HELLENIC REPUBLIC
HELLENIC STATISTICAL AUTHORITY

Piraeus, 3 February 2022

PRESS RELEASE

AIR EMISSION ACCOUNTS: years 2010-2019

The Hellenic Statistical Authority (ELSTAT) announces data on Air Emissions Accounts, for the period 2010-2019, which are collected from administrative sources.

Through this press release, 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)

- 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 34.0% in 2019. The corresponding share in 2018 was 39.1% (Table 3, Graph 1).
- The section of "Transportation and storage" accounted for 28.0% of total CO_2 emissions in 2019 and for 24.4% in 2018 (Table 3, Graph 1).
- "Manufacturing" contributed 19.4% into the total CO_2 emissions in 2019. In 2018, the corresponding share was 19.7% (Table 3, Graph 1).
- The sector of "Other services" accounted for 1.6% of total CO_2 emissions in 2019 and for 1.5% in 2018 (Table 3, Graph 1).
- Households had also a significant share in CO_2 emissions, accounting for 15.8% of total CO_2 emissions in 2019. In 2018, the corresponding share was 14.2% (Table 3, Graph 1).

Carbon dioxide emissions in 2019, showed a decrease in comparison with 2018 which was caused mainly by a respective decrease in the sections of "Electricity, gas, steam and air conditioning supply" and "Manufacturing" (Tables 1-3, Graphs 1-2).

The total annual emissions and the year-on-year change (%) of CO_2 from 2010 to 2019 are shown in Table 1 and Graph 2.

Methane (CH_4)

In 2019, 90% of CH_4 emissions derived from two economic sections with almost equal shares: "Water supply; sewerage, waste management and remediation" and "Agriculture, forestry and fishing" with shares of 45.0% and 44.6%. In 2018, the respective contribution was 43.9% for both sections (Table 4, Graph 3).

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Households participated in CH_4 emissions with a share of 2.5% in both 2019 and 2018 (Table 4, Graph 3).

The total annual emissions of CH_4 from 2010 to 2019 are shown in Table 1 and Graph 5.

Nitrous oxide (N_2O)

The section of "Agriculture, forestry and fishing" had the most significant contribution to N_2O emissions, with a share of 73.8% in 2019 and 73.1% in 2018 (Table 5, Graph 4).

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

- "Transportation and storage" with a share of 10.8% in 2019 and 10.1% in 2018 (Table 5, Graph 4).
- "Water supply; sewerage, waste management and remediation" with a share of 6.8% in 2019 and 6.9% in 2018. (Table 5, Graph 4).

The participation of Households in N_2O emissions is accounted for 5.1% of total N_2O emissions in 2019 and for 5.2% in 2018. (Table 5, Graph 4).

The total annual emissions of N_2O from 2010 to 2019 are shown in Table 1 and Graph 5.

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

Hydrofluorocarbons' (HFCs) emissions came mostly from refrigeration and air conditioning operations through all economic activities and households. The leading emitter of HFCs was the "Manufacturing" section followed by "Other services" with respective shares of 48.2% and 31.5% in 2019 (Table 6, Graph 6). The participation of Households was also notable with 12.0% of total HFCs emissions in 2019 (Table 6, Graph 6).
The total annual emissions of HFCs from 2010 to 2019 are shown in Table 1 and Graph 5.

Perfluorocarbons' (PFCs) emissions came exclusively from the "Manufacturing" section.
The total annual emissions and the year-on-year change (%) of PFCs from 2010 to 2019 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 and the year-on-year change (%) of SF_6 from 2010 to 2019 are shown in Table 1 and Graph 8.

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

Major emitters of air pollutants were the economic sections of "Transportation and storage" with a share of 46.7%, "Manufacturing" with 8.7% and "Agriculture, forestry and fishing" with 8.6% (Table 8, Graph 9). Households had also a significant contribution to air pollutants' emissions with a share of 19.4% in 2019 (Table 8, Graph 9).

Table 1. Emissions of greenhouse gases in 1,000 tonnes of CO_2 equivalent, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Carbon dioxide (CO_2)	106,831.8	103,557.0	99,982.8	88,473.3	85,702.8	83,660.7	81,369.0	86,624.8	85,590.8	81,029.7
Methane (CH_4)	11,087.7	10,954.4	10,790.0	10,545.1	10,336.2	10,165.8	9,818.7	10,114.4	10,215.3	10,045.1
Nitrous oxide (N_2O)	5,667.7	5,399.4	4,968.7	4,638.7	4,441.9	4,440.2	4,538.3	4,613.1	4,561.4	4,623.2
Hydrofluorocarbons (HFCs)	4,467.8	4,747.2	5,153.9	5,741.5	5,843.0	5,999.8	6,223.9	6,177.9	5,907.6	5,447.2
Perfluorocarbons (PFCs)	129.4	110.5	147.8	172.6	134.6	119.5	135.2	125.8	135.3	137.1
Sulfur hexafluoride (SF_6)	5.9	5.1	5.0	5.2	4.9	5.1	5.2	5.0	4.9	4.9

Table 2. Emissions of carbon dioxide (CO_2) in 1,000 tonnes by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	2,016	2,027	1,109	725	752	801	749	707	694	691
Mining and quarrying	83	97	70	75	52	77	80	83	86	66
Manufacturing	18,065	13,982	15,123	16,939	17,612	16,876	17,674	17,609	16,837	15,714
Electricity, gas, steam and air conditioning supply	48,570	50,761	51,164	44,420	40,693	35,791	31,617	35,168	33,454	27,530
Water supply; sewerage, waste management and remediation	121	48	39	95	91	49	71	79	49	65
Construction	399	444	171	221	236	209	223	136	178	153
Transportation and storage	17,757	15,904	14,595	12,537	13,099	14,920	16,479	18,590	20,874	22,698
Other services	2,225	1,951	1,982	1,727	1,442	1,615	1,522	1,351	1,246	1,332
Households	17,596	18,344	15,730	11,734	11,725	13,323	12,953	12,902	12,174	12,780
TOTAL	**106,832**	**103,557**	**99,983**	**88,473**	**85.703**	**83,661**	**81,369**	**86,625**	**85,591**	**81,030**

** Provisional data*

Table 3. Percentage distribution of CO_2 emissions by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	1.9	2.0	1.1	0.8	0.9	1.0	0.9	0.8	0.8	0.9
Mining and quarrying	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing	16.9	13.5	15.1	19.1	20.5	20.2	21.7	20.3	19.7	19.4
Electricity, gas, steam and air conditioning supply	45.5	49.0	51.2	50.2	47.5	42.8	38.9	40.6	39.1	34.0
Water supply; sewerage, waste management and remediation	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Construction	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2
Transportation and storage	16.6	15.4	14.6	14.2	15.3	17.8	20.3	21.5	24.4	28.0
Other services	2.1	1.9	2.0	2.0	1.7	1.9	1.9	1.6	1.5	1.6
Households	16.5	17.7	15.7	13.3	13.7	15.9	15.9	14.9	14.2	15.8
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

** Provisional data*

Table 4. Percentage distribution of CH_4 emissions by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	44.9	45.3	45.5	45.7	44.8	44.8	45.6	44.0	43.9	44.6
Mining and quarrying	11.1	11.7	12.7	11.2	10.8	10.0	7.3	8.2	7.8	6.0
Manufacturing	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Electricity, gas, steam and air conditioning supply	0.7	0.9	0.8	0.8	0.7	0.7	0.8	1.0	0.9	0.9
Water supply; sewerage, waste management and remediation	40.1	38.5	37.0	38.8	40.2	40.7	42.8	43.2	43.9	45.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and storage	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	2.3	2.8	3.2	2.9	2.9	3.0	2.7	2.7	2.5	2.5
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

** Provisional data*

Table 5. Percentage distribution of N_2O emissions by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	70.6	70.4	71.7	77.4	75.8	74.4	74.7	74.2	73.1	73.8
Mining and quarrying	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Manufacturing	8,8	9,7	7,3	1,9	2,4	2,4	2,0	2,0	2,2	1,6
Electricity, gas, steam and air conditioning supply	2,8	3,0	3,3	3,1	3,0	2,7	2,1	2,3	2,2	1,7
Water supply; sewerage, waste management and remediation	5,7	5,8	6,3	6,7	6,9	6,8	6,7	6,7	6,9	6,8
Construction	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Transportation and storage	6.6	6.0	5.9	5.5	6.2	7.8	9.0	9.3	10.1	10.8
Other services	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Households	5.2	4.9	5.2	5.2	5.4	5.6	5.3	5.2	5.2	5.1
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

** Provisional data*

Table 6. Percentage distribution of HFCs emissions by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4
Mining and quarrying	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Manufacturing	42.6	43.2	50.7	51.7	51.9	50.7	50.1	51.3	50.6	48.2
Electricity, gas, steam and air conditioning supply	0.6	0.6	0.7	0.7	0.8	0.7	0.8	0.6	0.6	0.7
Water supply; sewerage, waste management and remediation	0.7	0.7	0.8	0.9	1.0	1.0	1.2	1.1	1.1	1.4
Construction	4.0	3.9	3.5	3.6	3.5	3.4	3.3	3.3	3.4	3.7
Transportation and storage	3.9	3.4	3.0	2.6	2.6	2.4	2.1	2.3	2.1	2.0
Other services	34.6	35.2	28.9	29.1	28.5	29.4	29.4	29.9	30.5	31.5
Households	13.1	12.6	12.0	10.9	11.2	11.9	12.5	11.2	11.1	12.0
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

** Provisional data*

Table 7. Emissions of air pollutants in 1,000 tonnes, 2010 - 2019

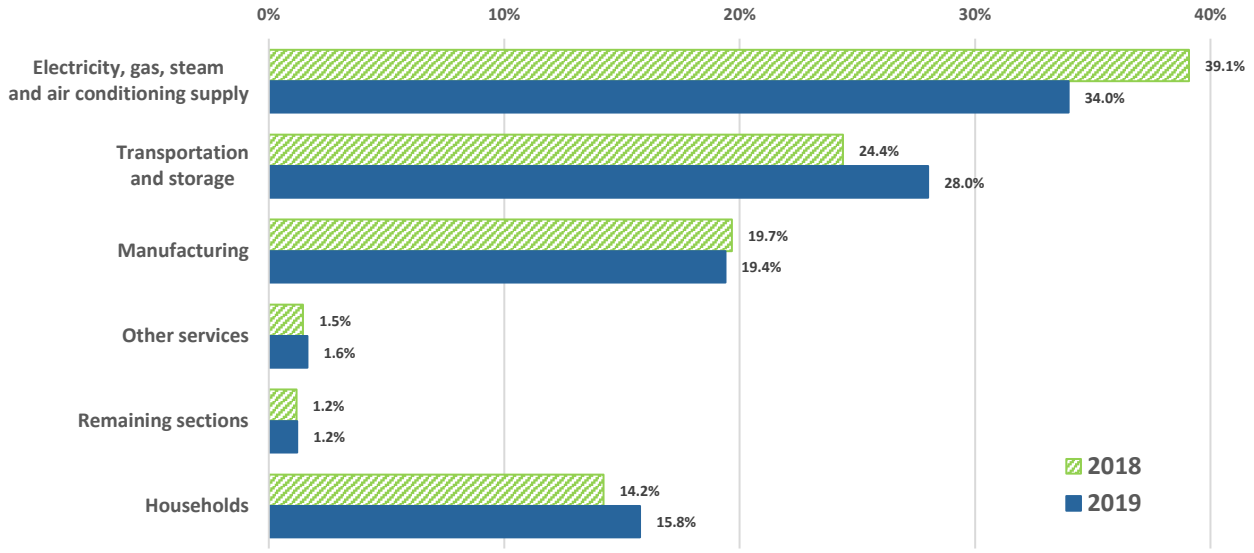
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nitrogen Oxides (NO_X)	605.0	556.5	504.3	437.2	437.5	469.0	500.2	544.9	580.1	555.5
Sulphur Oxides (SO_X)	419.8	342.8	313.9	247.7	230.7	256.2	256.7	293.1	323.4	328.5
Ammonia (NH_3)	71.2	70.3	68.1	68.1	65.0	64.2	64.1	63.6	63.3	63.8
Non-Methane Volatile Organic Compounds (NMVOC)	222.9	207.8	200.0	180.6	177.0	171.2	164.0	161.2	156.5	155.6
Carbon Monoxide (CO)	635.5	616.7	657.8	562.5	570.3	553.0	498.8	512.8	494.0	493.5
Particulate Matter (PM10)	108.0	94.8	91.8	83.8	87.3	83.5	85.4	86.5	83.0	81.1
TOTAL	**2,062.5**	**1,888.9**	**1,836.0**	**1,579.8**	**1,567.7**	**1,597.0**	**1,569.1**	**1,662.1**	**1,700.4**	**1,678.1**

Table 8. Percentage distribution of total air pollutants' emissions by economic sector, 2010 - 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018*	2019*
Agriculture, forestry and fishing	9.9	9.8	13.0	11.1	9.7	9.3	9.3	9.1	8.2	8.6
Mining and quarrying	0.9	1.0	1.0	1.1	1.1	1.0	0.8	0.9	0.9	0.6
Manufacturing	9.6	8.7	8.6	9.5	10.2	9.3	9.7	8.8	9.0	8.7
Electricity, gas, steam and air conditioning supply	15.8	14.7	12.7	13.2	11.8	10.9	9.1	9.7	8.6	7.8
Water supply; sewerage, waste management and remediation	4.5	4.8	4.9	5.8	5.8	5.7	5.7	5.5	5.4	5.5
Construction	1.9	1.2	0.8	1.2	1.5	1.5	1.7	1.3	1.1	1.1
Transportation and storage	31.9	31.7	31.1	28.7	29.3	33.6	38.4	41.2	45.9	46.7
Other services	2.4	2.1	2.0	2.4	2.1	2.2	2.1	1.7	1.4	1.6
Households	23.2	25.9	26.0	27.1	28.6	26.6	23.1	21.9	19.7	19.4
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

** Provisional data*

Graph 1. Percentage distribution of carbon dioxide (CO_2) emissions to main sections of the Statistical Classification of Economic Activities (NACE Rev.2) and Households, 2018* και 2019*



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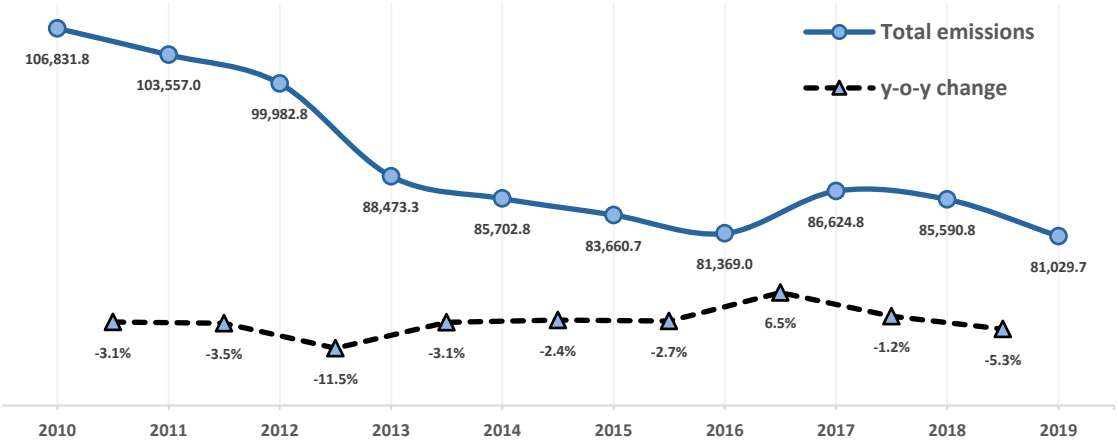
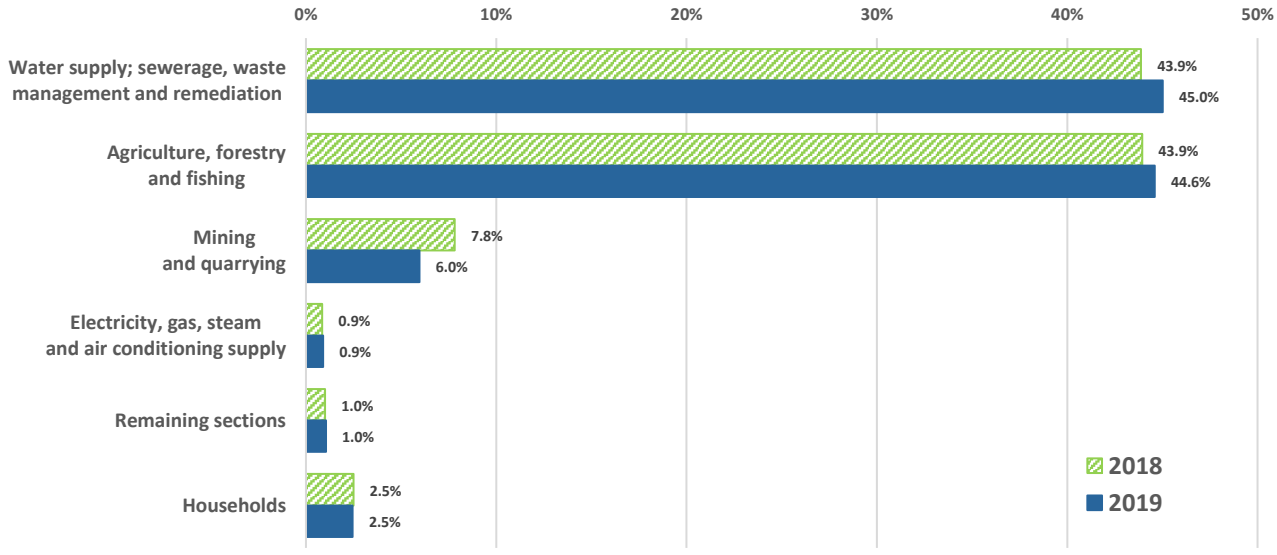
Graph 2. Total annual emissions (1,000 tonnes) and year-on-year change (%) of carbon dioxide (CO_2), 2010 - 2019

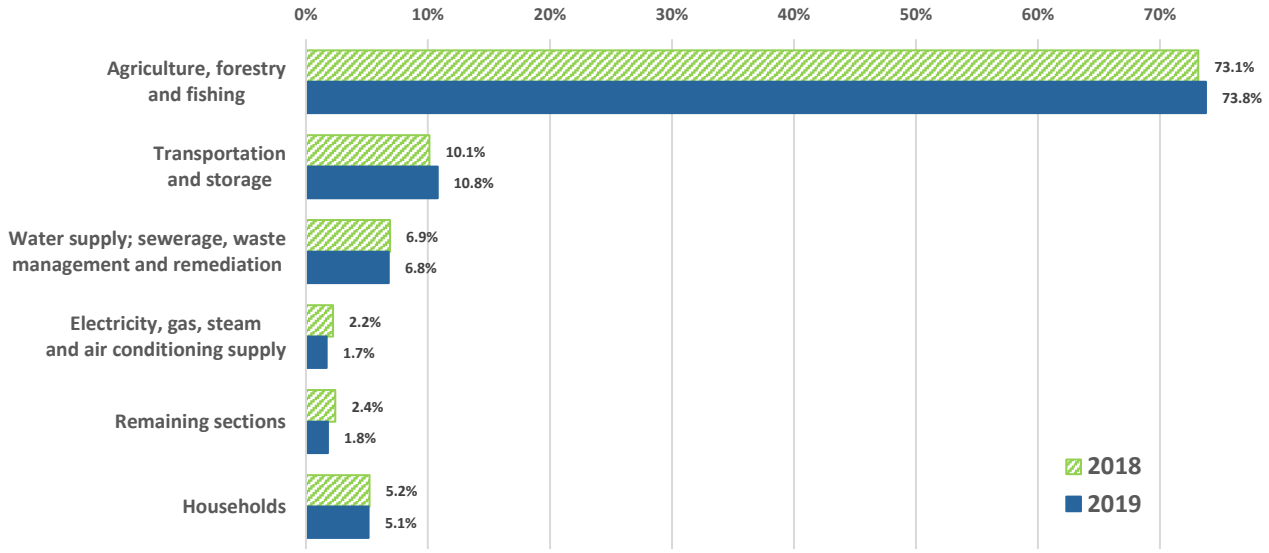


Graph 3. Percentage distribution of methane (CH_4) emissions to main sections of the Statistical Classification of Economic Activities (NACE Rev.2) and Households, 2018* και 2019*



** Provisional Data*

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, 2018* και 2019*



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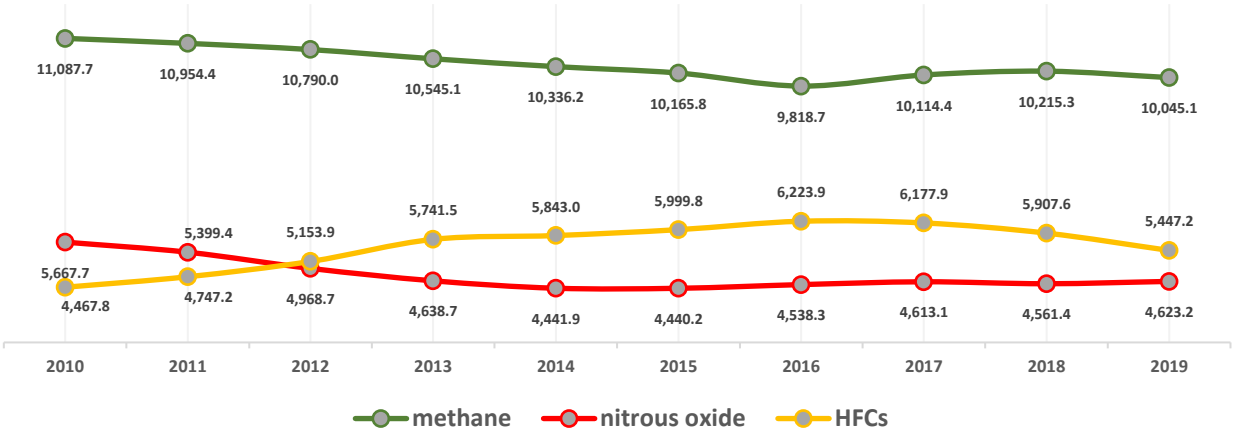
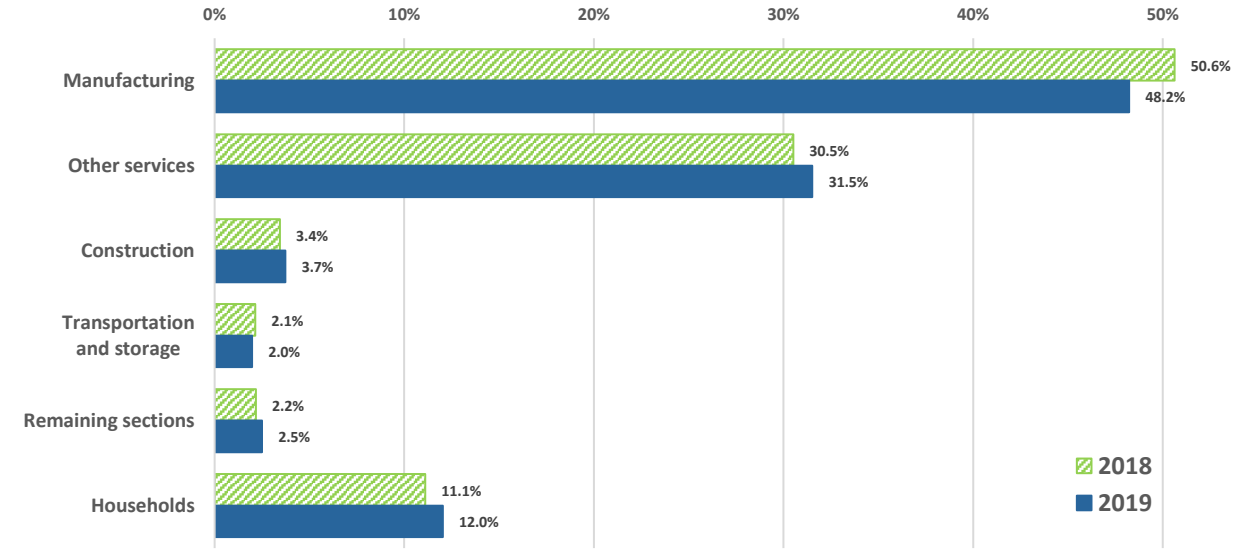
Graph 5. Total annual emissions (in 1,000 tonnes of CO_2 equivalent) of methane (CH_4), nitrous oxide (N_2O) and hydrofluorocarbons (HFCs), 2010 - 2019



Graph 6. Percentage distribution of hydrofluorocarbons (HFCs) emissions to main sections of the Statistical Classification of Economic Activities (NACE Rev.2) and Households, 2018* και 2019*



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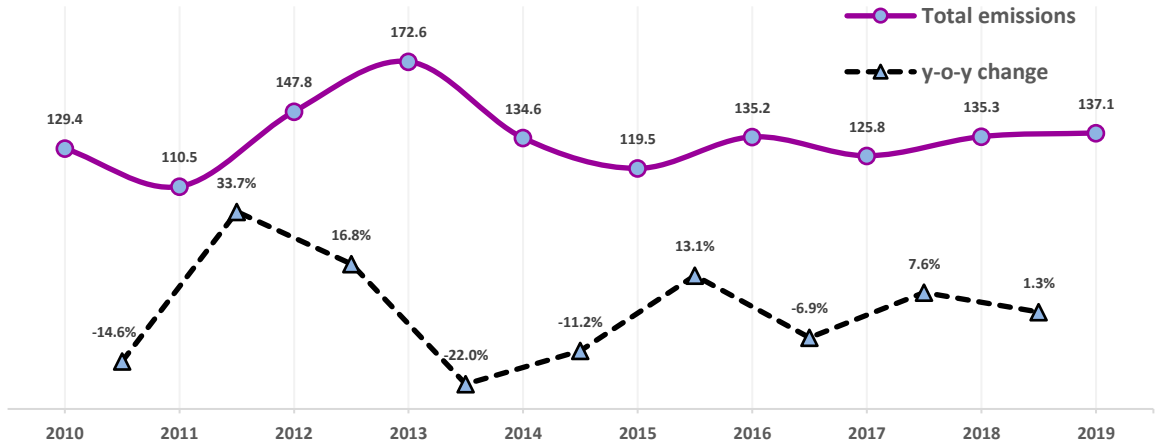
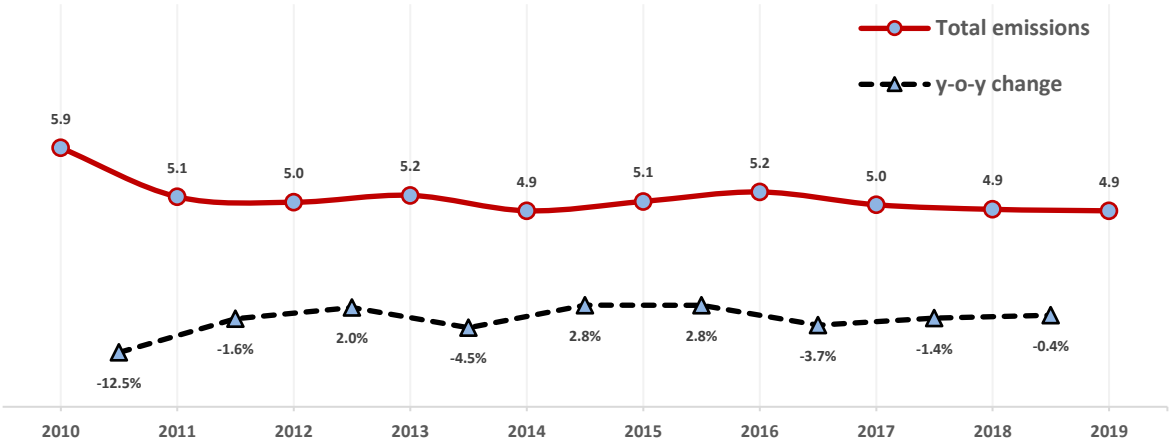
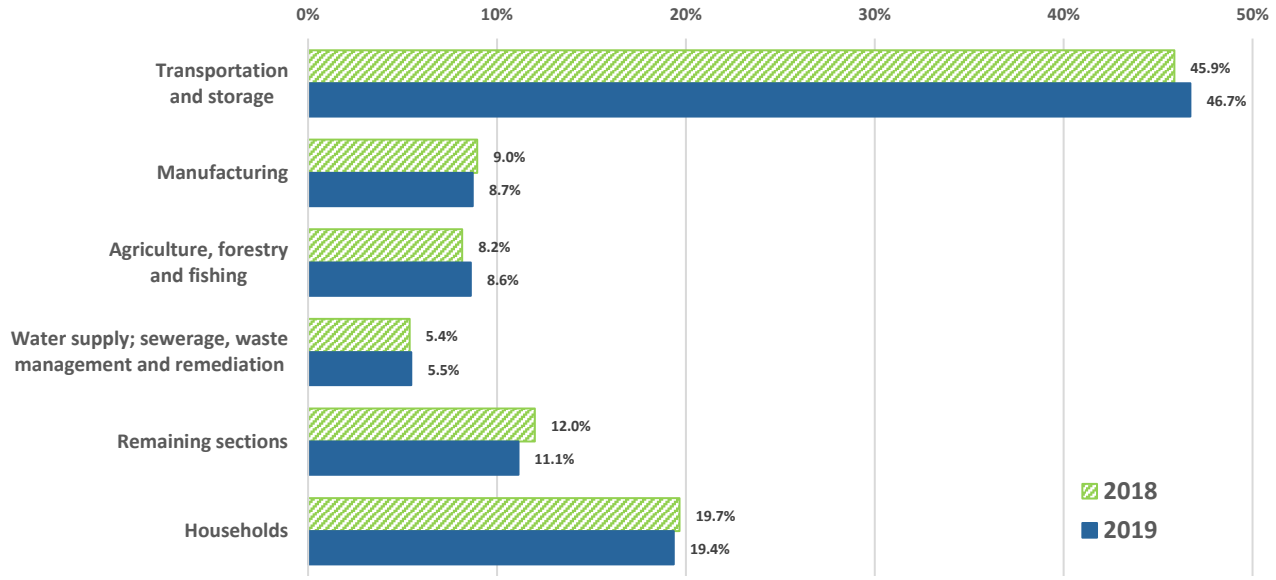
Graph 7: Total annual emissions (in 1,000 tonnes of CO_2 equivalent) and year-on-year change (%) of perfluorocarbons (PFCs) in "Manufacturing", 2010 - 2019



Graph 8: Total emissions (in 1,000 tonnes of CO_2 equivalent) and year-on-year change of sulfur hexafluoride (SF6) in "Electricity, gas, steam and air conditioning supply", 2010 - 2019



Graph 9. Percentage distribution of air pollutants' emissions to main sections of the Statistical Classification of Economic Activities (NACE Rev.2) and Households, 2018* και 2019*



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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 the 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 25 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 298 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 manufacturing.
4. **Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs)**: They are in the 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 source of these gases is manufacturing.
5. **Sulphur hexafluoride (SF_6)**: Sulphur 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. Sulphur 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 sulphur 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 in ELSTAT's portal (www.statistics.gr), at the following link:
http://www.statistics.gr/el/statistics/-/publication/SOP08/-