The Basque Country Greenhouse Gas Inventory

2019 | EXECUTIVE SUMMARY

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DESIGN AND LAYOUT
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METHODOLOGY

The Basque Greenhouse Gas Inventory is statistical operation number 090205 in accordance with Law 8/2019, of 27 June, of the Basque Statistics Plan 2019-2022. The methodology is consistent with that established in the United Nations Framework Convention on Climate Change (UNFCCC) inventory reporting guidelines[1], its Common Reporting Format (CRF) tables, and the methodological guidelines for estimates and compilation of inventories of the Intergovernmental Panel on Climate Change[2] (IPCC Guidelines 2006).

Within the process of continuous improvement, an inventory verification process has been performed to ensure quality control equivalent to that of national inventories reported to the UNFCCC. Several aspects of the inventory have been verified by an external team of experts (general criteria, energy, industrial processes, forestry and other land uses, agriculture, and waste) following the inventory reporting guidelines of the United Nations Framework Convention on Climate Change.

The review took place in November 2019, and concluded that the Basque Country inventory "*estimates greenhouse gas emissions and sequestrations with generally appropriate methods and a high degree of completeness*".

The team also *"appreciated the fact that, although the autonomous communities are not bound by national regulations or international conventions when preparing and reporting these inventories, the government of the Basque Country has regularly compiled its inventory and made this public since 2000"*. Following the review, a number of improvements were proposed, many of them procedural, mainly relating to documentation, traceability, justification for completeness of some categories and quality control/ quality management. A large number of these enhancements have already been implemented in the previous version of the Inventory, while the remainder have been implemented in this edition.

CLIMATE CHANGE IN THE BASQUE COUNTRY

As the United Nations has reiterated on numerous occasions, climate change is a major environmental challenge of the 21st century. According to the IPCC's 5th Assessment Report (AR5; 2014), the average temperature of the planet has increased by 0.85ºC in the last century and may increase by a range of 3.7ºC to 4.8ºC by the end of the twenty-first century. According to the IPCC *"Special Report 1.5, 2019"* the temperature has already increased by 1ºC (0.8-1.2).

1 The Article 8 revision guidelines (adopted by decision 22 / CMP.1 and revised by decision 4 / CMP.11), the UNFCCC revision guidelines, particularly Part III thereof, namely, *"UNFCCC Guidelines for the Technical Assessment of Greenhouse Gas Inventories of Parties included in Annex I to the Convention"* (decision 13/CP.20). https://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf

2 The methodological guidelines are mandatory for Annex I countries, which therefore apply to the Basque Country, are the *"2006 IPCC Guidelines for National Greenhouse Gas Inventories"*. https://www.ipcc-nggip.iges.or.jp/public/2006gl/spanish/index.html

After the Kyoto Protocol, which regulates greenhouse gas (GHG) emissions for the signatory countries, between 2008-2012, the Paris Agreement, signed by 175 parties, i.e. 174 countries and the European Union, it is decided *"to keep **the global average temperature rise well below 2ºC** compared to pre-industrial levels, and to continue efforts to limit this temperature rise to 1.5ºC from pre-industrial levels"*.

The European Union is committed to reducing greenhouse gas emissions by 20% compared with 1990 levels and 55% by 2030 in accordance with the "*Climate and Energy Package by 2020"* and the EU's updated contribution to the Paris Agreement, raising the target from the previous 40% set by the *"climate and energy framework for 2030"*. In the long term, both the *"Long-term Strategy for 2050"* and the so-called European Green Deal, as well as the European Climate Bill establish the need to achieve **climate neutrality** by 2050, or sooner if possible, by reducing emissions to such an extent that **they are offset by sequestration**. It also sets an intermediate target to reduce emissions by 55% in 2030 compared to 1990, and several other aspects:

- Recognition of the need to improve the EU's carbon sequestration through a more ambitious LULUCF regulation.
- A process to set a climate target by 2040.
- A commitment to negative emissions after 2050.
- The establishment of the European Scientific Advisory Board on Climate Change to provide independent scientific advice.
- Stricter provisions on adaptation to climate change.
- The commitment to work with the sectors to prepare sector-specific roadmaps to achieve climate neutrality in different areas of the economy.

However, as was the case with the Kyoto Protocol, the different conditions of income and per capita emissions in 1990 hinder the direct translation of these European reduction targets from 1990 to the individual countries.

On this occasion, following the launch of emissions trading, the EU chooses to set binding targets for non-ETS emissions with respect to 2005.

Emissions reduction is therefore divided into two major blocks:

- **Sectors regulated** by the EU Emissions Trading System (EU ETS). They are generally large, emission-intensive industrial or energy installations. Their emissions are regulated by the EU through the allocation of emission allowances. The reduction of rights and, therefore, emissions will be **21% until 2020** and **43% until 2030**, **compared with 2005**.
- **Non-ETC sectors**, (housing, agriculture, waste, transport, etc.) with binding state emission reduction targets, the average EU reduction target being **10% in 2020** and 3**0% in 2030 compared to 2005**.

The 2030 targets will need to be updated with the new 55% reduction commitment mentioned above.

In the B**asque Country, the Basque Climate Change Strategy - Klima 2050** - approved in 2015, sets as targets the reduction of GHG emissions by at least **40% by 2030** and by at least **80% by 2050** as compared to 2005 and to ensure the resilience of the Basque territory to climate change. There are other objectives, namely, to achieve a renewable energy consumption of 40% over final consumption by 2050.

On 30 July 2019, the entire Basque Government presented the *"Climate Emergency Declaration"* with the objective of making this a key regional priority.

Following an initial planning cycle (2015-2020), the process of revising the Klima 2050 strategy has begun, in a context in which Europe is making more ambitious climate commitments.

RESULTS

Emissions and sequestration in 2019

In 1990, the Basque Country emitted 20.8 million tons of CO_2-equivalent, 25.5 million tons in 2005 and 18.6 million tons in 2019. Compared to 2005, emissions have decreased by 27 and 11% compared to 1990.

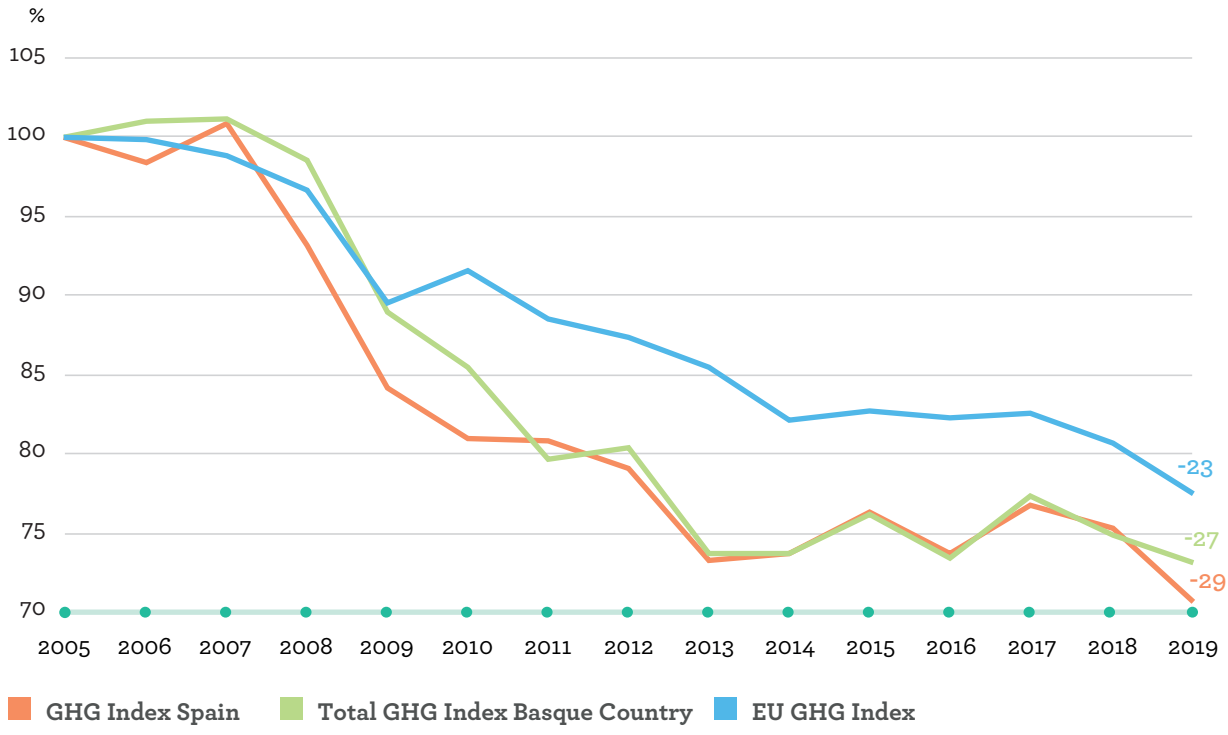
GHG emissions, measured in terms of CO_2-equivalent, have been reduced by 2% in 2019 compared to 2018, to 18.6 million tons in absolute terms. Last year's emissions were conditioned by a widespread decline in emissions in practically all sectors, with the exception of a minor increase in the agricultural sector. In the Land Use, Land Use Change and Forestry (LULUCF) sector, t1.7 million tons were sequestered in 2019.

Trends in GHG emissions and sequestration

Since 2005[3], emissions have decreased by 27% and by 11% compared to 1990. It can therefore be confirmed that GHG emissions reductions are being achieved more quickly than the targets set in the **Euskadi Klima 2050 Strategy**.

Figure 1.

Greenhouse gas emission trends in the Basque Country, the European Union-28 and Spain (2019) (year 2005 = 100)[4]



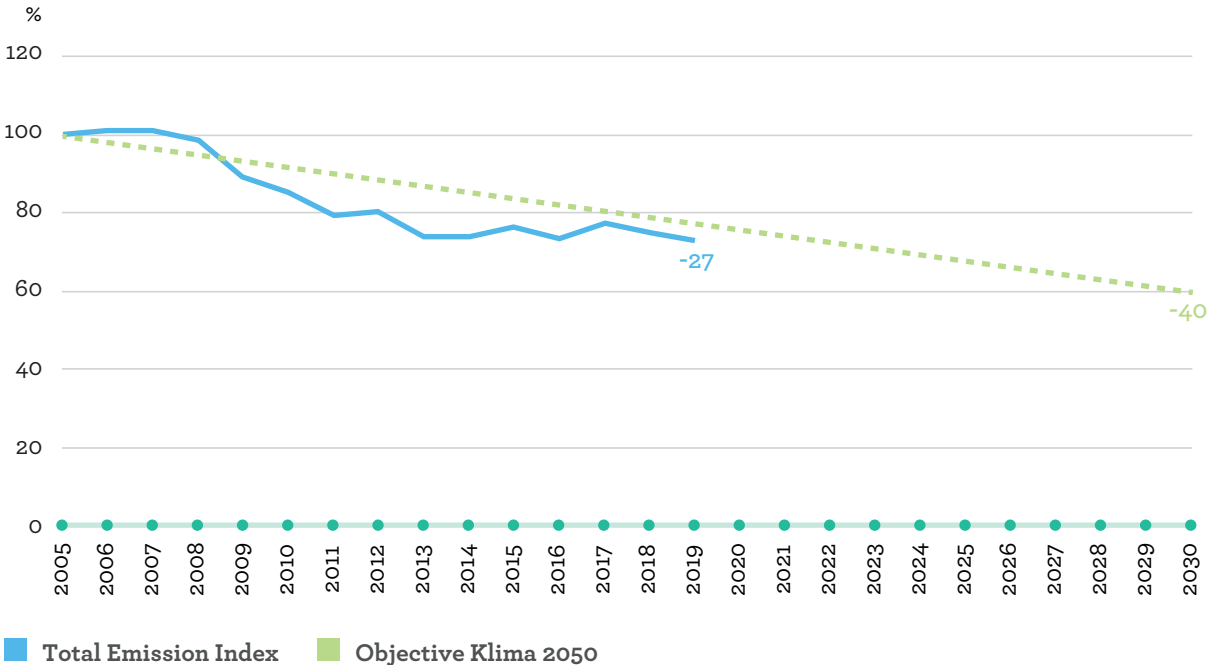
Source: Prepared in-house using data from Eurostat:
All sectors and indirect CO_2 (excluding LULUCF and memo items, including international aviation).
EA: Approximated estimates for greenhouse gas emissions (2019).

3 Baseline year of both the Klima 2050 strategy and the European countries as part of the decision to share non-ETS emissions efforts 406/2009/EC.

4 Emissions in Spain in 2018, obtained from data published in https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/sistema-espanol-de-inventario-sei-/Inventario-GEI.aspx. For Europe, obtained from EEA Report No 16/2019. *"Annual European Union approximated greenhouse gas inventory for the year 2018"*.

Figure 2.

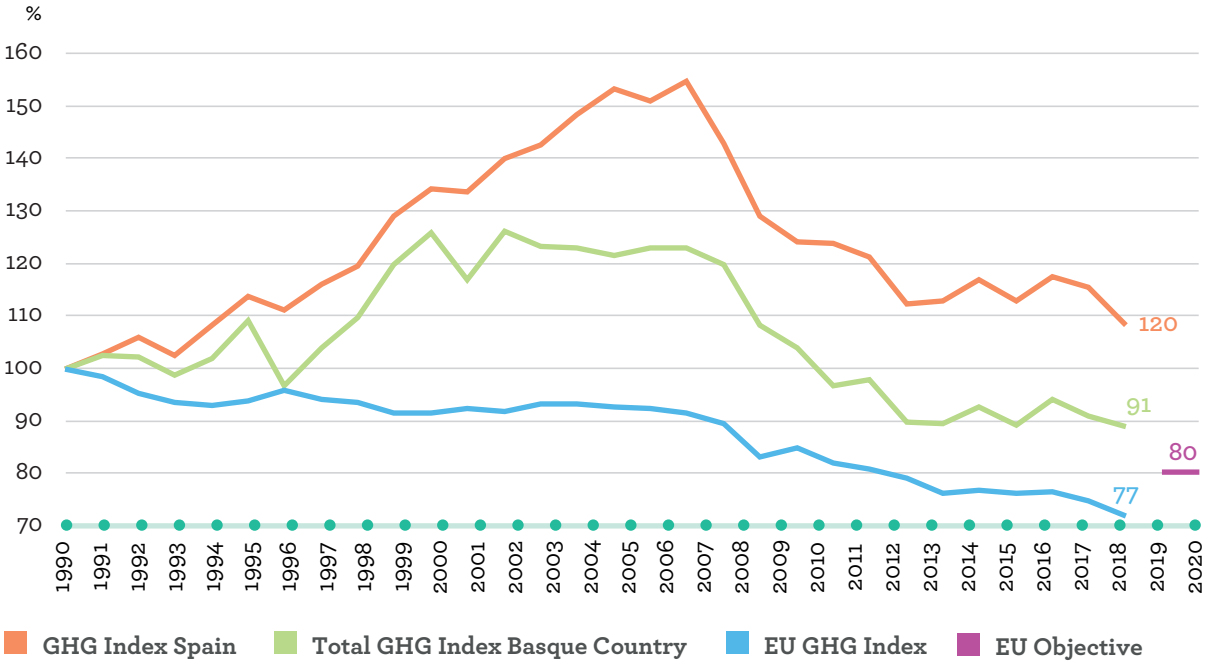
Emissions trends in relation to the objective of the Climate Change Strategy for 2050



Source: Prepared in-house.

Figure 3.

Greenhouse gas emissions trends in the Basque Country, the European Union-28 and in Spain (2019) (1990 = 100)



Source: Prepared in-house using data from:
Eurostat: All sectors and indirect CO_2 (excluding LULUCF and memo items, including international aviation).
EEA: Approximated estimates for greenhouse gas emissions (2019).

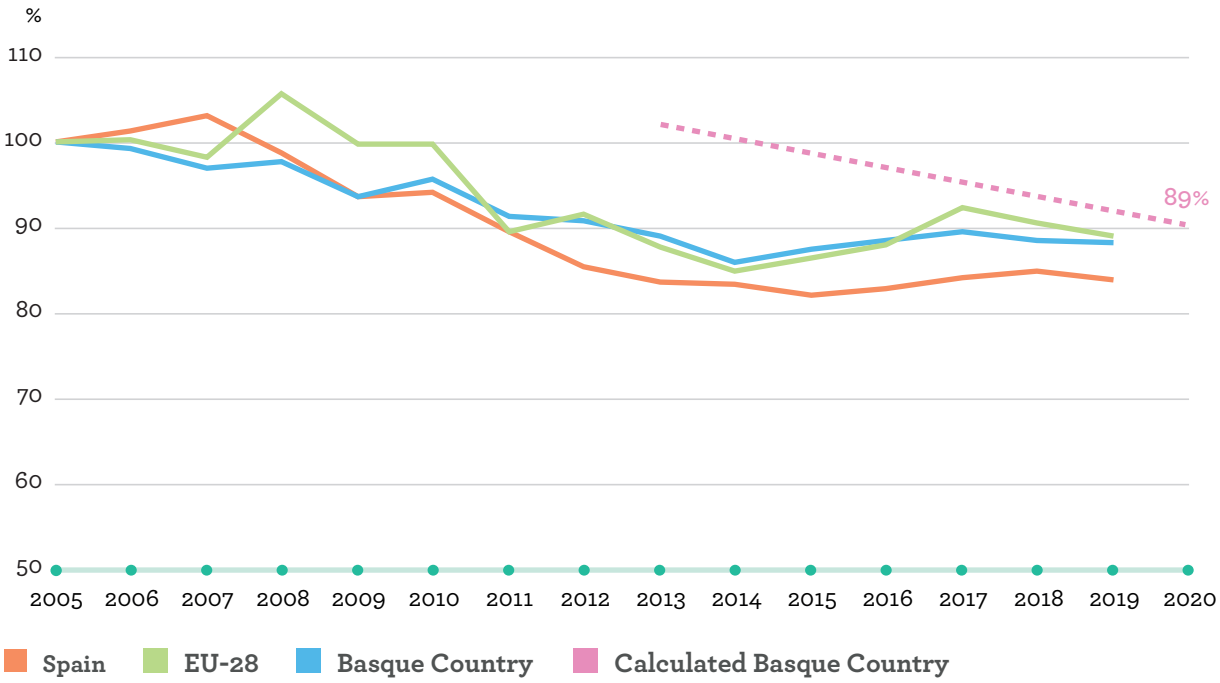
Non-ETS emissions

Las emisiones difusas en la Comunidad Non-ETS emissions in the Autonomous Community of the Basque Country **have fallen by 11%** since 2005, **so the Basque Country has already met the average binding target set at 2020 for the Member states (10%)**.

All greenhouse gas emissions that are not from companies in the ETS are called non-ETS emissions. Non-ETS emissions include greenhouse gas emissions from agriculture, waste, homes, services, transport, and non-regulated industry. Based on these emissions, the European Union sets the binding targets for each of the countries, in accordance with the Effort Sharing Decision.

Figure 4.

Non-ETS emission trends in the Basque Country, the EU (28) and Spain (2005 = 100)



Source: Prepared in-house using data from:
Non-ETS emissions (Eurostat).
Emission Rights Trading of companies in the Basque Country.

Emissions from regulated sectors, i.e. those governed by the EU Emissions Trading System (EU ETS) (mainly the energy sector and energy-intensive industrial sectors) have increased considerably in the last year mainly due to higher emissions from combined cycle power production. Emissions from regulated industry have decreased in all sectors (other than combustion plants), highlighting the decline in the refining and cement sector.

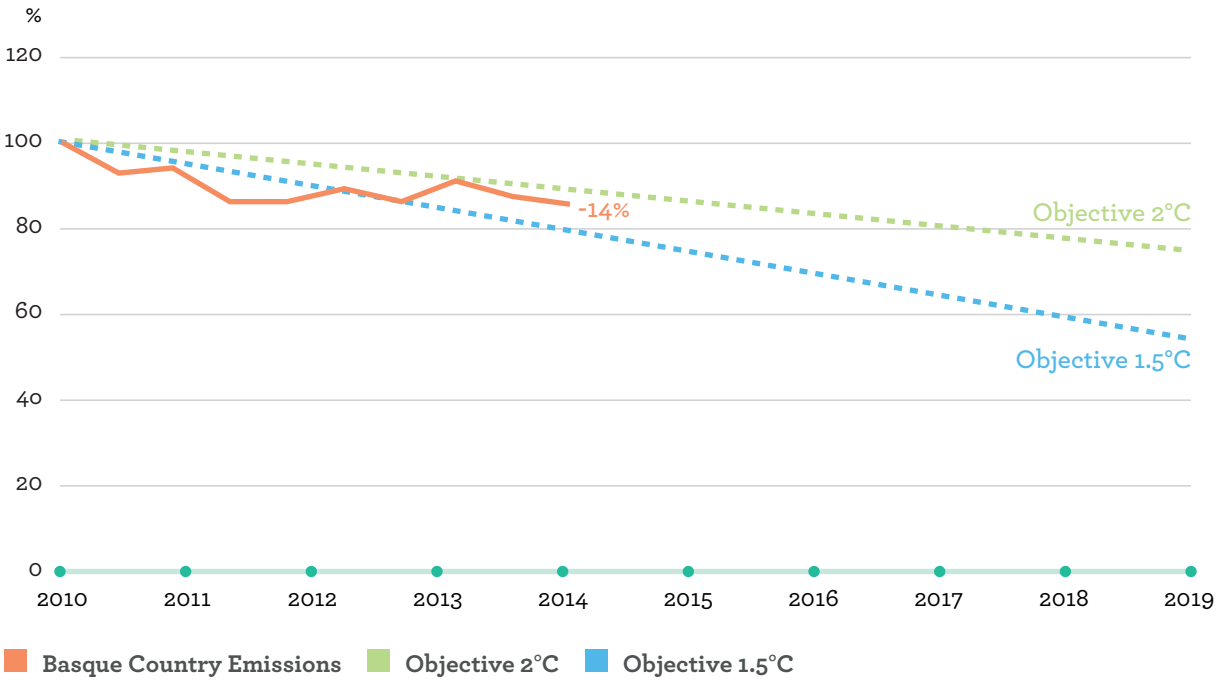
Compared to 2005, the first year of this scheme, emissions **have decreased by 38%**.

Compared to the year 2010, the baseline year of the IPCC special report **"1.5º C global warming"** published in 2019, emissions in the Basque Country have been reduced by 14%, so we set to achieve the **containment of global warming by 2ºC** (-25% in 2030), **but not the 1.5ºC target** (-45% in 2030).

In the LULUCF sector there has been a general **net CO_2 sequestering** in all the years studied, with an average of **2.1 million tons of CO_2-eq/year fixed**, ranging from 1.2 to 2.9 million tons of CO_2-eq/year. A total of 1.7 million tons were sequestered in 2019.

Figure 5.

Emissions trends vs IPCC 1.5°C report objectives (2010 = 100)



Source: Prepared in-house.

Emission indicators

Energy intensity, or the amount of energy consumed per unit of GDP, has fallen by 39% since 2005 and 54% since 1990, **indicating the economic-emission decoupling** of the Basque economy.

Our emissions intensity is also below the European average in terms of purchasing parity.

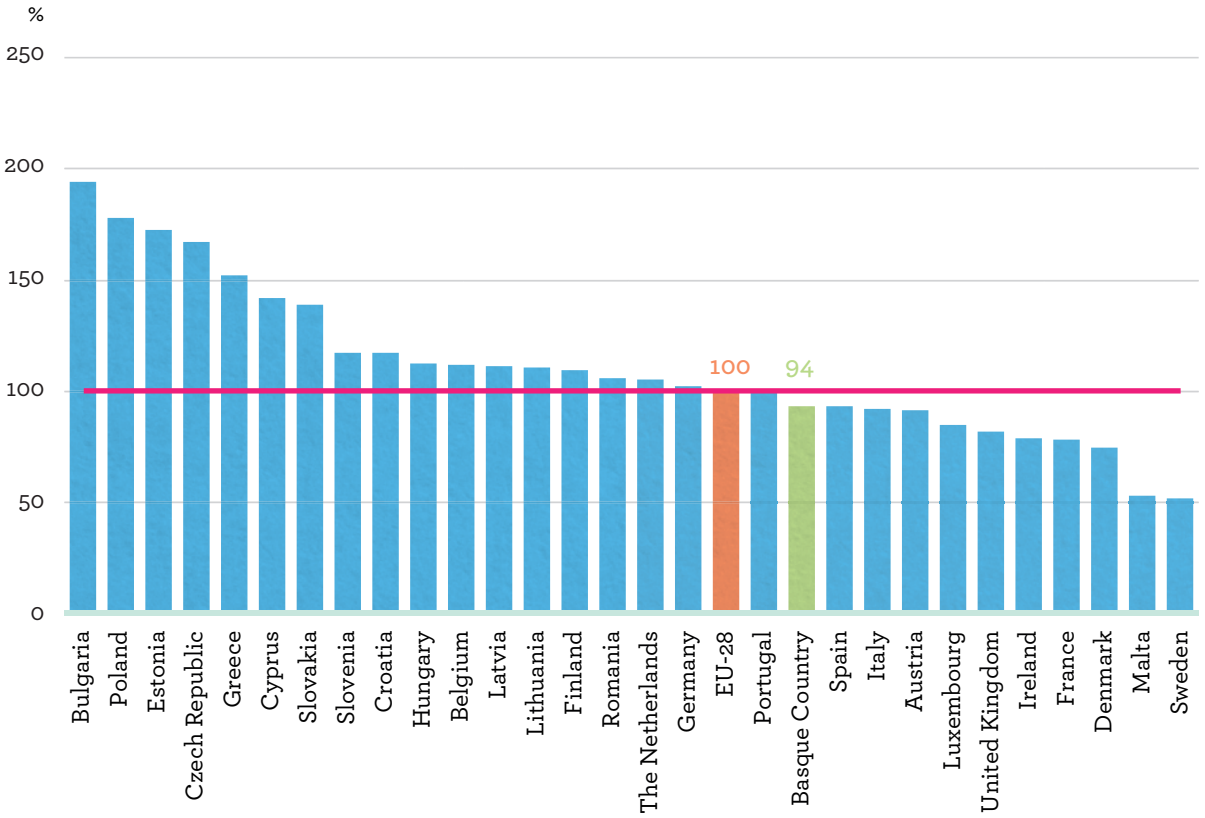
Figure 6.

Trends in total GHG emissions in relation to the GDP of the Basque Country since 2005

Source: Prepared in-house using data from: Basque Statistical Institute (Eustat).

Figure 7.

CO_2 per GDP-PPP[5] (in purchasing power parity) of the Basque Country and the EU-28 countries (2019) (UE-28 = 100)[6]



Source: Prepared in-house using data from:
Eurostat: All sectors and indirect CO_2 (excluding LULUCF and memo items, including international aviation).
Basque Statistical Institute (Eustat).
Statistical Office of the European Union (Eurostat).

Per capita emissions have declined by 30% since 2005 and by 15% since 1990.

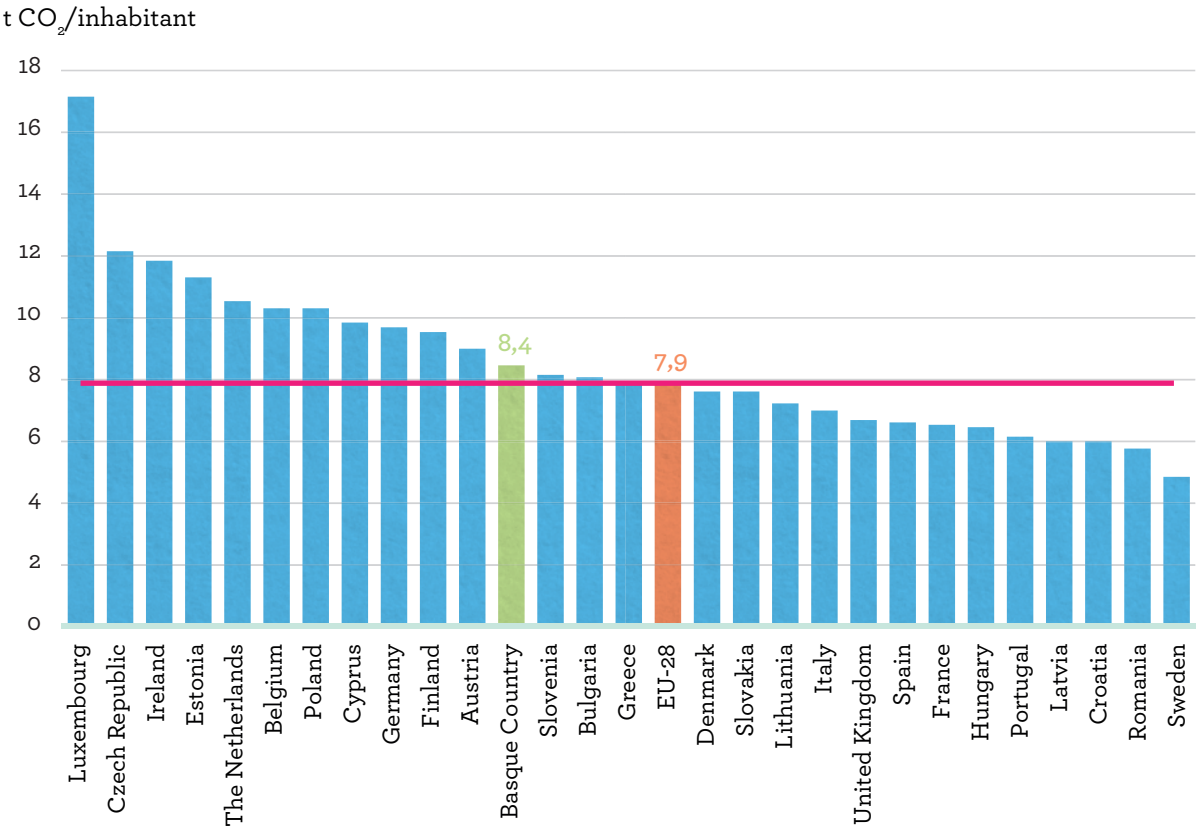
Despite this, **our per capita emissions remain slightly (6%) above the EU-28 average**. In the European Union, there are large differences in per capita emissions, which may be due to a wide range of factors: structure of the productive system, per capita income, type of energy consumed, average annual temperature, etc. It is thought that the industrial weight in the Basque Country, and the importance of GHG emissions intensive sectors could influence the *per-capita* emission rate.

5 GDP PPP: Gross domestic product expressed in purchasing power parity (PPP).

6 Emissions from the year 2019, obtained from the publication *"Approximated estimates for greenhouse gas emissions (2019)"* EEA Report.

Figure 8.

Emission rates of CO_2 per inhabitant[7] of the Basque Country and the EU-28 countries (2019)[8]



Source: Prepared in-house using data from:
Eurostat: All sectors and indirect CO_2 (excluding LULUCF and memo items, including international aviation).
EEA: Approximated estimates for greenhouse gas emissions (2019).
Basque Statistical Institute (Eustat).
Statistical Office of the European Union (Eurostat).

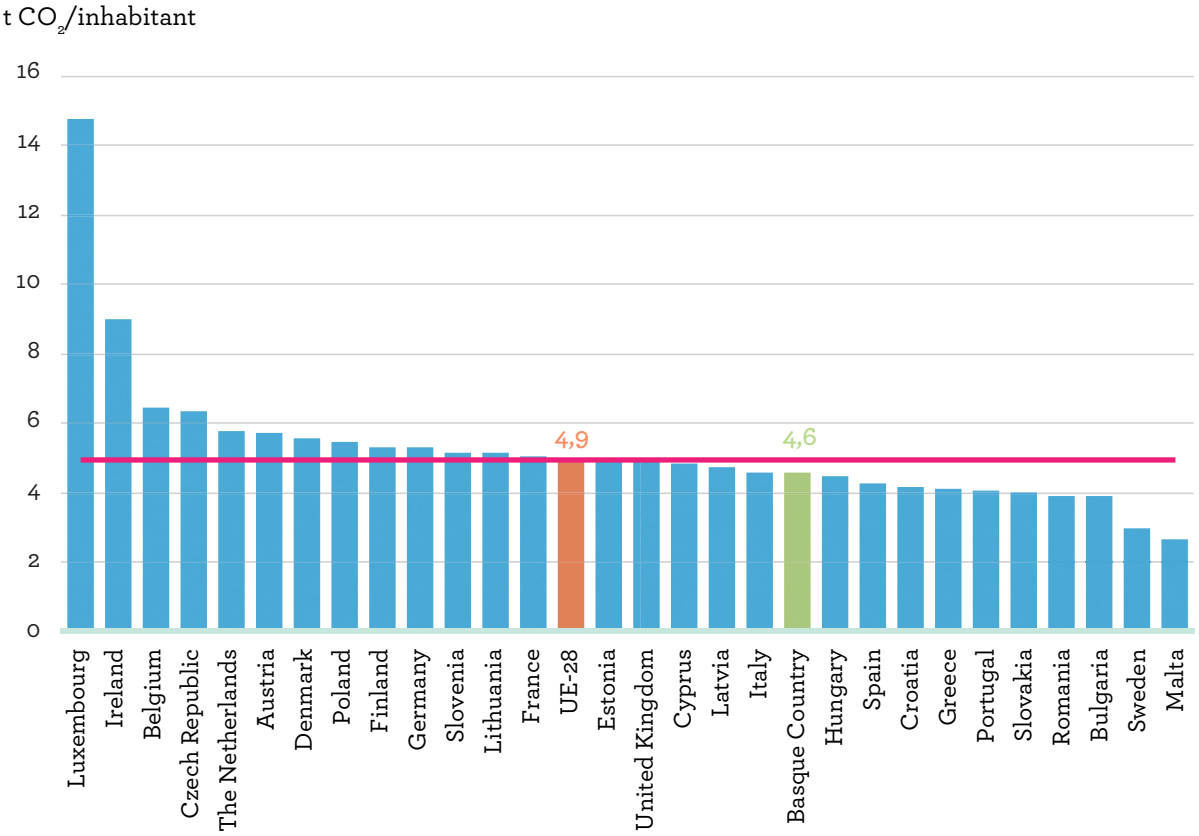
Eliminating the most emission-intensive sectors (EU-ETS), **our per capita non-ETS emissions are lower (8%) than the EU-28 average**.

7 Population data as of January 1 of the target year.

8 2019 emissions, obtained from the publication *"Approximated estimates for greenhouse gas emissions (2019)"* EEA Report .

Figure 9.

Non-ETS emissions ratio per inhabitant[9] in the Basque Country and in UE-28



Source: Prepared in-house using data from:
Basque Statistical Institute (Eustat).
Statistical Office of the European Union (Eurostat).

9 Population data as of January 1 of the year analysed.

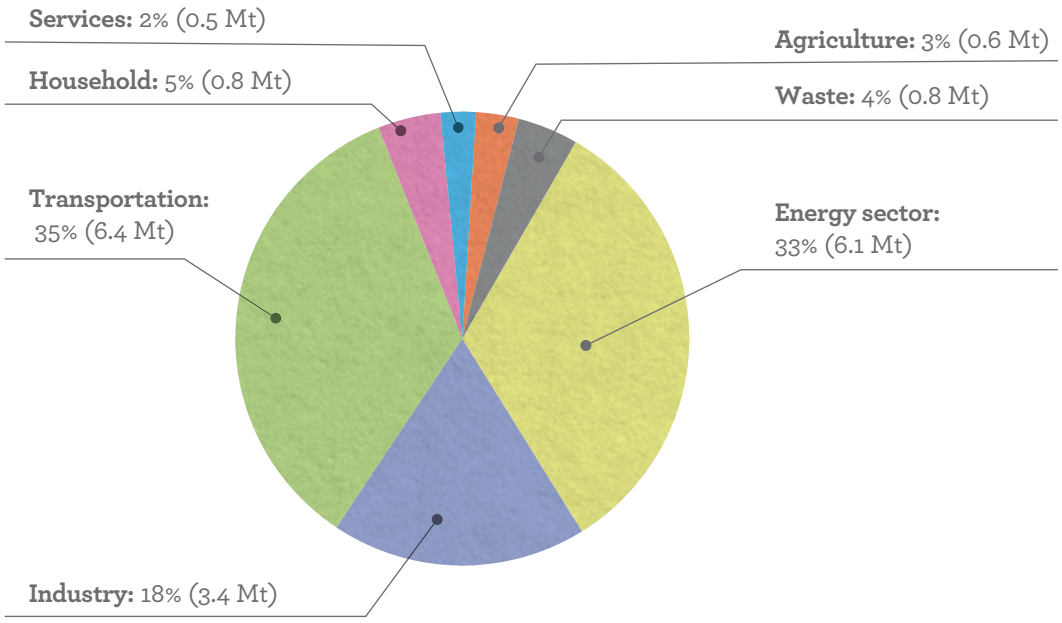
Emissions from socio-economic sectors

The sectors responsible for the majority of GHG emissions inventory are the energy, transport, and industrial sectors. These three sectors account for 86% of emissions.

However, given that emissions from the energy sector are due to supplying energy to the other sectors, this distribution has been analysed by incorporating the emissions due to their electricity consumption in each sector.

Figure 10.

GHG emissions by sector[10] in the Basque Country in 2019



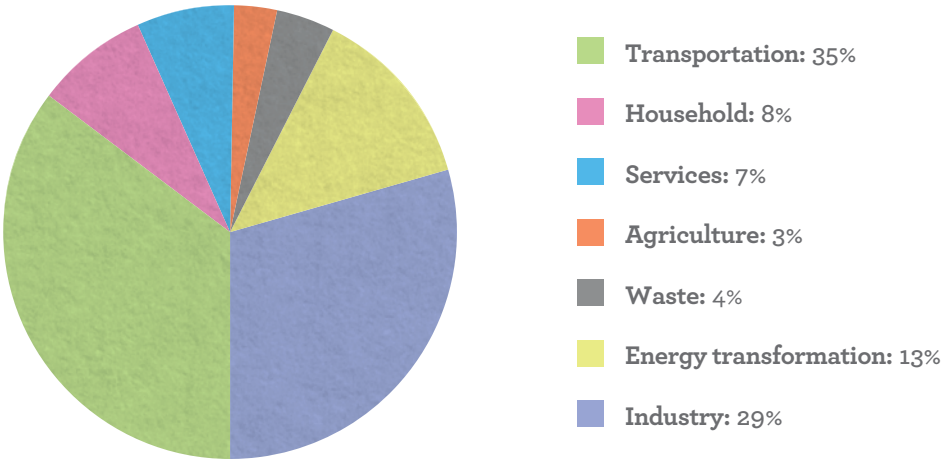
Source: Prepared in-house.

From this perspective, emissions from the industrial and transport sectors account for approximately 30% each (29% and 35% respectively), the energy processing sector (refining, internal consumption, losses...) for 13% and the sum of household and service sectors add up to 15%. The agricultural and waste sectors have lower emissions from both points of view.

10 The energy sector includes emissions from internal and external electrical production to meet domestic demand, refining, including internal power plant consumption and transport losses.

Figure 11.

GHG emissions by sector[11] in the Basque Country in 2019, allocating emissions derived from electricity consumption to each sector



Source: Prepared in-house.

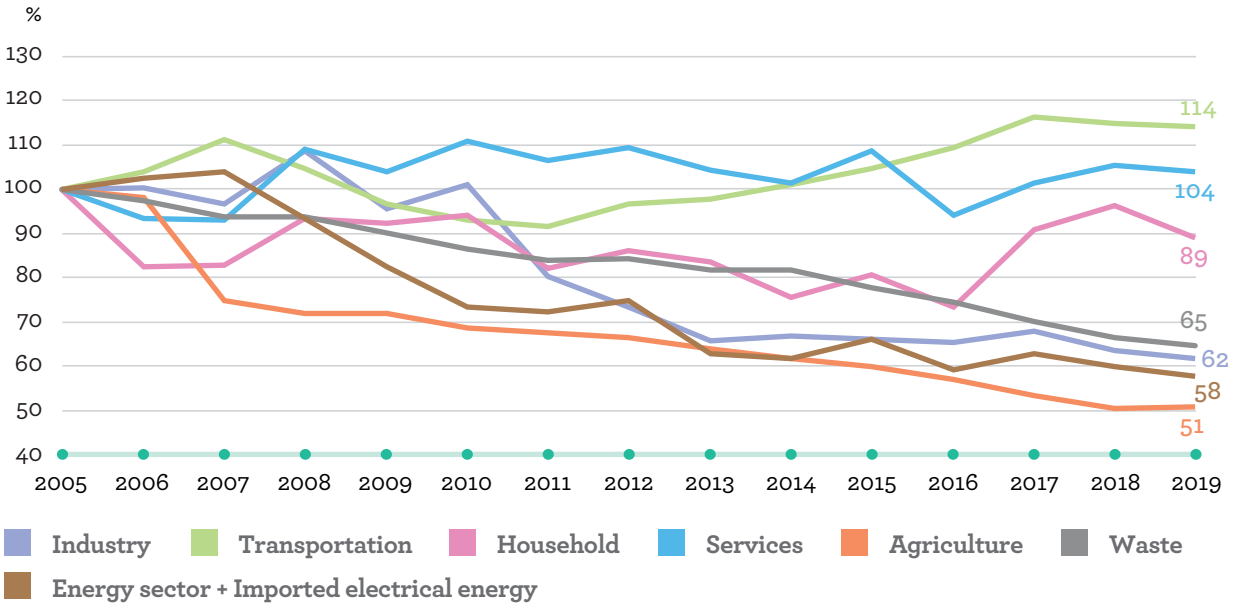
In terms of historical emissions trends, the sectors that have reduced them the most are industry (by 38% compared to 2005 and 52% compared to 1990) and energy (42% compared to 2005 and 22% compared to 1990). The agricultural and waste sectors have also decreased their emissions, however, as mentioned above their contribution is small. The household and service sectors have increased their emissions in percentage terms since 1990 (33% household and slightly more than triple the services sector), while since 2005 emissions from the household sector have decreased by 11% and the services sector has increased by 4%.

The sector that has increased its emissions most in both relative and absolute terms (more than 3 million tons) is the transport sector, doubling its emissions since 1990, implying an increase of more than 3 million tons. These increases have occurred in both the transport of goods and the transport of people. The trend since 2005 is remarkable as the transport sector and the services sector are the only sectors that have increased their emissions (14% transport and 4% service). Trends in the transport sector have been changing, as the decline in emissions from the 2008 crisis and the increase in the years 2011-2017 has apparently seen a change in trend and a slight decrease in the last two years.

11 The energy processing sector includes refining activities, as well as internal power plant consumption and transport losses.

Figure 12.

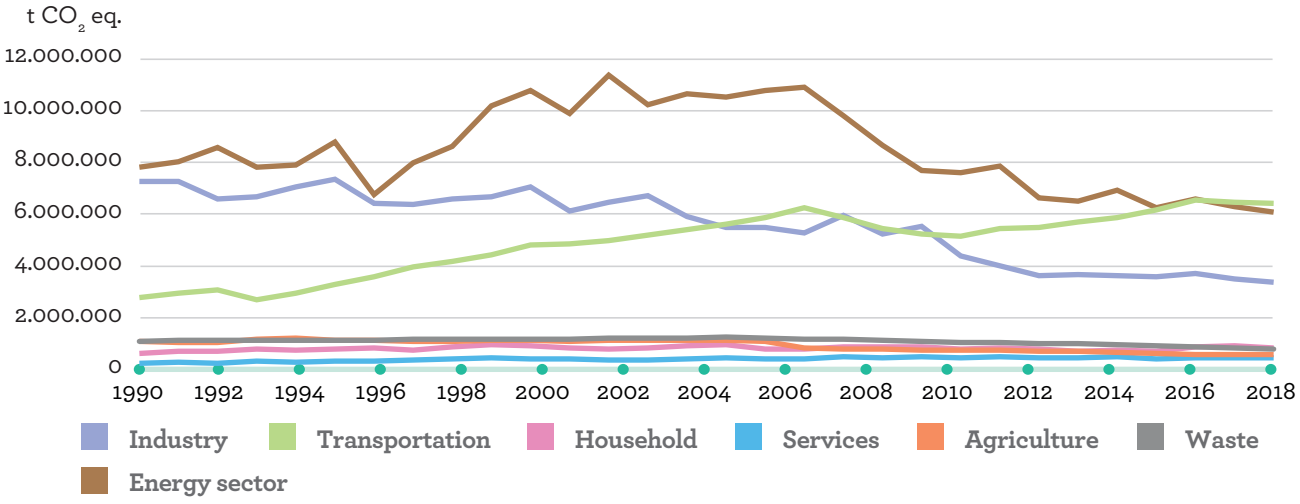
Emissions performance index by sector[12] (2005 = 100)



Source: Prepared in-house.

Figure 13.

Sectoral trends in[13] emissions in the Basque Country in absolute terms



Source: Prepared in-house.

The situation and trends in the main issuing sectors are summarised below[14].

12 The energy sector includes emissions from internal and external electrical production to meet domestic demand, coke, refining, including internal power plant consumption and transport losses.

13 The energy sector includes emissions from internal and external electrical production to meet domestic demand, coke, refining, including internal power plant consumption and transport losses.

14 This executive report only summarises the main findings of the main emitting sectors. It aims to provide a simple and understandable approach to the situation and trends in emissions. Hence the simplified analysis, which can be complemented with the data and the detailed information for all sectors provided in the body of this report.

Industry to Industry

ENERGY SECTOR

This sector accounts for 33% of Basque emissions.

Emissions in the last year have fallen by 3%, mainly due to lower emissions in the electricity sector. Final electricity consumption has been reduced by 2%, especially due to a reduction in industry and households.

As regards electricity production, there has been an increase in electricity production in Basque co-generation and combined cycle systems, which has led to an increase in emissions of 26%. However, the 32% reduction in electricity imports, as well as an improvement in the state generation mix due to lower production in coal-fired power plants, have led to an overall decrease in emissions in the sector.

Compared to 2005, emissions in this sector have been reduced by 42%, and by 22% compared to 1990, with a reduction in **CO_2 emissions per kwh produced** by 19% compared to 2005 and 53% compared to 1990.

TRANSPORT SECTOR

This sector accounts for 35% of emissions, and is the second largest source of emissions in the Basque Country. Approximately 96% of emissions in this sector are associated with road transport.

Emissions from this sector declined by 0.6% in 2019.

Compared to 2005, emissions have increased by 14%, mainly due to the increase in emissions from passenger cars.

For 1990, both emissions associated with the transport of goods and those associated with the transport of persons have almost doubled their emissions.

INDUSTRIAL SECTOR

This sector accounts for 18% of emissions in the Basque Country (direct emissions), although if we consider emissions associated with the electricity it consumes (indirect emissions) this percentage would increase to 29%.

Direct emissions in 2019 have been reduced by 3% compared to the previous year, in the context of industrial GDP growth.

Since 2005, emissions have fallen by 38%, and by 53% since 1990, which is a sign of the transformation that has taken place in this sector.

The efficiency of the industrial sector has improved in terms **of GHG/GDP emissions**, 51 percentage points since 2005 and 73 percentage points compared to 1990.

HOUSEHOLD AND SERVICES

The household and services sector emits 7% of all greenhouse gases in the Basque Autonomous Community (direct emissions). If we were to consider emissions associated with electricity consumed (indirect emissions) this percentage would increase to 15%.

Direct emissions have been reduced by 6% compared to 2018, as a result of lower consumption of natural gas and petroleum products in both sectors.

Household emissions have decreased by 11% since 2005, although it has increased by 33% over 1990. Emissions produced in the services sector have increased by 4% and 103% compared to 2005 and 1990, respectively.

AGRICULTURE, LIVESTOCK, AND FISHERIES SECTOR

This sector accounts for 3% of all emissions in the Basque Country.

In the last year, emissions from this sector have increased by 1% due to a slight increase in fuel consumption.

With respect to 2005 and 1990, emissions fell by 49% and 47%, respectively, related, on the one hand, to reduced energy consumption (petroleum and natural gas), a drop in the livestock census and a reduction in the doses of mineral fertiliser.

WASTE SECTOR

Emissions from this sector account for 4% of total emissions from the Basque Country. In 2019 emissions from this sector fell by 2%. Compared with 2005 and 1990, these emissions have decreased by 35% and 26% respectively.

This reduction in emissions is due to several factors, which include a lower discharge rate resulting from increased recycling, landfill pre-treatment, recovery, compost production, etc. In addition, this reduction in lower non-ETS emissions due to improvements in landfill gas collection and combustion.

Table 1.

Total GHG emissions by sector (thousands of tons CO_2 equivalent)[15]

Sector	1990	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy sector	7,800	10,522	7,702	7,607	7,858	6,617	6,488	6,945	6,239	6,604	6,289	6,089
Industry	7,247	5,488	5,534	4,405	4,026	3,606	3,664	3,626	3,580	3,720	3,486	3,378
Transportation	2,799	5,634	5,243	5,157	5,439	5,510	5,693	5,890	6,158	6,551	6,463	6,423
Household	632	946	890	777	814	788	716	764	694	860	911	840
Services	224	438	485	466	480	458	444	476	413	444	461	455
Agriculture	1,071	1,114	763	751	741	714	686	668	636	594	562	566
Waste	1,088	1,237	1,070	1,038	1,042	1,012	1,011	961	921	865	821	802
Total	**20,862**	**25,380**	**21,687**	**20,200**	**20,400**	**18,705**	**18,702**	**19,330**	**18,641**	**19,639**	**18,993**	**18,553**

15 Emission values from previous years may be subject to variations from previous publications due to the inclusion of new sources of emission, changes in source data or the changes/updates to calculation methodology.

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