![Instituto Nacional de Estadística]

Environmental accounts. Air Emission Accounts
Preview year 2022

The Spanish economy emitted 304.4 million tonnes of Greenhouse Gases in 2022, 3.1% more than in 2021.

These emissions have decreased by 26.9% since 2008

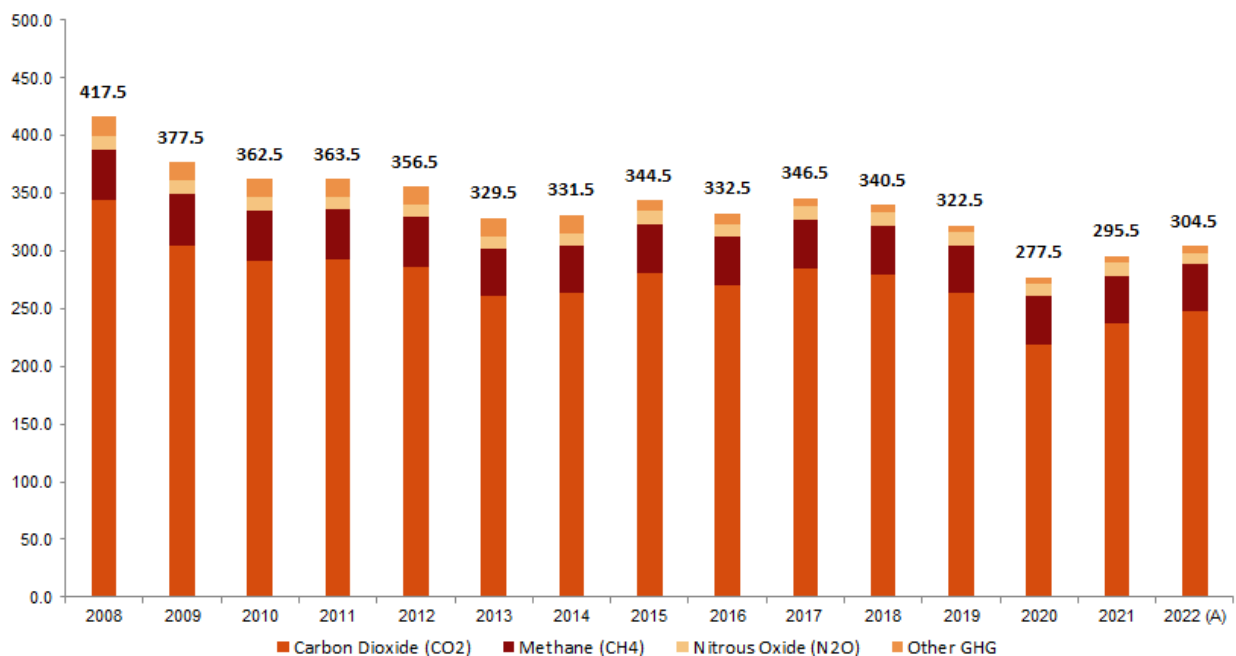## 22.7% of emissions corresponded to households

The Air Emission Account records the emissions produced by the resident economic units of the economy.

In 2022, Greenhouse Gas (GHG) emissions increased by 3.1%, standing at 304.4 million tonnes of Carbon Dioxide equivalent (tCO2e)[1].

Greenhouse Gas Emissions
Million tonnes of Carbon Dioxide equivalent (tCO$_2$e)

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[1] In order to make a comparison of atmospheric emissions of greenhouse gases other than carbon dioxide, all are converted to their carbon dioxide equivalent (CO$_2$e) value by multiplying the mass of the gas in question by its global warming potential (AR5).

Between 2008 (first year of the accounting series) and 2022, the decrease in GHG emissions was 26.9%.

There are different types of Greenhouse Gases. The main ones, due to their level of emissions, are Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxide (N_2O).

Carbon Dioxide emissions to the atmosphere increased by 4.5% in 2022. On the other hand, Methane emissions decreased by 2.1% and Nitrous Oxide decreased by 11.4% compared to the previous year.

Greenhouse Gas emissions by type of gas. 2022
Thousand tonnes of Carbon Dioxide equivalent (tCO$_2$e)

	Total	% of the total	% annual variation	Impact
CO_2 – Carbon dioxide	247,834.0	81.4	4.5	3,594
CH_4 – Methane	40,605.6	13.3	-2.1	-0,301
N_2O – Nitrous oxide	10,070.3	3.3	-11.4	-0,437
Other GHG	5,928.3	2.0	12.8	0,228
TOTAL	304,438.2	100.0	3.1	

Greenhouse Gas Emissions by branches of activity and households

In 2022, 24.4% of the total greenhouse gas emissions were concentrated in *Manufacturing*. *Households* accounted for 22.7% of the total and *Energy, water and waste* for 18.1%.

The branches of activity that increased their GHG emissions the most in 2022 were *Energy, water and waste* (22.6%) and *Transport and storage* (16.2%).
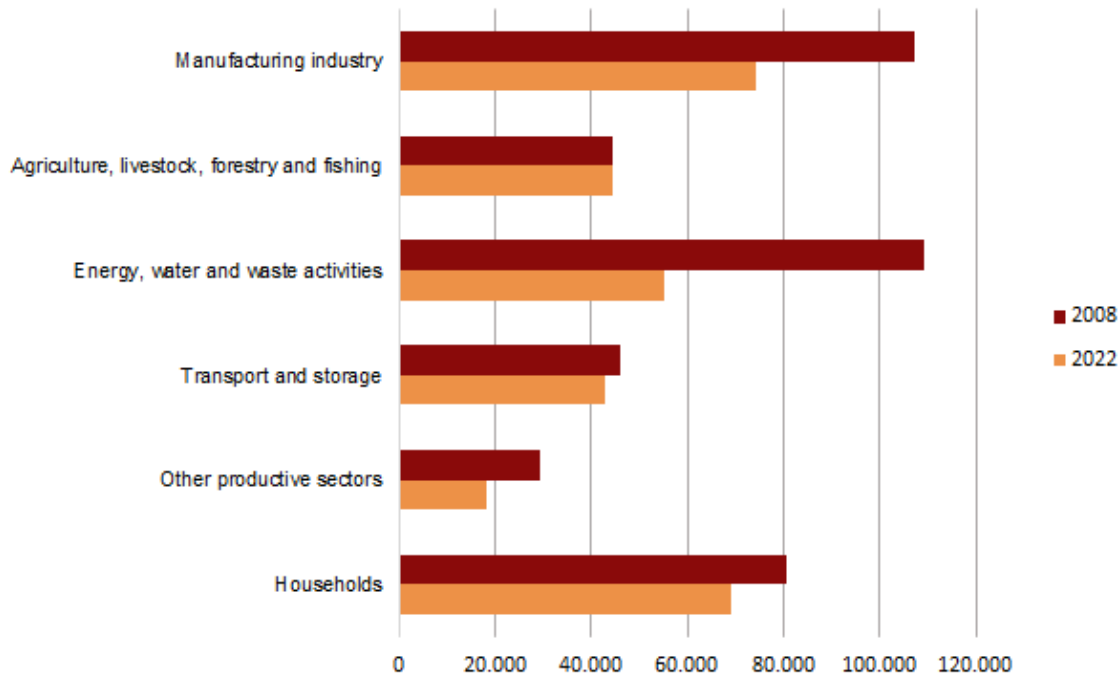
Greenhouse Gas Emissions by branches of activity and households
Thousand tonnes of Carbon Dioxide equivalent (tCO$_2$e)

	TOTAL GHG	% of the total	% annual variation	% variation 2008-2022
Manufacturing industry	74,416.6	24.4	-6.2	-30.5
Energy, water and waste activities	55,173.9	18.1	22.6	-49.5
Agriculture, livestock, forestry and fishing	44,413.0	14.6	-6.3	0.4
Transport and storage	43,002.4	14.1	16.2	-6.8
Other productive sectors	18,312.0	6.1	-2.2	-37.4
Households	69,120.3	22.7	1.8	-14.3
TOTAL	304,438.2	100.0	3.1	-26.9

Compared to 2008, the branches of activity where GHG emissions decreased the most were *Energy, water and waste* (-49.5%) and *Other activity branches* [2] (-37.4%).

Greenhouse Gas Emissions by branches of activity and households. 2008 and 2022

Thousand tonnes of Carbon Dioxide equivalent (tCO_2e)

The highest amounts of Carbon Dioxide emitted in 2022 corresponded to the *Manufacturing Industry* (69.2 million tonnes), *Households* (66.4 million) and *Transportation and storage services* (42.3 million).

Meanwhile, *Agriculture, livestock, forestry and fishing* emitted the highest amounts of Methane (63.3% of the total) and Nitrous Oxide (63.8%).

Greenhouse Gas Emissions by type of gas, branches of activity and households. 2022
Thousand tonnes of Carbon Dioxide equivalent (tCO_2e)

	TOTAL GHG	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	Other GHG
Manufacturing industry	74,416.5	69,150.7	2,350.2	463.2	2,452.4
Energy, water and waste activities	55,173.9	41,756.2	11,468.0	1,569.3	380.4
Agriculture, livestock, forestry and fishing	44,413.0	12,248.0	25,700.0	6,429.6	35.6
Transport and storage	43,002.4	42,327.1	41.9	422.0	211.4
Other productive sectors	18,312.1	15,945.8	301.8	624.5	1,439.9
Households	69,120.2	66,406.2	743.7	561.7	1,408.6
TOTAL	304,438.2	247,834.0	40,605.6	10,070.3	5,928.3

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[2] *Other activity branches* includes *Extractive industries*, *Construction*, and *Services excluding transport and storage services*.

Other atmospheric emissions. 2021

Other environmental problems that cause harmful effects on the environment and health are acidifying gases, tropospheric ozone precursor gases and particulates (fine dust).

Acidifying gases, which include Sulphur Oxides (SO_x) , Nitrogen Oxides (NO_x) and Ammonia (NH_3) measured in equivalent tonnes of Sulphur Dioxide (tSO_2e)[3] depending on their degree of acidification, fell by 0.5% in 2021.

Tropospheric ozone precursor gases, which correspond to Non-Methane Volatile Organic Compounds (NMVOC), Nitrogen Oxides (NO_x), Methane (CH_4) and Carbon Monoxide (CO) measured in equivalent tons of NMVOC[3], increased by 1.3%.

On the other hand, emissions of particles with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$) increased by 1.4%.

Emissions of atmospheric pollutants. 2021
Thousands of tonnes

	TOTAL	% annual variation	% variation 2008-2021
Acidifying gases	1,540.2	-0.5	-29.2
Tropospheric ozone precursors	1,628.6	1.3	-32.9
Particulates < 2.5µm	137.5	1.4	-14.4

The highest emissions of acidifying gases in 2021 corresponded to *Agriculture, livestock, forestry and fishing* (1,029.8 thousand tonnes of tSO_2e), *Manufacturing industry* (181.2 thousand) and *Households* (130.1 thousand).

Emissions of atmospheric pollutants by branches of activity and households. 2021
Thousands of tonnes

	Acidifying gases	Tropospheric ozone precursors	Particulates < 2.5µm
Agriculture, livestock, forestry and fishing	1,029.8	473.9	61.9
Manufacturing industry	181.2	385.7	14.2
Energy, water and waste activities	65.3	101.3	3.6
Transport and storage	100.3	174.0	5.5
Other productive sectors	33.5	83.8	6.0
Households	130.1	409.9	46.3
TOTAL	1,540.2	1,628.6	137.5

On the other hand, in 2021, *Agriculture, livestock, forestry and fishing* emitted the highest amounts of ozone precursor gases (473.9 thousand tonnes of equivalent NMVOC), followed by *Manufacturing* (385.7 thousand tonnes).

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[3] For the aggregation of gases due to environmental problems, the mass of the corresponding gas is multiplied by a calculation factor established by the European Environment Agency (EEA) and Eurostat.

The highest amounts of emissions of particles with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) corresponded to *Agriculture, livestock, forestry and fishing* (61.9 thousand tonnes) and *Households* (46.3).

Emissions of atmospheric pollutants by branches of activity and households. 2021
Percentage
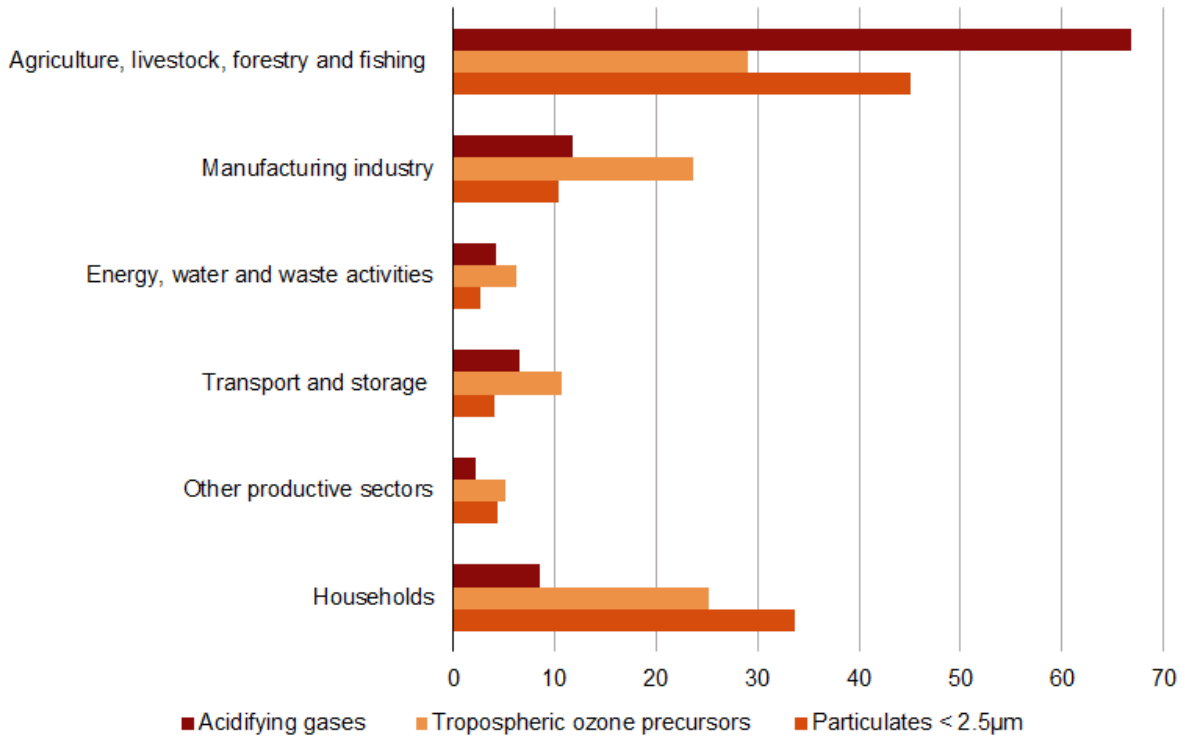
Data Review and Update

The data published today is provisional and will be revised when next year's data is released.

Methodological note

The objective of the Environmental Accounts (EA) is to integrate environmental information into the central system of National Accounts in a coherent way. They include a set of satellite accounts, which are transmitted annually, compiled using the accounting formats applicable to the different sectoral and territorial areas, with a strong use of physical data. They display the interactions among the economy, households and environmental factors.

The Air Emissions Accounts present data regarding the polluting emissions into the atmosphere, in a way that is compatible with the National Accounts System, registering the emitting agents, broken down by branch of economic activity and households as final consumers.

The estimates of the Air Emissions Accounts are made from the National Inventories of Emissions to the Atmosphere, prepared by the Ministry for Ecological Transition and the Demographic Challenge, which use the IPCC and EMEP/EEA methodology, with the NFR/CRF nomenclature (*Nomenclature for Reporting/Common Reporting Format*), which groups emissions into sectors, categories and subcategories.

For further information, the methodology can be accessed at:

https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176941&menu=metodologia&idp=1254735976603

The standardised methodological report can be found at:

https://www.ine.es/dynt3/metadatos/es/RespuestaDatos.html?oe=30084

INE statistics are produced in accordance with the Code of Good Practice for European Statistics, which is the basis for the institution's quality policy and strategy. For more information, see the section on Quality at INE and the Code of Best Practices on the INE website.

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