HELLENIC REPUBLIC
HELLENIC STATISTICAL AUTHORITY

Piraeus, 4 February 2025

AIR EMISSION ACCOUNTS: year 2022

The Hellenic Statistical Authority (ELSTAT) announces data on Air Emissions Accounts, for the year 2022 and revised data for the period 2013-2021. Data are collected from administrative sources, are provisional and are revised on an annual basis for the whole period.

Through this announcement, ELSTAT presents data on national emissions of greenhouse gases and other air pollutants resulting from economic activities of resident units and households, both within and outside the national territory. The relevant data are presented by certain economic sections of the Statistical Classification of Economic Activities (NACE Rev.2) and households (Tables 1-8, Graphs 1-9).

The emissions and the respective percentage distribution by type of gas per main economic activity sectors of the Statistical Classification of Economic Activities (NACE Rev.2) and households, are analyzed as follows:

Carbon dioxide (CO_2)

Emissions of CO_2 in 2022 were 67,144.0 thousand tonnes showing a decrease of 4.3% compared with 2021 (70,148.4 thousand tonnes) as shown in Table 1 and Graph 1. This was mainly caused by a notable decrease in the emissions of the section of "Transportation and storage" (Tables 2-3, Graph 2).

- The energy section of "Electricity, gas, steam and air conditioning supply" had the most important contribution to total CO_2 emissions, with a share of 28.7% in 2022. The corresponding share in 2021 was 29.4% (Table 3, Graph 2).
- The section of "Manufacturing" accounted for 24.5% of total CO_2 emissions in 2022 and for 23.2% in 2021 (Table 3, Graph 2).
- "Transportation and storage" contributed 23.5% into the total CO_2 emissions in 2022. In 2021, the corresponding share was 26.6% (Table 3, Graph 2).
- Households had also a significant share of CO_2 emissions, accounting for 18.6% of total CO_2 emissions in 2022. In 2021, the corresponding share was 16.7% (Table 3, Graph 2).

The total annual emissions of CO_2 and the year-on-year change (%) from 2013 to 2022 are shown in Table 1 and Graph 1.

Methane (CH_4)

In 2022, 93.0% of total CH_4 emissions derived from two economic sections: "Water supply; sewage, waste management and remediation" with share 50.5% and "Agriculture, forestry and fishing" with a share of 42.5%. In 2021, the respective contributions were 49.6% and 43.5% (Table 4, Graph 3).

Households did not contribute significantly to CH_4 emissions with a share of 2.4% in 2022 and 2.3% in 2021 (Table 4, Graph 3).

The total annual emissions of CH_4 from 2013 to 2022 are shown in Table 1 and Graph 6.

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Nitrous oxide (N_2O)

The section of "Agriculture, forestry and fishing" had the most significant contribution to N_2O emissions, with a share of 74.6% in 2022 and 75.8% in 2021 (Table 5, Graph 4).

Other economic sections that notably contributed to nitrous oxide's emissions were:

- "Transportation and storage" with a share of 10.1% in 2022 and 10.8% in 2021 (Table 5, Graph 4).
- "Water supply; sewage, waste management and remediation" with a share of 6.5% in 2022 and 6.2% in 2021. (Table 5, Graph 4).

The participation of Households in N_2O emissions accounted for 2.1% of total N_2O emissions in 2022 and for 1.9% in 2021. (Table 5, Graph 4).

The total annual emissions of N_2O from 2013 to 2022 are shown in Table 1 and Graph 6.

F-gases category (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride)

Hydrofluorocarbons' (HFCs) emissions came mostly from refrigeration and air conditioning operations through all economic activities and households. In 2022, the leading emitter of HFCs was the "Other services" section followed by "Manufacturing" with respective shares of 41.7% and 36.2% (Table 6, Graph 5). The participation of Households was also notable with 12.8% of total HFCs emissions in 2022 (Table 6, Graph 5).
The total annual emissions of HFCs from 2013 to 2022 are shown in Table 1 and Graph 6.

Perfluorocarbons' (PFCs) emissions came exclusively from the "Manufacturing" section.
The total annual emissions of PFCs and the year-on-year change (%) from 2013 to 2022 are shown in Table 1 and Graph 7.

Emissions of **Sulfur hexafluoride (SF_6)** came exclusively from the section of "Electricity, gas, steam and air conditioning supply".
The total annual emissions of SF_6 and the year-on-year change (%) from 2013 to 2022 are shown in Table 1 and Graph 8.

Air pollutants (NO_X, SO_X, NH_3, NMVOC, CO, PM10)

In 2022, major emitters of air pollutants were the economic sections of "Transportation and storage" with a share of 31.1%, "Manufacturing" with 12.9% and "Agriculture, forestry and fishing" with 12.1% (Table 8, Graph 9). Households had also a significant contribution to air pollutants' emissions with a share of 24.2% in 2022 (Table 8, Graph 9).
The total annual emissions of air pollutants from 2013 to 2022 are shown in Table 7.

Table 1. Emissions of greenhouse gases in 1,000 tonnes of CO_2 equivalent, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Carbon dioxide (CO_2)	88,456.7	85,720.1	83,667.3	81,394.7	86,675.5	85,561.0	80,738.1	69,452.0	70,148.4	67,144.0
Methane (CH_4)	11,918.8	11,712.0	11,504.4	11,134.7	11,487.8	11,651.7	11,422.1	11,411.1	11,777.0	11,825.2
Nitrous oxide (N_2O)	4,303.6	4,113.2	4,100.0	4,186.2	4,264.3	4,196.7	4,217.6	4,327.9	4,284.1	4,004.2
Hydrofluorocarbons (HFCs)	5,403.5	5,505.3	5,641.7	5,844.6	5,806.4	5,559.4	5,137.1	4,816.3	4,675.6	4,557.0
Perfluorocarbons (PFCs)	156.1	121.7	108.0	122.0	113.6	122.1	123.6	133.5	111.2	87.4
Sulfur hexafluoride (SF_6)	5.3	5.1	5.2	5.4	5.2	5.1	5.1	5.1	5.0	5.0
TOTAL	**110,244.0**	**107,177.3**	**105,026.7**	**102,687.5**	**108,352.9**	**107,095.9**	**101,643.5**	**90,145.8**	**91,001.3**	**87,622.8**

*Provisional data

Table 2. Emissions of carbon dioxide (CO_2) in 1,000 tonnes by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	766.7	840.4	923.7	882.4	853.9	820.1	809.6	1,332.7	1,117.4	1,142.7
Mining and quarrying	79.1	57.9	85.4	89.4	99.1	97.5	70.2	65.1	67.3	36.7
Manufacturing	17,154.1	17,966.5	17,270.6	18,082.4	18,093.8	17,274.2	16,105.9	14,975.7	16,262.8	16,481.1
Electricity, gas, steam and air conditioning supply	44,475.0	40,784.4	35,912.0	31,759.6	35,358.9	33,714.6	27,834.9	20,077.7	20,612.9	19,247.8
Water supply; sewage, waste management and remediation	104.3	106.5	64.7	88.1	108.3	66.2	73.4	62.5	92.3	71.4
Construction	241.5	259.7	233.1	253.7	172.1	211.0	142.2	166.6	195.5	207.7
Transportation and storage	12,161.3	12,807.5	14,591.1	16,046.1	18,027.8	20,250.8	21,970.6	19,663.1	18,658.6	15,786.9
Other services	1,843.2	1,618.4	1,870.7	1,784.1	1,662.9	1,563.4	1,579.4	1,642.7	1,397.9	1,656.0
Households	11,631.3	11,278.6	12,716.0	12,408.8	12,298.6	11,563.2	12,151.8	11,465.8	11,743.8	12,513.7
TOTAL	**88,456.7**	**85,720.1**	**83,667.3**	**81,394.7**	**86,675.5**	**85,561.0**	**80,738.1**	**69,452.0**	**70,148.4**	**67,144.0**

*Provisional data

Table 3. Percentage distribution of CO_2 emissions by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	0.9	1.0	1.1	1.1	1.0	1.0	1.0	1.9	1.6	1.7
Mining and quarrying	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing	19.4	21.0	20.6	22.2	20.9	20.2	19.9	21.6	23.2	24.5
Electricity, gas, steam and air conditioning supply	50.3	47.6	42.9	39.0	40.8	39.4	34.5	28.9	29.4	28.7
Water supply; sewage, waste management and remediation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Construction	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Transportation and storage	13.7	14.9	17.4	19.7	20.8	23.7	27.2	28.3	26.6	23.5
Other services	2.1	1.9	2.2	2.2	1.9	1.8	2.0	2.4	2.0	2.5
Households	13.1	13.2	15.2	15.2	14.2	13.5	15.1	16.5	16.7	18.6
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*Provisional data

Table 4. Percentage distribution of CH_4 emissions by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	45.4	44.6	44.4	45.1	43.5	43.2	43.6	45.4	43.5	42.5
Mining and quarrying	11.1	10.6	9.9	7.2	8.0	7.7	5.9	3.1	2.6	3.0
Manufacturing	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5
Electricity, gas, steam and air conditioning supply	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	1.0	0.8
Water supply; sewage, waste management and remediation	39.3	40.6	41.3	43.4	43.9	44.9	46.2	47.5	49.6	50.5
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and storage	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.3
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	2.9	2.8	2.9	2.7	2.6	2.4	2.4	2.2	2.3	2.4
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*Provisional data

Table 5. Percentage distribution of N_2O emissions by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	78.3	76.6	75.2	75.4	75.1	73.9	74.4	75.8	75.8	74.6
Mining and quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	3.3	3.9	3.9	3.5	3.5	3.7	3.1	2.9	2.7	3.8
Electricity, gas, steam and air conditioning supply	3.0	2.9	2.6	2.1	2.3	2.2	1.7	0.9	0.9	1.0
Water supply; sewage, waste management and remediation	6.4	6.7	6.6	6.5	6.5	6.7	6.6	6.1	6.2	6.5
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and storage	5.3	6.0	7.6	8.7	9.0	9.8	10.5	10.9	10.8	10.1
Other services	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.8
Households	2.0	2.1	2.3	2.1	2.0	2.0	2.0	1.7	1.9	2.1
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*Provisional data

Table 6. Percentage distribution of HFCs emissions by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	0.4	0.5	0.5	0.6	0.4	0.4	0.4	0.6	0.6	0.7
Mining and quarrying	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing	51.7	52.1	50.9	50.3	49.7	50.6	49.0	42.5	43.9	36.2
Electricity, gas, steam and air conditioning supply	0.8	0.9	0.9	0.9	0.7	0.6	0.8	0.8	0.7	0.6
Water supply; sewage, waste management and remediation	1.0	1.0	1.0	1.2	1.1	1.2	1.3	1.4	1.4	1.4
Construction	4.1	4.0	3.9	3.8	3.7	3.9	4.3	4.0	4.2	3.8
Transportation and storage	2.3	2.3	2.1	1.9	2.0	1.8	1.8	1.8	2.2	2.6
Other services	29.0	28.4	29.4	29.3	31.4	30.7	31.0	35.3	35.3	41.7
Households	10.7	10.8	11.3	12.1	10.8	10.7	11.4	13.5	11.7	12.8
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*Provisional data

Table 7. Emissions of air pollutants in 1,000 tonnes, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Nitrogen Oxides (NO_X)	419.0	417.9	439.6	469.7	510.8	541.9	559.4	530.9	488.0	412.2
Sulfur Oxides (SO_X)	247.7	230.7	256.2	256.7	293.1	323.5	328.5	198.5	156.6	118.1
Ammonia (NH_3)	72.2	68.7	67.5	67.5	67.0	66.4	66.3	68.6	68.0	64.2
Non-Methane Volatile Organic Compounds (NMVOC)	181.1	177.2	170.6	163.0	159.1	155.5	155.6	147.8	145.8	142.0
Carbon Monoxide (CO)	547.2	550.9	526.8	477.6	490.7	475.3	473.3	441.7	436.2	446.8
Particulate Matter (PM10)	80.1	85.0	80.4	82.2	82.3	79.1	80.6	80.4	76.0	71.8
TOTAL	**1,547.3**	**1,530.3**	**1,541.0**	**1,516.7**	**1,603.1**	**1,641.8**	**1,663.8**	**1,467.9**	**1,370.6**	**1,255.0**

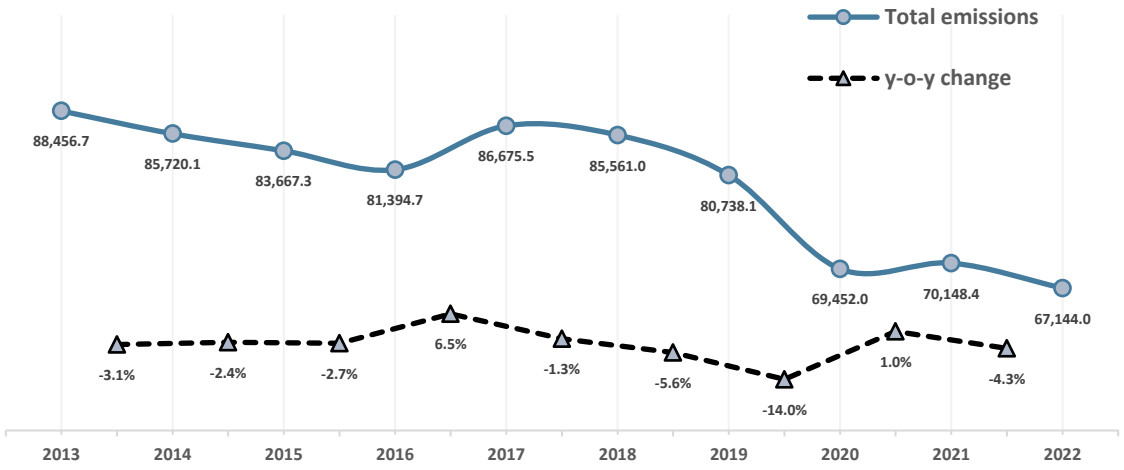
*Provisional data

Table 8. Percentage distribution of total air pollutants' emissions by economic sector, 2013 – 2022 *

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry and fishing	11.3	10.2	9.7	9.8	9.6	8.8	8.8	11.2	11.1	12.1
Mining and quarrying	1.1	1.1	1.1	0.9	0.9	0.9	0.6	0.5	0.5	0.6
Manufacturing	10.3	11.3	10.5	10.9	9.8	10.2	9.8	10.8	11.6	12.9
Electricity, gas, steam and air conditioning supply	13.6	12.2	11.5	9.7	10.3	9.4	8.5	6.5	7.3	7.6
Water supply; sewage, waste management and remediation	6.0	6.0	5.9	6.0	5.8	5.6	5.5	6.3	6.7	7.4
Construction	1.2	1.5	1.5	1.7	1.2	1.0	1.0	1.2	1.2	1.4
Transportation and storage	26.4	26.9	31.0	35.6	38.2	42.5	44.8	41.4	37.6	31.1
Other services	2.7	2.5	2.7	2.6	2.1	2.0	2.1	3.0	1.9	2.9
Households	27.6	28.2	26.2	23.0	22.1	19.6	18.8	19.2	22.0	24.2
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

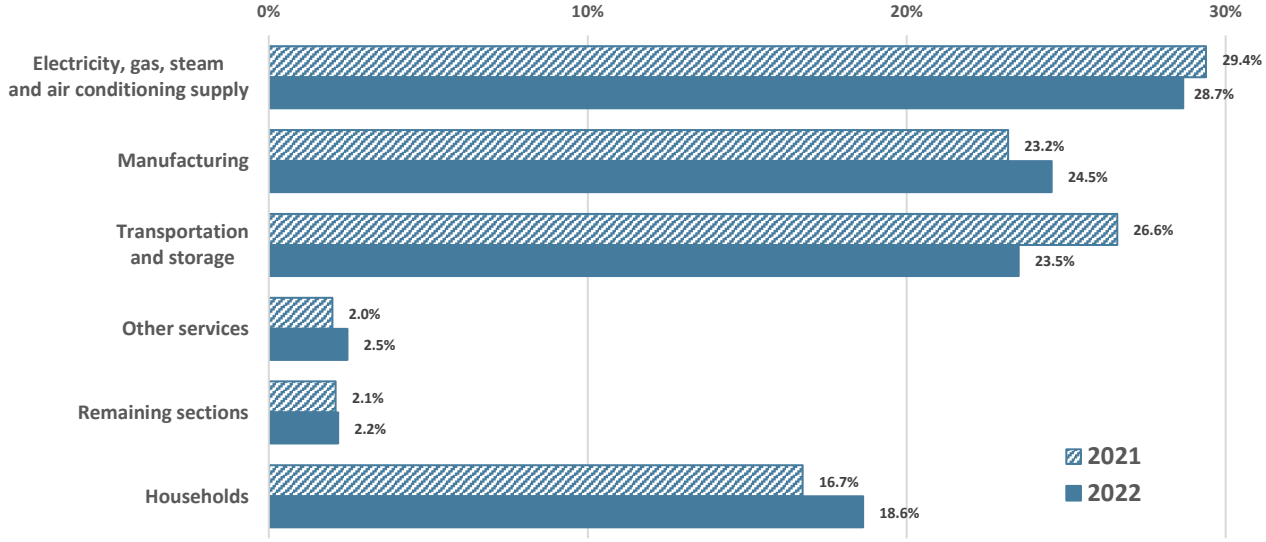
*Provisional data

Graph 1. Emissions of carbon dioxide (CO_2) in 1,000 tonnes and year-on-year change (%), 2013 – 2022 *



*Provisional data

Graph 2. Percentage distribution of carbon dioxide (CO_2) emissions to main sections of the statistical classification of economic activities (NACE Rev.2) and households, 2021 * and 2022 *



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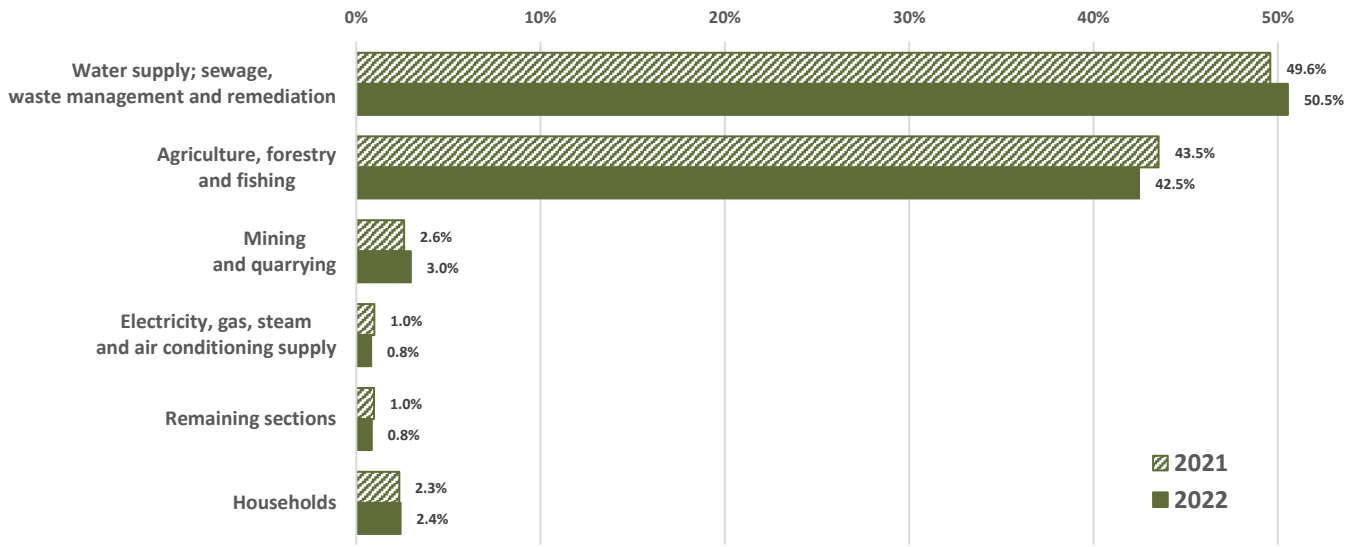
Graph 3. Percentage distribution of methane (CH_4) emissions to main sections of the statistical classification of economic activities (NACE Rev.2) and households, 2021 * and 2022 *



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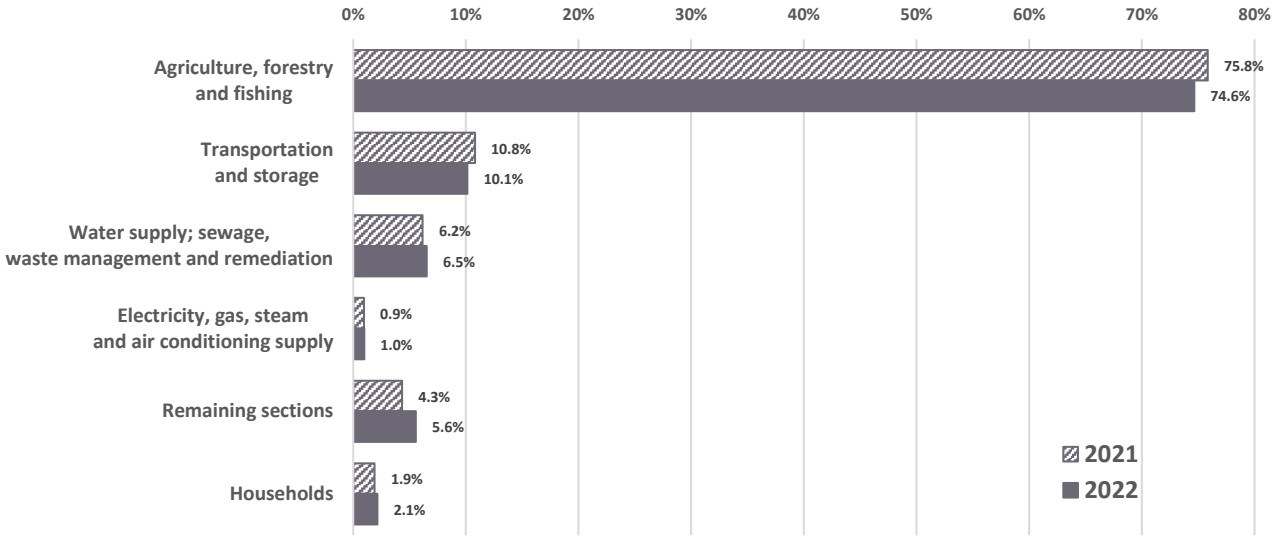
Graph 4. Percentage distribution of nitrous oxide (N_2O) emissions to main sections of the statistical classification of economic activities (NACE Rev.2) and households, 2021 * and 2022 *



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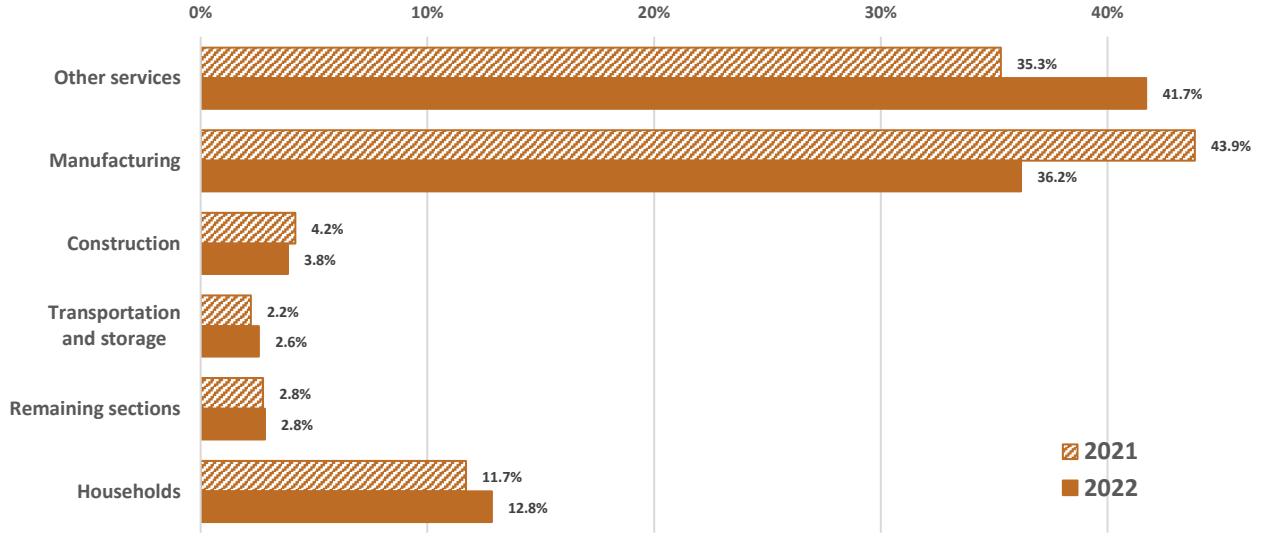
Graph 5. Percentage distribution of hydrofluorocarbons (HFCs) emissions to main sections of the statistical classification of economic activities (NACE Rev.2) and households, 2021 * and 2022 *



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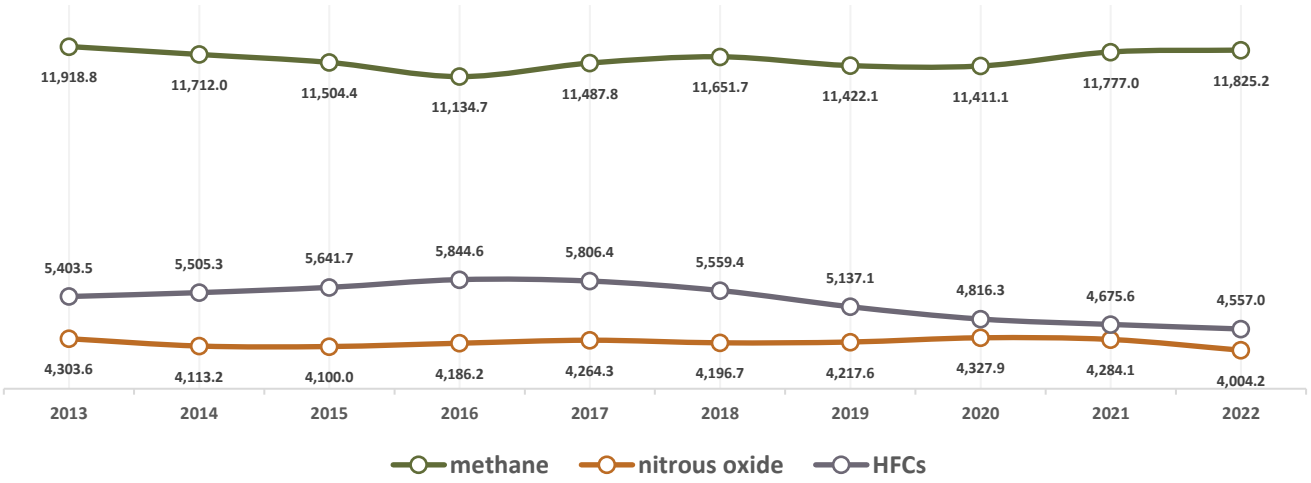
Graph 6. Emissions of methane (CH_4), nitrous oxide (N_2O) and hydrofluorocarbons (HFCs) in 1,000 tonnes of CO_2 equivalent, 2013 – 2022 *



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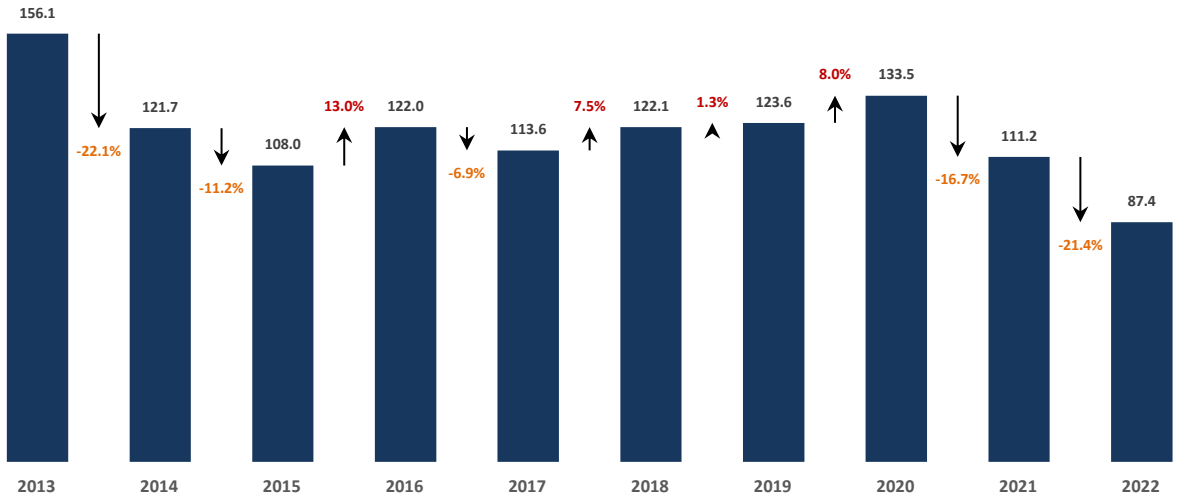
Graph 7: Emissions of perfluorocarbons (PFCs) in 1,000 tonnes of CO_2 equivalent and year-on-year change (%), 2013 – 2022 *



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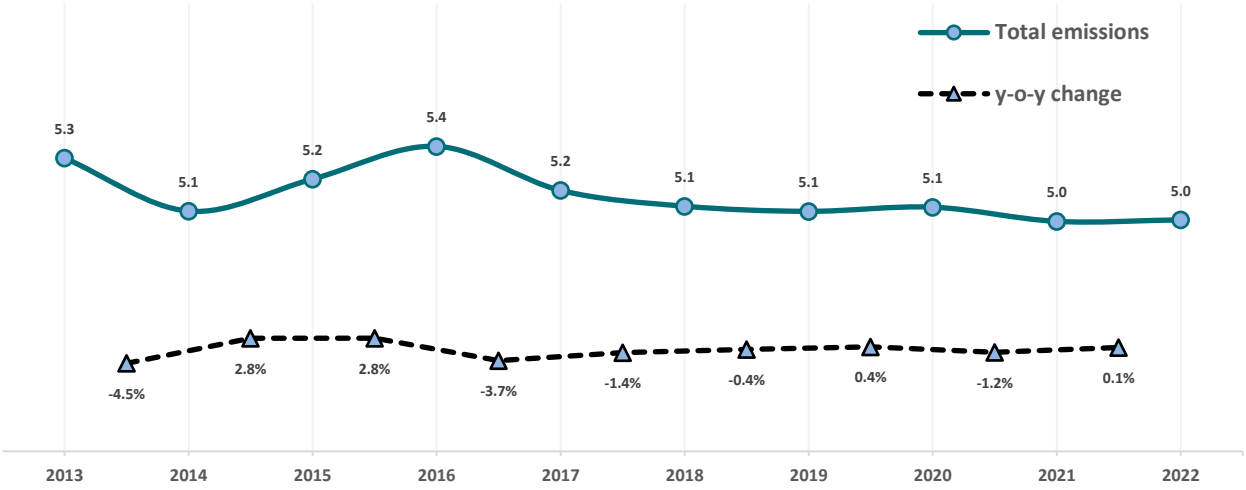
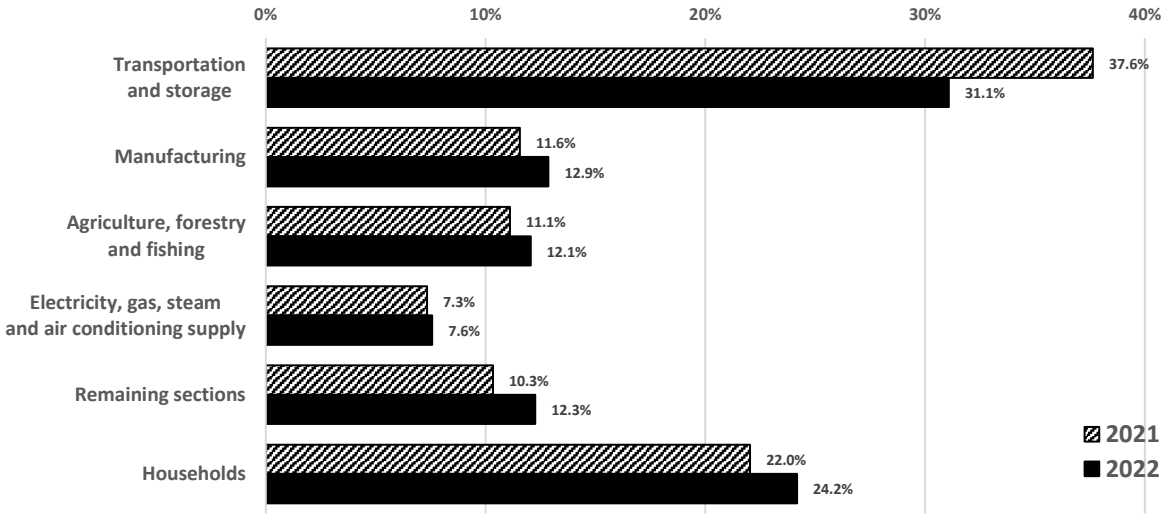
Graph 8: Emissions of sulfur hexafluoride (SF_6) in 1,000 tonnes of CO_2 equivalent and year-on-year change (%), 2013 – 2022 *



*Provisional data

Graph 9. Percentage distribution of air pollutants' emissions to main sections of the statistical classification of economic activities (NACE Rev.2) and households, 2021 * and 2022 *



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EXPLANATORY NOTES

Legal framework: The Air Emissions Accounts are compiled pursuant to Regulation 691/2011 of the European Parliament and of the Council (Section 1) which provides for and lays down the methodological frame for the compilation of Air Emissions Accounts.

Methodology: The main source of primary data on greenhouse gases and other air emissions is the annual inventory submission of Greece for GHG and air pollutants. The inventory is compiled and submitted by the Ministry of Environment and Energy, in the frame of the Kyoto protocol on greenhouse gases and other air pollutants to UNFCCC and CLRTAP respectively.
Data are presented by certain economic sections of the Statistical Classification of Economic Activities (NACE Rev.2) and households. "Other Services" sector corresponds to the NACE Rev.2 sections G, I-U.
Possible small deviations in sums are due to rounding.

Concepts and Definitions: Air Emissions Accounts include the following gases:

1. **Carbon dioxide (CO_2)**: Carbon dioxide (CO_2) is the most important of the greenhouse gases because it is emitted in large quantities by several economic sectors. In Greece, the main source of carbon dioxide (CO_2) emissions is the use of solid fuels for electricity production.
2. **Methane (CH_4)**: Methane (CH_4) holds second place as regards air emissions that contribute to the increase of the world temperature. It is expressed in CO_2 equivalents. Methane (CH_4) is approximately 28 times more powerful than carbon dioxide (CO_2) in terms of warming the climate system. In Greece, the main sources of methane emissions are agriculture and waste management.
3. **Nitrous oxide (N_2O)**: Nitrous oxide holds the third place as regards air emissions that contribute to the increase of the world temperature. It is expressed in CO_2 equivalents. Nitrous oxide (N_2O) is approximately 265 times more powerful than carbon dioxide (CO_2) in terms of warming the climate system. In Greece, the main sources of nitrous oxide emissions are agriculture and water transport.
4. **Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs)**: They are in fourth place as regards air emissions that contribute to the increase of the world temperature. They are expressed in CO_2 equivalents. HFCs and PFCs are approximately 7,390 (CF_4) to 14,800 (HFC-23) times more powerful than carbon dioxide (CO_2) in terms of warming the climate system. In Greece, the main sources of these gases are wholesale and retail trade and manufacturing.
5. **Sulfur hexafluoride (SF_6)**: Sulfur hexafluoride (SF_6) holds the fifth place as regards air emissions that contribute to the increase of the world temperature. It is expressed in CO_2 equivalents. Sulfur hexafluoride is approximately 22,800 times more powerful than carbon dioxide (CO_2) in terms of warming the climate system. In Greece, the main source of sulfur hexafluoride emissions is the transfer and distribution of electricity.
6. **Air pollutants (NO_X, SO_X, NH_3, NMVOCs, CO, PM10)**: In Greece, the main source of air pollutants' emissions is the transport sector.

Resident Principle: Air Emissions Accounts follow the residence principle for land, water and air transport. In contrast with the territory principle, the residence adjustment is applied (a) to record the air emissions arising from activities of resident units, regardless of where these emissions actually occur, and (b) to exclude the emission relevant activities of non-residents on the national territory. This is the reason why the total emissions reported in Air Emissions Accounts following the residence principle deviate from those in the Annual Inventory Submission Report of Greece following the territory principle.

References: Complete datasets and metadata information are available on ELSTAT's portal (www.statistics.gr), at the following link:
http://www.statistics.gr/en/statistics/-/publication/SOP08/-