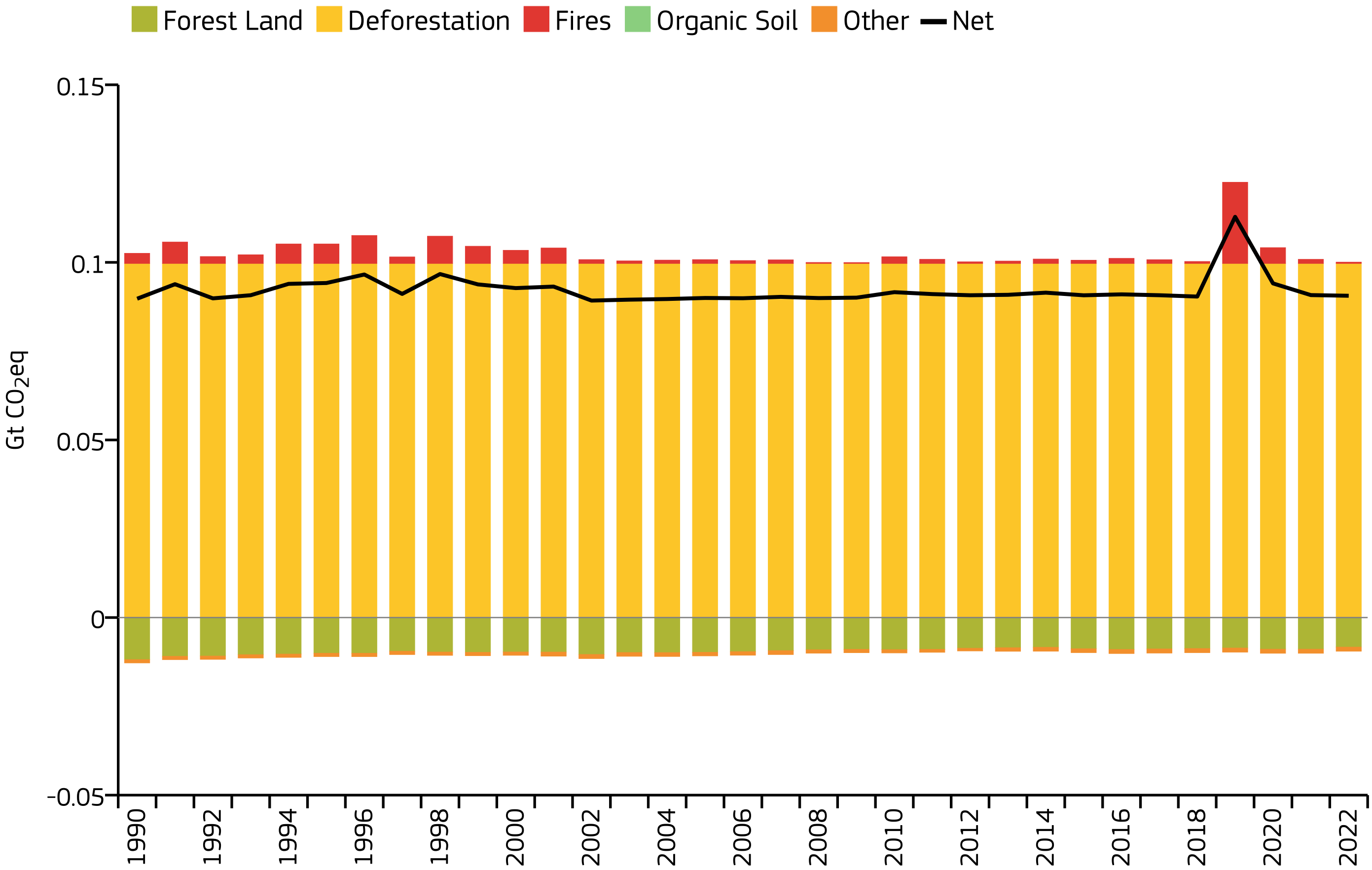


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	-0.597	0.213	-0.344	-0.396

Countries included in Latin America and Caribbean:
Anguilla; Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia; Brazil; British Virgin Islands; Cayman Islands; Chile; Colombia; Costa Rica; Cuba; Curaçao; Dominica; Dominican Republic; Ecuador; El Salvador; Falkland Islands; French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Turks and Caicos Islands; Uruguay; Venezuela.

Middle East

GHG emissions and removals from LULUCF sector

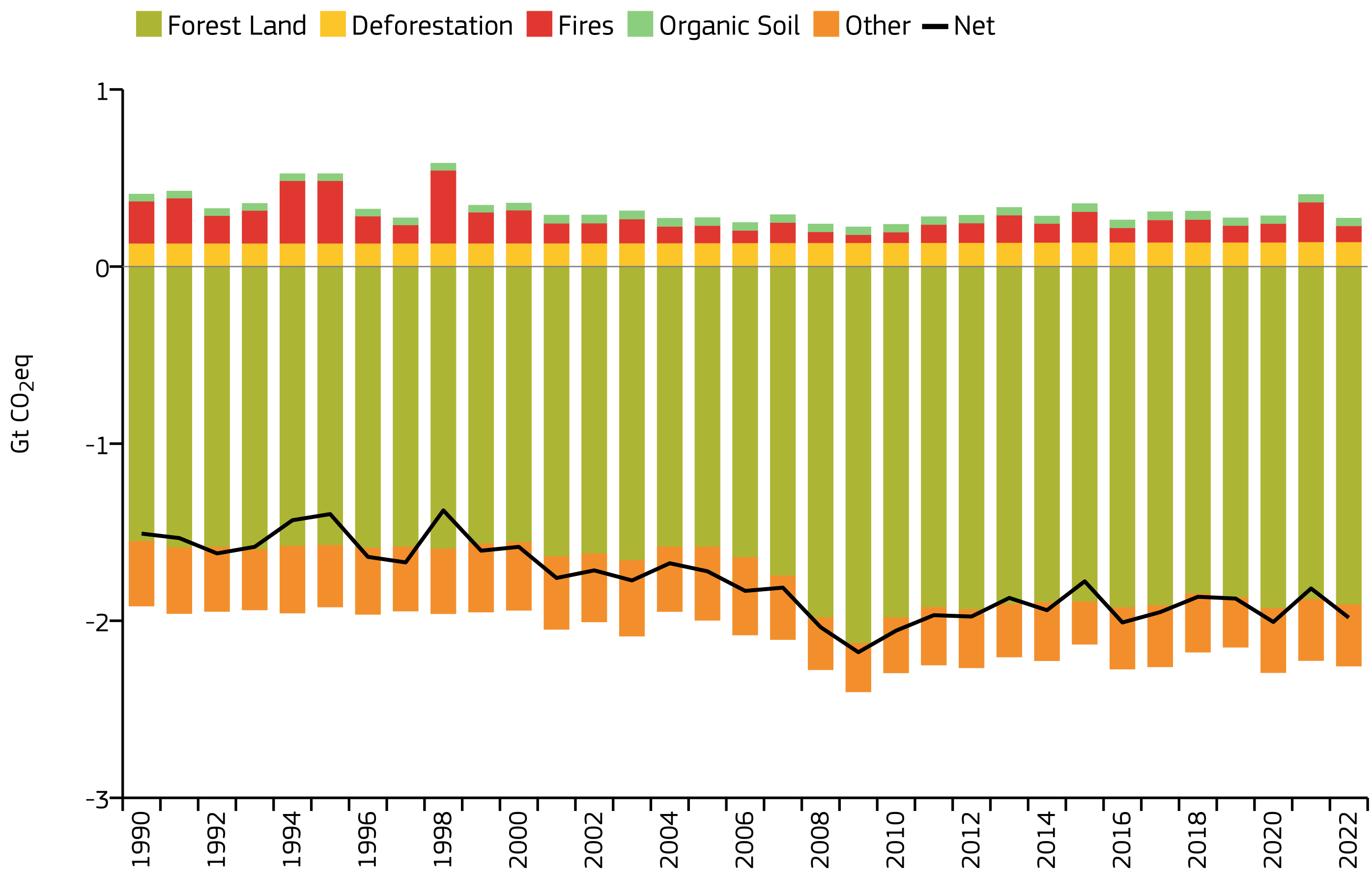


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	0.090	0.093	0.091	0.091

Countries included in Middle East:
Bahrain; Iran; Iraq; Israel and Palestine, State of; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; Syria; United Arab Emirates; Yemen.

North America

GHG emissions and removals from LULUCF sector

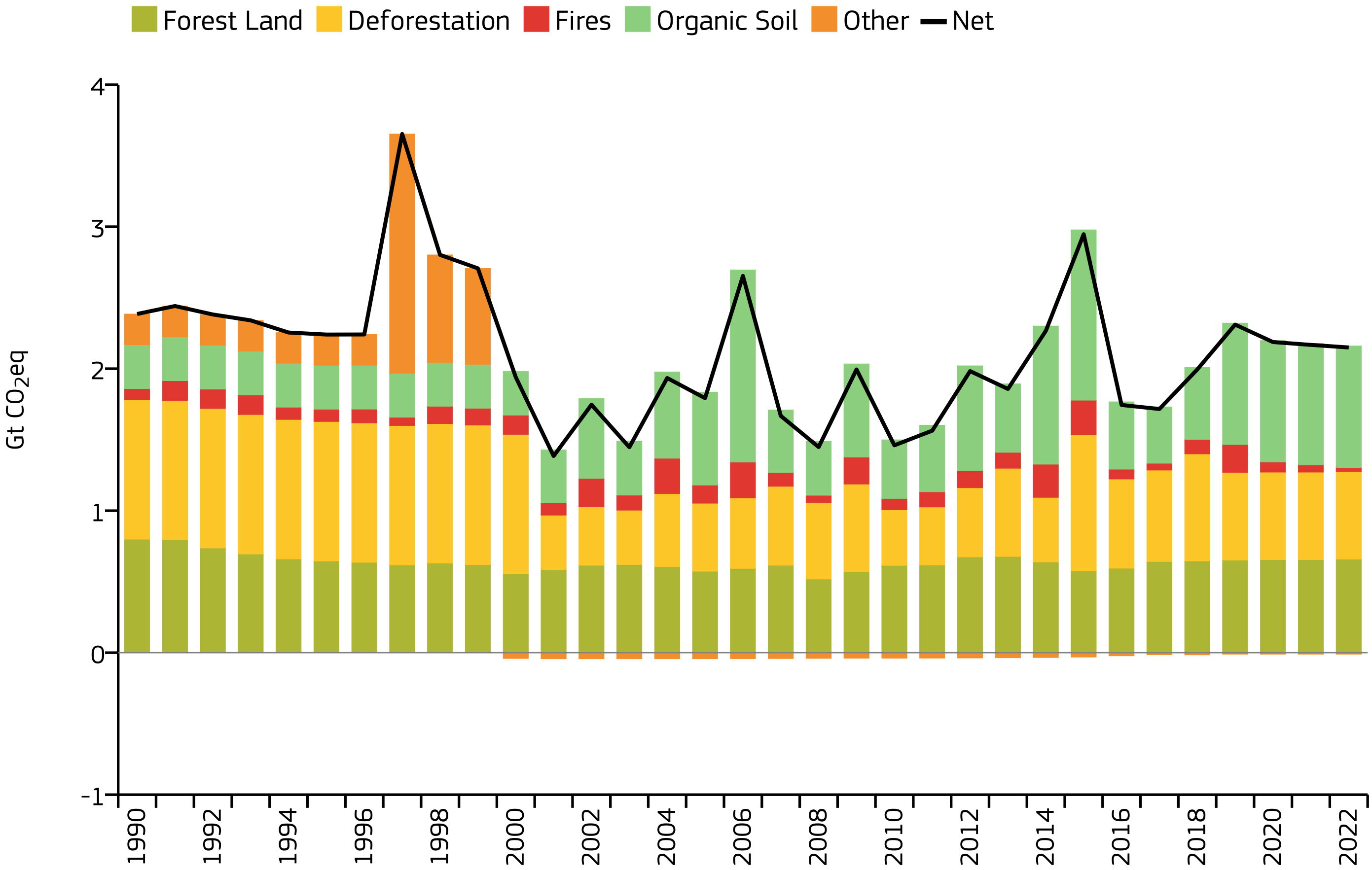


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	-1.508	-1.583	-1.777	-1.982

Countries included in North America:
Bermuda; Canada; Greenland; Saint Pierre and Miquelon; United States.

South-East Asia and developing Pacific

GHG emissions and removals from LULUCF sector

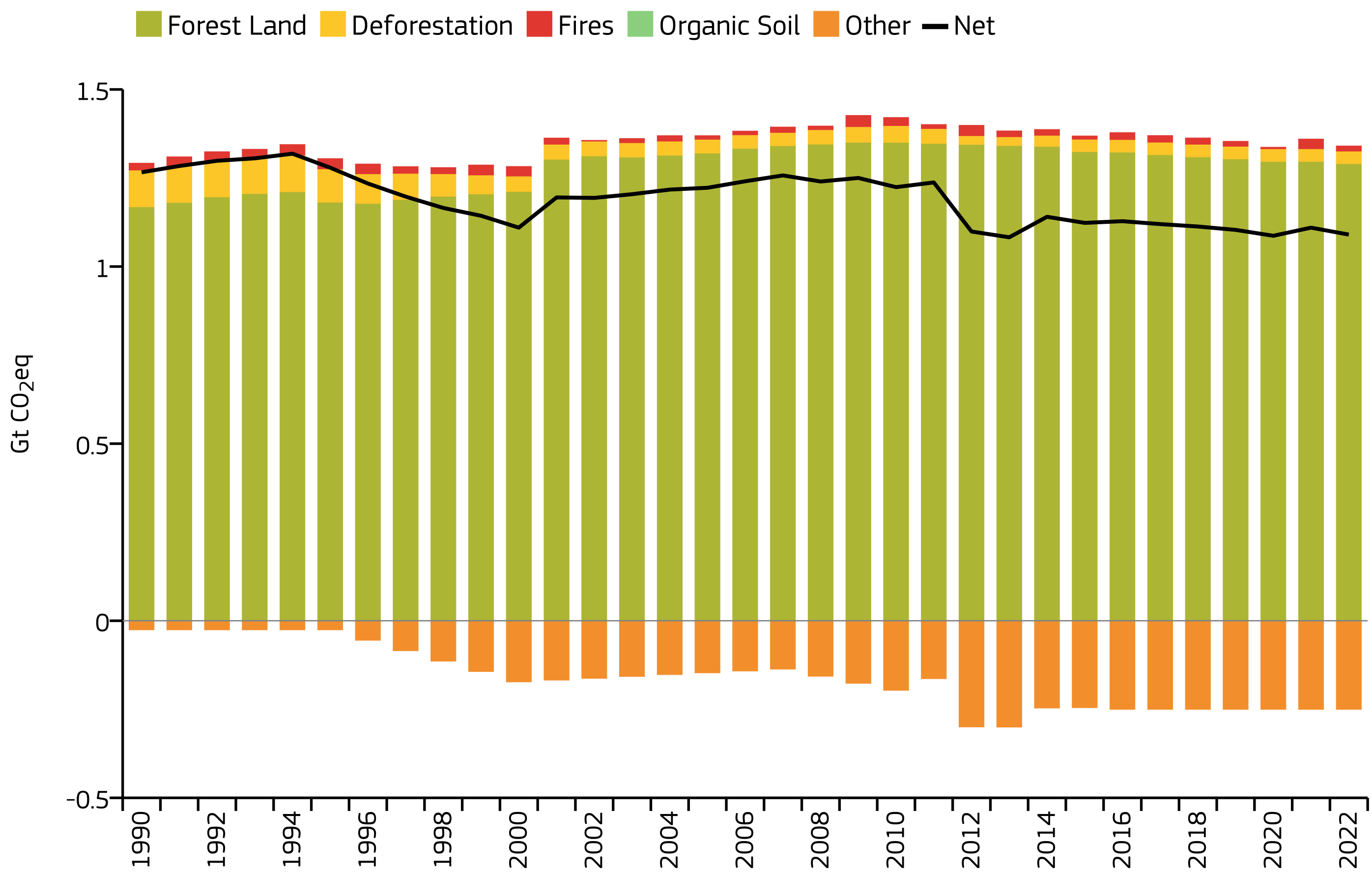


Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	2.385	1.941	2.947	2.150

Countries included in South-East Asia and developing Pacific:
Brunei; Cambodia; Cook Islands; Fiji; French Polynesia; Indonesia; Kiribati; Laos; Malaysia; Myanmar/Burma; New Caledonia; Palau; Papua New Guinea; Philippines; Samoa; Singapore; Solomon Islands; Thailand; Timor-Leste; Tonga; Vanuatu; Vietnam.

Southern Asia

GHG emissions and removals from LULUCF sector



Year	1990	2000	2015	2022
Net flux (Gt CO_2eq /yr)	1.266	1.110	1.123	1.090

Countries included in Southern Asia:
Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka.

Disclaimer

This publication presents GHG emissions from all countries, while GHG emissions from LULUCF are presented for EU27 and by macro-regions without any prejudice to the status or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory. Country names are consistent with the Interinstitutional Style Guide of the European Commission available at http://publications.europa.eu/code/en/en-370100.htm, the “Short name” definition listed in the "List of countries, territories and currencies" table at http://publications.europa.eu/code/en/en-5000500.htm has been used (updated on 04/07/2023).

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