

ANNEXES TO THE NATIONAL INVENTORY REPORT

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Annexes to the national inventory report

Annex 1: Key categories

1.1. Description of methodology used for identifying key categories, if different from the Intergovernmental Panel on Climate Change (IPCC) tier 1 approach

Key categories according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006) are those found in the accumulative 95% (Tier 1) or 90% (Tier 2) of the total annual emissions in the last reported year or belonging to the total trend, when ranked from contributing the largest to smallest share in annual total and in the trend. As originally designed it applied only to source categories. Following the 2006 IPCC Guidelines, Croatia undertook a key category analysis using Tier 1 and Tier 2 Level and Trend methods.

1.1.1. Level assessment

Level assessment involves an identification of categories as a key by calculating the proportion of emissions and removals in each category to the total emissions and removals. The calculated values of proportion are added from the category that accounts for the largest proportion, until the sum reaches 95% for Tier 1, 90% for Tier 2. Tier 1 level assessment uses emissions and removals from each category directly and Tier 2 level assessment analyses the emissions and removals of each category, multiplied by the uncertainty (which is calculated in uncertainty analysis chapter) of each category.

1.1.2. Trend Assessment

The purpose of the trend assessment is to identify categories that may not be large enough to be identified by the level assessment, but whose trend is significantly different from the trend of the overall inventory and should therefore receive particular attention.

The difference between the rate of change in emissions and removals in a category and the rate of change in total emissions and removals is calculated. The trend assessment is calculated by multiplying this value by the ratio of contribution of the relevant category to total emissions and removals. The calculated results, regarded as trend assessment values, are added from the category of which the proportion to the total of trend assessment values is the largest, until the total reaches 95% for Tier 1, 90% for Tier 2. At this point, these categories are defined as the key categories. Tier 2 trend assessment is calculated multiplying the Tier 1 trend assessment with uncertainty of each category.

Table A1.1-1: Categories Assessed in Key Category Analysis

Source Categories Assessed in Key Source Category Analysis	Direct GHG
ENERGY	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O
1.A.3.a Domestic Aviation	CO ₂
1.A.3.a Domestic Aviation	CH ₄
1.A.3.a Domestic Aviation	N ₂ O
1.A.3.b Road Transportation	CO ₂
1.A.3.b Road Transportation	CH ₄
1.A.3.b Road Transportation	N ₂ O
1.A.3.c Railways	CO ₂
1.A.3.c Railways	CH ₄
1.A.3.c Railways	N ₂ O
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O
1.A.4 Other Sectors - Liquid Fuels	CO ₂
1.A.4 Other Sectors - Liquid Fuels	CH ₄
1.A.4 Other Sectors - Liquid Fuels	N ₂ O
1.A.4 Other Sectors - Solid Fuels	CO ₂
1.A.4 Other Sectors - Solid Fuels	CH ₄
1.A.4 Other Sectors - Solid Fuels	N ₂ O
1.A.4 Other Sectors - Gaseous Fuels	CO ₂
1.A.4 Other Sectors - Gaseous Fuels	CH ₄
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O
1.A.4 Other Sectors - Biomass	CH ₄

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.4 Other Sectors - Biomass	N ₂ O
1.B.1 Fugitive emissions from Solid Fuels	CH ₄
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄
1.B.2.c. Venting and flaring	CO ₂
1.B.2.c. Venting and flaring	CH ₄
1.B.2.c. Venting and flaring	N ₂ O
INDUSTRIAL PROCESSES AND PRODUCT USE	
2.A.1 Cement Production	CO ₂
2.A.2 Lime Production	CO ₂
2.A.3 Glass Production	CO ₂
2.A.4 Other Process Uses of Carbonates	CO ₂
2.B.1 Ammonia Production	CO ₂
2.B.1 Ammonia Production	CH ₄
2.B.1 Ammonia Production	N ₂ O
2.B.2 Nitric Acid Production	N ₂ O
2.B.8 Petrochemical and Carbon Black Production	CO ₂
2.B.8 Petrochemical and Carbon Black Production	CH ₄
2.C.1 Iron and Steel Production	CO ₂
2.C.2 Ferroalloys Production	CO ₂
2.C.2 Ferroalloys Production	CH ₄
2.C.3 Aluminium Production	CO ₂
2.C.3 Aluminium Production	PFCs
2.D Non-energy Products from Fuels and Solvent Use	CO ₂
2.F.1 Refrigeration and Air conditioning	F-gases
2.F.2 Foam blowing agents	F-gases
2.F.3 Fire Protection	F-gases
2.F.4 Aerosols	F-gases
2.G Other Product Manufacture and Use	N ₂ O
2.G Other Product Manufacture and Use	F-gases
AGRICULTURE	
3.A Enteric Fermentation	CH ₄
3.B Manure Management	CH ₄
3.B Manure Management	N ₂ O
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O

Source Categories Assessed in Key Source Category Analysis	Direct GHG
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O
3.G Liming	CO ₂
3.H Urea Application	CO ₂
LAND USE, LAND USE CHANGE AND FORESTRY	
4.A.1 Forest Land Remaining Forest Land	CO ₂
4.A.2 Land Converted to Forest Land	CO ₂
4.B.1 Cropland Remaining Cropland	CO ₂
4.B.2 Land Converted to Cropland	CO ₂
4.C.1 Grassland Remaining Grassland	CO ₂
4.C.2 Land Converted to Grassland	CO ₂
4.D.2 Land Converted to Wetlands	CO ₂
4.E.2 Land Converted to Settlements	CO ₂
4.G Harvested Wood Products	CO ₂
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O
4(V) Biomass Burning	CO ₂
4(V) Biomass Burning	CH ₄
4(V) Biomass Burning	N ₂ O
WASTE	
5.A Solid Waste Disposal	CH ₄
5.B Biological Treatment of Soild Waste	CH ₄
5.B Biological Treatment of Soild Waste	N ₂ O
5.C Incineration and Open Burning of Waste	CO ₂
5.C Incineration and Open Burning of Waste	N ₂ O
5.C Incineration and Open Burning of Waste	N ₂ O
5.C Incineration and Open Burning of Waste	CH ₄
5.D Wastewater Treatment and Discharge	CH ₄
5.D Wastewater Treatment and Discharge	N ₂ O

1.2. Information on the level of disaggregation

The level of disaggregation is in accordance with the suggested source categories split of the 2006 IPCC Guidelines and Uncertainty Management in National Greenhouse Gas Inventories and additionally.

Approach 1 and Approach 2 have been done in defining and calculating key categories.

1.3. Tables 4.2 and 4.3 of volume 1 of the 2006 IPCC Guidelines, including and excluding land use, land-use change and forestry

Table A1.3-1: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 1990

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.146	15%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.111	26%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.078	33%
3.A Enteric Fermentation	CH ₄	2,336.027	0.074	41%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	0.063	47%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.060	53%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.050	58%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.049	63%
2.C.3 Aluminium Production	PFCs	1,117.284	0.035	67%
2.A.1 Cement Production	CO ₂	1,086.203	0.034	70%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	0.030	73%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.024	75%
2.B.2 Nitric Acid Production	N ₂ O	670.739	0.021	77%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	0.021	80%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.019	81%
2.B.1 Ammonia Production	CO ₂	558.672	0.018	83%
5.A Solid Waste Disposal	CH ₄	558.576	0.018	85%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.017	87%
3.B Manure Management	CH ₄	491.908	0.016	88%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.013	90%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	0.011	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	0.010	92%
3.B Manure Management	N ₂ O	284.426	0.009	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	0.008	93%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.006	94%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	0.006	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.006	95%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.005	96%
2.A.2 Lime Production	CO ₂	156.820	0.005	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	0.005	97%
1.A.3.c Railways	CO ₂	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	0.004	97%
2.C.3 Aluminium Production	CO ₂	118.797	0.004	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	0.002	98%
1.A.3.b Road Transportation	N ₂ O	52.208	0.002	99%
3.H Urea Application	CO ₂	50.020	0.002	99%
1.A.3.b Road Transportation	CH ₄	46.028	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	0.001	100%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	0.001	100%
1.A.3.c Railways	N ₂ O	11.781	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	0.000	100%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO ₂	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	0.000	100%
TOTAL		31,546.320		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2022

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3.505.880	6.442.070	0.262	26%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1.880.045	2.267.413	0.092	35%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1.780.622	0.073	43%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1.668.428	0.068	50%
5.A Solid Waste Disposal	CH ₄	558.576	1.391.695	0.057	55%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1.267.266	0.052	60%
2.A.1 Cement Production	CO ₂	1.086.203	1.099.079	0.045	65%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2.450.506	1.048.466	0.043	69%
3.A Enteric Fermentation	CH ₄	2.336.027	1.020.852	0.042	73%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1.990.850	894.499	0.036	77%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1.575.900	814.708	0.033	80%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.028	83%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4.590.624	528.034	0.022	85%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.017	87%
3.B Manure Management	CH ₄	491.908	391.254	0.016	88%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.015	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1.536.292	327.149	0.013	91%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.013	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.011	94%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.009	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.006	95%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.005	96%
3.B Manure Management	N ₂ O	284.426	103.383	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.004	96%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.004	97%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.003	97%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.002	98%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.002	98%
1.A.3.c Railways	CO ₂	140.079	46.523	0.002	98%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.002	98%
3.H Urea Application	CO ₂	50.020	42.013	0.002	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	99%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	99%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
3.G Liming	CO ₂	0.000	18.695	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.001	100%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	100%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.000	100%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	100%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	100%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1.117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	100%
TOTAL		31.546.320	24.551.983		

Table A1.3-3: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 1990

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	0.167	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.118	28%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.090	38%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.063	44%
3.A Enteric Fermentation	CH ₄	2,336.027	0.060	50%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	0.051	55%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.048	60%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.041	64%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.040	68%
2.C.3 Aluminium Production	PFCs	1,117.284	0.029	71%
2.A.1 Cement Production	CO ₂	1,086.203	0.028	73%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	0.024	76%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.019	78%
2.B.2 Nitric Acid Production	N ₂ O	670.739	0.017	80%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	0.017	81%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.015	83%
2.B.1 Ammonia Production	CO ₂	558.672	0.014	84%
5.A Solid Waste Disposal	CH ₄	558.576	0.014	86%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.013	87%
3.B Manure Management	CH ₄	491.908	0.013	88%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.011	89%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	0.009	90%
4.G Harvested Wood Products	CO ₂	317.852	0.008	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	0.008	92%
3.B Manure Management	N ₂ O	284.426	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	0.006	93%
4.E.2 Land Converted to Settlements	CO ₂	235.440	0.006	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.005	94%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	0.005	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.004	96%
2.A.2 Lime Production	CO ₂	156.820	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	0.004	96%
1.A.3.c Railways	CO ₂	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	0.003	97%
2.C.3 Aluminium Production	CO ₂	118.797	0.003	97%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	0.002	98%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	0.002	98%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	0.002	98%
1.A.3.b Road Transportation	N ₂ O	52.208	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
1.A.3.b Road Transportation	CH ₄	46.028	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	0.001	99%
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	43.898	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	0.001	99%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	0.001	100%
4.B.2 Land Converted to Cropland	CO ₂	25.846	0.001	100%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	0.000	100%
4(V) Biomass Burning	CO ₂	14.979	0.000	100%
1.A.3.c Railways	N ₂ O	11.781	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.000	100%
4.C.2 Land Converted to Grassland	CO ₂	9.952	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	0.000	100%
4(V) Biomass Burning	CH ₄	1.378	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.000	100%
4(V) Biomass Burning	N ₂ O	0.763	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO ₂	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	0.000	100%
TOTAL		38,875.686		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2022

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.199	20%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	5,348.402	0.166	36%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.070	44%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.055	49%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.052	54%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.043	58%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.039	62%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.034	66%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.032	69%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.032	72%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.028	75%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.025	77%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.021	80%
4.E.2 Land Converted to Settlements	CO ₂	235.440	585.504	0.018	81%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.016	83%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.013	84%
4.G Harvested Wood Products	CO ₂	317.852	393.251	0.012	86%
3.B Manure Management	CH ₄	491.908	391.254	0.012	87%
4(V) Biomass Burning	CO ₂	14.979	382.039	0.012	88%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.011	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.010	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.010	91%
4.C.2 Land Converted to Grassland	CO ₂	9.952	304.428	0.009	92%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.009	93%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.655	0.008	94%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.007	94%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.005	95%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	148.525	0.005	95%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	138.671	0.004	96%
4.B.2 Land Converted to Cropland	CO ₂	25.846	119.946	0.004	96%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.003	96%
3.B Manure Management	N ₂ O	284.426	103.383	0.003	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.003	97%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.003	98%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.002	98%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.002	98%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.002	98%
1.A.3.c Railways	CO ₂	140.079	46.523	0.001	98%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.001	99%
3.H Urea Application	CO ₂	50.020	42.013	0.001	99%
4(V) Biomass Burning	CH ₄	1.378	37.147	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	99%
4(V) Biomass Burning	N ₂ O	0.763	21.225	0.001	99%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	99%
3.G Liming	CO ₂	0.000	18.695	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.000	100%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	12.448	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	100%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.000	100%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	100%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment	Cumulative Total (%)
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	100%
TOTAL		38,875.686	32,314.295		

Table A1.3-5: Key categories analysis – Trend Assessment - Tier 1 (Excluding LULUCF)

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.194	0.185	19%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.159	0.152	34%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.093	0.089	43%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.057	0.054	48%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.050	0.048	53%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.046	0.043	57%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.045	0.043	61%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.045	0.043	66%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.042	0.040	70%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.042	0.040	74%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.042	0.040	78%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.034	0.033	81%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.027	0.025	83%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.022	0.021	86%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.021	0.020	88%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.018	0.017	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.014	0.014	91%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.013	0.013	92%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.008	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.007	0.007	93%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.007	0.007	94%
3.B Manure Management	N ₂ O	284.426	103.383	0.006	0.006	95%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.005	0.005	95%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.005	0.005	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.005	0.004	96%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.004	0.004	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.004	0.003	97%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.003	0.003	97%
1.A.3.c Railways	CO ₂	140.079	46.523	0.003	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.003	0.003	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.003	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.002	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.001	0.001	98%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.001	0.001	98%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.001	0.001	98%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	0.001	99%

Tier 1 Analysis - Trend Assessment

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.001	0.001	99%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	0.001	99%
3.G Liming	CO ₂	0.000	18.695	0.001	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.001	0.001	99%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.001	0.001	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.001	0.000	99%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	0.000	99%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	0.000	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.000	0.000	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.000	0.000	100%
3.B Manure Management	CH ₄	491.908	391.254	0.000	0.000	100%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	0.000	100%
3.H Urea Application	CO ₂	50.020	42.013	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
TOTAL		31,546.320	24,551.983			

Table A1.3-6: Key categories analysis – Trend Assessment - Tier 1 (Including LULUCF)

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.131	0.156	16%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.122	0.145	30%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.066	0.079	38%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.039	0.046	43%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.037	0.044	47%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.035	0.042	51%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.035	0.041	55%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.035	0.041	59%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.034	0.041	64%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.029	0.034	67%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.028	0.034	70%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.026	0.031	73%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.020	0.024	76%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.018	0.022	78%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.016	0.019	80%
4.E.2 Land Converted to Settlements	CO ₂	235.440	585.504	0.015	0.017	82%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.014	0.017	83%
4(V) Biomass Burning	CO ₂	14.979	382.039	0.014	0.016	85%
4.C.2 Land Converted to Grassland	CO ₂	9.952	304.428	0.011	0.013	86%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.010	0.012	88%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.655	0.009	0.011	89%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.007	0.009	89%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.006	0.007	90%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.006	0.007	91%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.005	0.006	91%
3.B Manure Management	N ₂ O	284.426	103.383	0.005	0.006	92%
4.G Harvested Wood Products	CO ₂	317.852	393.251	0.005	0.006	93%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.005	0.006	93%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.004	0.005	94%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	148.525	0.004	0.005	94%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.004	0.004	95%
4.B.2 Land Converted to Cropland	CO ₂	25.846	119.946	0.004	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.004	0.004	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.003	0.003	96%
1.A.3.c Railways	CO ₂	140.079	46.523	0.003	0.003	96%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	138.671	0.002	0.003	96%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.002	0.003	97%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.002	0.002	97%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	12.448	0.002	0.002	97%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.002	0.002	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.002	0.002	98%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	5,348.402	0.001	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.001	0.002	98%
4(V) Biomass Burning	CH ₄	1.378	37.147	0.001	0.002	98%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.001	0.001	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.001	0.001	98%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.001	0.001	98%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.001	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.001	0.001	99%
4(V) Biomass Burning	N ₂ O	0.763	21.225	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	0.001	99%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	0.001	99%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.001	0.001	99%
3.G Liming	CO ₂	0.000	18.695	0.001	0.001	99%
3.B Manure Management	CH ₄	491.908	391.254	0.001	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.000	0.000	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.000	0.000	99%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	0.000	100%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	0.000	100%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.000	0.000	100%
3.H Urea Application	CO ₂	50.020	42.013	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
TOTAL		38,875.686	32,314.295			

Table A1.3-7: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 1990

Tier 2 Analysis - Level Assessment - Excluding LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
2.C.3 Aluminium Production	PFCs	1,117.284	0.149	15%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	0.136	29%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	0.111	40%
3.B Manure Management	N ₂ O	284.426	0.077	47%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.047	52%
2.A.1 Cement Production	CO ₂	1,086.203	0.037	56%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.037	59%
3.A Enteric Fermentation	CH ₄	2,336.027	0.035	63%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	0.029	66%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.028	69%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	0.026	71%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.020	73%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	0.020	75%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	0.018	77%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	0.016	79%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.016	80%
2.B.2 Nitric Acid Production	N ₂ O	670.739	0.015	82%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.015	83%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	0.014	85%
5.A Solid Waste Disposal	CH ₄	558.576	0.013	86%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	0.013	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.012	89%
1.A.3.b Road Transportation	N ₂ O	52.208	0.012	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.012	91%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	0.010	92%
3.B Manure Management	CH ₄	491.908	0.010	93%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	0.010	94%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.007	95%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.006	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.005	96%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.005	96%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.004	97%
1.A.3.c Railways	N ₂ O	11.781	0.003	97%
1.A.3.b Road Transportation	CH ₄	46.028	0.003	97%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	0.002	98%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.002	98%
2.B.1 Ammonia Production	CO ₂	558.672	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	0.001	98%
2.C.3 Aluminium Production	CO ₂	118.797	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.001	99%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	0.001	99%
1.A.3.c Railways	CO ₂	140.079	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	32.648	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	0.001	100%
2.A.2 Lime Production	CO ₂	156.820	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.3.c Railways	CH ₄	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO ₂	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	0.000	100%
TOTAL		31,546.320		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2022

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.156	16%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.124	28%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.108	39%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.082	47%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.066	53%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.055	59%
3.B Manure Management	N ₂ O	284.426	103.383	0.055	64%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.031	68%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.028	70%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.026	73%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.026	76%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.023	78%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.021	80%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.018	82%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.018	84%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.017	85%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.015	87%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.013	88%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.011	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.011	90%
3.B Manure Management	CH ₄	491.908	391.254	0.010	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.010	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.009	93%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.007	94%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.005	94%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.005	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.005	95%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.005	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.003	97%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	19.335	0.003	97%
3.G Liming	CO ₂	0.000	18.695	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.002	98%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.002	98%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.002	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.002	99%
3.H Urea Application	CO ₂	50.020	42.013	0.001	99%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.001	99%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.001	99%
1.A.3.c Railways	CO ₂	140.079	46.523	0.001	99%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	100%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	100%
TOTAL		31,546.320	24,551.983		

Table A1.3-9: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 1990

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	0.399	40%
2.C.3 Aluminium Production	PFCs	1,117.284	0.074	47%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	0.068	54%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	0.055	60%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	0.046	64%
3.B Manure Management	N ₂ O	284.426	0.039	68%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.023	70%
4.E.2 Land Converted to Settlements	CO ₂	235.440	0.019	72%
2.A.1 Cement Production	CO ₂	1,086.203	0.018	74%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.018	76%
3.A Enteric Fermentation	CH ₄	2,336.027	0.018	78%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	0.016	79%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	0.014	81%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.014	82%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	0.013	83%
4.G Harvested Wood Products	CO ₂	317.852	0.013	85%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.010	86%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	0.010	87%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	0.009	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	0.008	88%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.008	89%
2.B.2 Nitric Acid Production	N ₂ O	670.739	0.008	90%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.008	91%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	0.007	91%
5.A Solid Waste Disposal	CH ₄	558.576	0.007	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	0.007	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.006	93%
1.A.3.b Road Transportation	N ₂ O	52.208	0.006	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.006	95%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	0.005	95%
3.B Manure Management	CH ₄	491.908	0.005	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	0.005	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.004	96%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	0.003	97%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.003	97%
4.B.2 Land Converted to Cropland	CO ₂	25.846	0.003	97%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.003	98%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.002	98%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	0.002	98%
1.A.3.c Railways	N ₂ O	11.781	0.001	98%
1.A.3.b Road Transportation	CH ₄	46.028	0.001	98%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	0.001	99%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.001	99%
4.C.2 Land Converted to Grassland	CO ₂	9.952	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	0.001	99%
2.C.3 Aluminium Production	CO ₂	118.797	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.001	99%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	0.001	99%
1.A.3.c Railways	CO ₂	140.079	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	0.000	100%
2.G Other Product Manufacture and Use	N ₂ O	32.648	0.000	100%
4(V) Biomass Burning	CO ₂	14.979	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.000	100%
4(V) Biomass Burning	CH ₄	1.378	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	100%
4(V) Biomass Burning	N ₂ O	0.763	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO ₂	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO ₂	0.000	0.000	100%
TOTAL		38,875.686		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2022

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	5,348.402	0.418	42%
4.E.2 Land Converted to Settlements	CO ₂	235.440	585.504	0.072	49%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.053	54%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	138.671	0.045	59%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.042	63%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.036	67%
4.C.2 Land Converted to Grassland	CO ₂	9.952	304.428	0.034	70%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.028	73%
4.B.2 Land Converted to Cropland	CO ₂	25.846	119.946	0.026	75%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.022	77%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.655	0.021	80%
4.G Harvested Wood Products	CO ₂	317.852	393.251	0.019	82%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.019	83%
3.B Manure Management	N ₂ O	284.426	103.383	0.018	85%
4(V) Biomass Burning	CO ₂	14.979	382.039	0.015	87%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.011	88%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.010	89%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.009	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.009	91%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	148.525	0.008	91%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.008	92%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.007	93%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.006	93%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.006	94%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.006	95%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.005	95%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.004	96%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.004	96%
3.B Manure Management	CH ₄	491.908	391.254	0.004	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.003	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.002	97%
4(V) Biomass Burning	CH ₄	1.378	37.147	0.002	98%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.002	98%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.002	98%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.002	98%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	12.448	0.001	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.001	99%
4(V) Biomass Burning	N ₂ O	0.763	21.225	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.001	99%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	99%
3.G Liming	CO ₂	0.000	18.695	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.001	99%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.001	99%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.001	100%
3.H Urea Application	CO ₂	50.020	42.013	0.001	100%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	100%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	100%
1.A.3.c Railways	CO ₂	140.079	46.523	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	100%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Level Assessment Tier 2	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	100%
TOTAL		38,875.686	32,314.295		

Table A1.3-11: Key categories analysis – Trend Assessment - Tier 2 (Excluding LULUCF)

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.093	0.203	20%
3.B Manure Management	N ₂ O	284.426	103.383	0.006	0.118	32%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.194	0.089	41%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.050	0.085	49%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.159	0.071	57%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.007	0.041	61%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.001	0.029	64%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.003	0.028	66%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.042	0.027	69%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.057	0.025	71%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.045	0.020	74%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.045	0.020	76%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.042	0.019	77%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.042	0.019	79%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.034	0.015	81%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.004	0.014	82%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.005	0.012	83%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.005	0.011	84%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.002	0.010	85%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.001	0.010	86%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.001	0.010	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.022	0.009	88%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.021	0.009	89%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.004	0.008	90%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.001	0.007	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.014	0.006	92%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.000	0.006	92%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	0.005	93%
3.G Liming	CO ₂	0.000	18.695	0.001	0.005	93%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.001	0.005	94%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.027	0.005	94%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.001	0.004	94%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.000	0.004	95%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	0.004	95%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	0.003	96%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.018	0.003	96%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	0.003	96%

Tier 2 Analysis - Trend Assessment Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	0.003	97%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	0.003	97%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	0.003	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.000	0.003	97%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	0.002	98%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.013	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.001	0.002	99%
1.A.3.c Railways	CO ₂	140.079	46.523	0.003	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.003	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	0.001	99%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	0.001	99%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.001	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	0.000	100%
3.B Manure Management	CH ₄	491.908	391.254	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.001	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	0.000	100%
3.H Urea Application	CO ₂	50.020	42.013	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.001	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.003	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.008	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.007	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.005	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.046	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	0.000	100%
TOTAL		31,546.320	24,551.983			

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF)

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
4.E.2 Land Converted to Settlements	CO ₂	235.440	585.504	0.015	0.127	13%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,780.622	0.066	0.097	22%
4.C.2 Land Converted to Grassland	CO ₂	9.952	304.428	0.011	0.087	31%
3.B Manure Management	N ₂ O	284.426	103.383	0.005	0.064	38%
4.B.2 Land Converted to Cropland	CO ₂	25.846	119.946	0.004	0.057	43%
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	138.671	0.002	0.056	49%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.655	0.009	0.052	54%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	0.131	0.040	58%
5.A Solid Waste Disposal	CH ₄	558.576	1,391.695	0.035	0.039	62%
4(V) Biomass Burning	CO ₂	14.979	382.039	0.014	0.038	66%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	0.122	0.037	69%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	952.297	677.569	0.004	0.024	72%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	309.660	214.143	0.002	0.023	74%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963	0.006	0.021	76%
4.G Harvested Wood Products	CO ₂	317.852	393.251	0.005	0.017	78%
4.D.2 Land Converted to Wetlands	CO ₂	77.232	12.448	0.002	0.016	80%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	148.525	0.004	0.016	81%
3.A Enteric Fermentation	CH ₄	2,336.027	1,020.852	0.034	0.015	83%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	0.039	0.012	84%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	0.037	0.011	85%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	0.035	0.010	86%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	0.029	0.009	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	0.028	0.009	88%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	5,348.402	0.001	0.008	88%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	0.026	0.008	89%
5.D Wastewater Treatment and Discharge	CH ₄	659.515	419.354	0.005	0.007	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	155.067	100.266	0.001	0.007	91%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181	0.004	0.006	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	0.018	0.005	92%
4(V) Biomass Burning	CH ₄	1.378	37.147	0.001	0.005	92%
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	0.002	0.005	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910	0.001	0.005	93%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	0.016	0.005	94%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	14.202	0.001	0.005	94%
5.D Wastewater Treatment and Discharge	N ₂ O	59.478	88.788	0.001	0.005	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089	0.003	0.004	95%
4(V) Biomass Burning	N ₂ O	0.763	21.225	0.001	0.003	96%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	276.705	0.010	0.003	96%
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	0.000	0.003	96%
5.B Biological Treatment of Soild Waste	CH ₄	0.000	19.335	0.001	0.003	96%
2.G Other Product Manufacture and Use	N ₂ O	32.648	16.938	0.000	0.002	97%
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	0.001	0.002	97%
3.G Liming	CO ₂	0.000	18.695	0.001	0.002	97%
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	0.020	0.002	97%
1.A.3.b Road Transportation	CH ₄	46.028	8.187	0.001	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	0.000	0.002	98%
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	0.000	0.002	98%
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937	0.000	0.002	98%
2.B.1 Ammonia Production	CO ₂	558.672	83.899	0.014	0.002	98%
1.A.3.c Railways	N ₂ O	11.781	4.758	0.000	0.002	98%
5.B Biological Treatment of Soild Waste	N ₂ O	0.000	8.887	0.000	0.002	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	16.267	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	11.280	0.000	0.001	99%
2.A.1 Cement Production	CO ₂	1,086.203	1,099.079	0.007	0.001	99%
1.A.3.c Railways	CO ₂	140.079	46.523	0.003	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	2.051	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	0.000	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	0.000	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	0.000	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	0.002	0.000	100%
3.B Manure Management	CH ₄	491.908	391.254	0.001	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.611	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	0.000	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	0.000	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	0.001	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.555	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	1.625	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (ktCO ₂ -eq)	Last Year (2022) Estimate (ktCO ₂ -eq)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	111.292	0.001	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.660	0.028	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.560	0.119	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	30.430	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	11.322	14.671	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	0.000	0.000	100%
3.H Urea Application	CO ₂	50.020	42.013	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.195	0.058	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802	0.000	0.002	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.006	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.005	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	4.366	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.004	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.035	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.000	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297	0.000	0.000	100%
TOTAL		38,875.686	32,314.295			

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2024, 1990)

Tier 1 and Tier 2 Analysis - Key Source Analysis Summary (Croatian Inventory, year 1990)					
A	B	C	D		E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification		Com.
1. Energy					
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	Yes	L1e, L2e	L1i	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	Yes	L1e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	Yes	L1e, L2e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	Yes	L1e	L1i	
1.A.3.b Road Transportation	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.3.b Road Transportation	N ₂ O	Yes	L2e		
1.A.4 Other Sectors - Biomass	CH ₄	Yes	L1e, L2e	L1i, L2i	
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	Yes	L1e	L1i	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	Yes	L2e	L2i	
1.A.4 Other Sectors - Solid Fuels	CO ₂	Yes	L1e	L1i	
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	Yes	L2e	L2i	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	Yes	L1e, L2e	L1i, L2i	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	Yes	L2e		
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	Yes	L1e, L2e	L1i, L2i	
2. Industrial processes and product use					
2.A.1 Cement Production	CO ₂	Yes	L1e, L2e	L1i, L2i	
2.B.1 Ammonia Production	CO ₂	Yes	L1e	L1i	
2.B.2 Nitric Acid Production	N ₂ O	Yes	L1e, L2e	L1i, L2i	
2.B.8 Petrochemical and Carbon Black Production	CO ₂	Yes	L1e	L1i	
2.C.2. Ferroalloys Production	CO ₂	Yes		L1i	
2.C.3 Aluminium Production	PFCs	Yes	L1e, L2e	L1i, L2i	
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	Yes	L1e	L1i	
3. Agriculture					
3.A Enteric Fermentation	CH ₄	Yes	L1e, L2e	L1i, L2i	
3.B Manure Management	CH ₄	Yes	L1e	L1i	
3.B Manure Management	N ₂ O	Yes	L1e, L2e	L1i, L2i	
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e	L1i, L2i	
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e	L1i, L2i	
4. Land use, land use change and forestry					
4.A.1 Forest Land Remaining Forest Land	CO ₂	Yes		L1i, L2i	
4.B.1 Cropland Remaining Cropland	CO ₂	Yes		L2i	
4.D.2 Land Converted to Wetlands	CO ₂	Yes		L2i	
4.E.2 Land Converted to Settlements	CO ₂	Yes		L1i, L2i	
4.G Harvested Wood Products	CO ₂	Yes		L1i, L2i	
5. Waste					
5.A Solid Waste Disposal	CH ₄	Yes	L1e, L2e	L1i	
5.D Wastewater Treatment and Discharge	CH ₄	Yes	L1e, L2e	L1i, L2i	
5.D Wastewater Treatment and Discharge	N ₂ O	Yes	L2e		

L1e - Level excluding LULUCF Tier 1 L2e - Level excluding LULUCF Tier 2

L1i - Level including LULUCF Tier 1 L2i - Level including LULUCF Tier 2

Table A1.3-14: Source Analysis Summary (Croatian Inventory NIR 2024, year t=2022)

Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year = 2022)									
A	B	C	D						E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification						Com.
1. Energy									
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i			
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	Yes	L1e	T1e T2e	L1i	T1i T2i			
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	Yes	L1e L2e	T1e T2e	L1i	T1i T2i			
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	Yes		T2e					
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	Yes	L1e	T1e T2e	L1i	T1i			
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e L2e	T1e T2e	L1i	T1i T2i			
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	Yes	L1e	T1e	L1i	T1i			
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	Yes	L1e	T1e T2e	L1i	T1i T2i			
1.A.3.b Road Transportation	CO ₂	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i			
1.A.3.b Road Transportation	N ₂ O	Yes	L2e						
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	Yes	L1e						
1.A.4 Other Sectors – Biomass	CH ₄	Yes	L1e L2e	T2e	L1i L2i				
1.A.4 Other Sectors – Biomass	N ₂ O	Yes	L2e						
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	Yes	L1e L2e	T1e T2e	L1i	T1i T2i			
1.A.4 Other Sectors - Liquid Fuels	CO ₂	Yes	L1e L2e	T1e T2e	L1i	T1i T2i			
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	Yes	L2e						
1.A.4 Other Sectors - Solid Fuels	CO ₂	Yes		T1e T2e		T1i			
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	Yes		T2e					
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	Yes		T1e T2e		T1i T2i			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	Yes	L2e	T2e					
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	Yes	L1e L2e		L1i L2i				
2. Industrial processes and product use									
2.A.1 Cement Production	CO ₂	Yes	L1e	T1e	L1i	T1i			
2.B.1 Ammonia Production	CO ₂	Yes		T1e		T1i			
2.B.2 Nitric Acid Production	N ₂ O	Yes		T1e		T1i			
2.B.8 Petrochemical and Carbon Black Production	CO ₂	Yes		T1e		T1i			
2.C.2 Ferroalloys Production	CO ₂	Yes		T1e		T1i			
2.C.3 Aluminium Production	CO ₂	Yes				T1i			
2.C.3 Aluminium Production	PFCs	Yes		T1e		T1i			
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	Yes		T2e					
2.F.1 Refrigeration and Air conditioning	F-gases	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i			
3. Agriculture									
3.A Enteric Fermentation	CH ₄	Yes	L1e L2e	T1e T2e	L1i	T1i T2i			
3.B Manure Management	CH ₄	Yes	L1e, L2e		L1i				
3.B Manure Management	N ₂ O	Yes		T1e T2e	L2i	T1i T2i			
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	Yes	L1e L2e	T2e	L1i L2i	T1i T2i			
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	Yes	L1e L2e	T2e	L1i L2i	T2i			
4. Land use land use change and forestry									
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	Yes			L1i	T1i T2i			
4(V) Biomass Burning	CO ₂	Yes			L1i L2i	T1i T2i			
4.A.1 Forest Land Remaining Forest Land	CO ₂	Yes			L1i L2i	T2i			
4.A.2 Land Converted to Forest Land	CO ₂	Yes			L1i L2i	T1i T2i			
4.B.1 Cropland Remaining Cropland	CO ₂	Yes			L2i	T2i			
4.B.2 Land Converted to Cropland	CO ₂	Yes			L2i	T1i T2i			
4.C.2 Land Converted to Grassland	CO ₂	Yes			L1i L2i	T1i T2i			
4.D.2 Land Converted to Wetlands	CO ₂	Yes				T2i			
4.E.2 Land Converted to Settlements	CO ₂	Yes			L1i L2i	T1i T2i			
4.G Harvested Wood Products	CO ₂	Yes			L1i L2i	T1i T2i			
5. Waste									
5.A Solid Waste Disposal	CH ₄	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i			
5.D Wastewater Treatment and Discharge	CH ₄	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i			
5.D Wastewater Treatment and Discharge	N ₂ O	Yes	L2e	T2e					

L1e - Level excluding LULUCF – Tier 1
 L2e - Level excluding LULUCF – Tier 2
 L1i - Level including LULUCF – Tier 1
 L2i - Level including LULUCF – Tier 2
 T1e - Trend excluding LULUCF – Tier 1
 T2e - Trend excluding LULUCF – Tier 2
 T1i - Trend including LULUCF – Tier 1
 T2i - Trend including LULUCF – Tier 2

Annex 2: Assessment of uncertainty

Annex 2: Assessment of uncertainty

2.1. Description of methodology used for identifying uncertainties

Uncertainty estimates are calculated using Approach 2 (Monte Carlo simulation). Approach 2 follows definition from the IPCC's General Guidance and Reporting: 2006 IPCC Guidelines for National Greenhouse gas Inventories (2006 Guidelines).

The Monte Carlo method was reviewed and revised in this submission, taking into account guidance from the 2006 Good Practice Guidance (IPCC, 2006). It will be discussed later in the chapter.

Uncertainty analysis using Approach 2 was calculated for every source. For LULUCF categories and subcategories the analysis was performed in the way of uncertainty determination of all input data and variables; which implies the determination of appropriate distribution for every input parameter needed for calculation of emission factors (EF) and for activity data (AD, areas). For categories of other sectors PDFs were defined for ADs and EFs, respectively. Monte Carlo simulation was applied afterwards. Results can be found in Table 3.3 according to IPCC 2006 Guidelines.

Uncertainty estimates were calculated in Excel spreadsheet application. Data have been divided into five sectors according to modus how the inventory work is organized (Energy, Industrial Processes and Other Product Use, Agriculture, Land Use, Land-Use Change and Forestry and Waste).

Every sector has been divided into sources. Each source was evaluated regarding uncertainties (%) on activity data (AD), emission factors (EF) or direct emissions (EM).

2.2. Estimation of Uncertainty by Monte Carlo Simulation (Approach 2)

2.2.1. Overview of the method

The Monte Carlo analysis is suitable for detailed category-by-category assessment of uncertainty, particularly where uncertainties are large, distribution is non-normal, distribution functions are complex and/or there are correlations between some of the activity sets, emissions factors, or both.

The principle of Monte Carlo analysis is to select random values of emission factor, activity data and other estimation parameters from within their individual probability density functions, and to calculate the corresponding emission values.

This procedure is repeated many times, using a computer, and the results of each calculation run build up the overall emission probability density function.

Monte Carlo analysis can be performed at the category level, for aggregations of categories or for the inventory as a whole.

Detailed procedure:

- A probability distribution function (PDF) was allocated to each emission factor and activity data. The PDFs were mostly normal, log-normal or triangle. The parameters of the PDFs were set by analysing the available data on emission factors and activity data or by expert judgement.
- If there was a lack of data for some emission source, associated uncertainties were extracted from the IPCC guidelines which imply that default uncertainty parameters were set.
- Using the software tool @RISK 5.7, each PDF was sampled 10,000 times and the emission calculations performed to produce a converged output distribution.
- The uncertainty in the trend between 1990 and the latest reported year, according to gas, was also estimated.

2.2.2. Uncertainty distributions and correlations for activity data and emission factors

Distributions

All of the input parameters in inventory are modelled using normal (95%), log-normal and triangle (some inputs in LULUCF) distributions.

Correlations

The Monte Carlo model contains a number of correlations. Omitting these correlations would lead to the uncertainties being underestimated. The trend uncertainty in the Monte Carlo model is particularly sensitive to some correlations.

Activity data and emission factor uncertainty

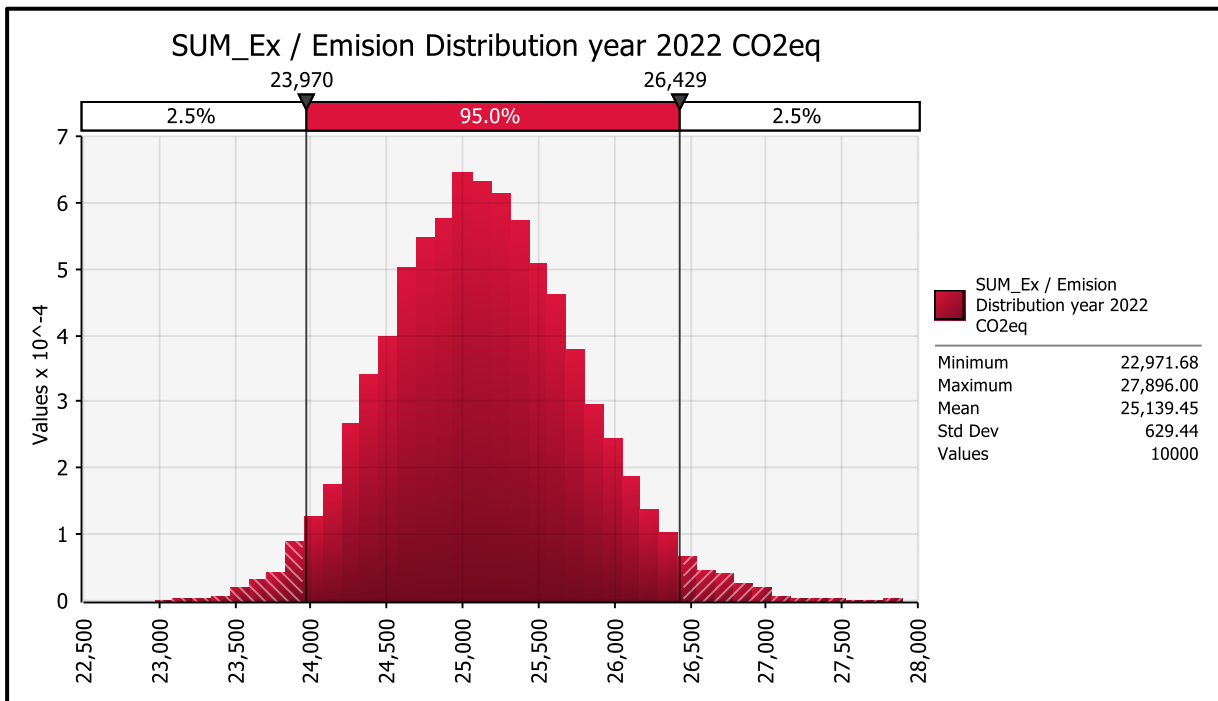
If for activity data or emission factor uncertainty default value from IPCC guidance was used, average value from range of given uncertainty was set.

2.2.3. Uncertainty excluding LULUCF sector

2.2.3.1. Uncertainty in the emissions excluding LULUCF

The estimations of CO₂-eq emissions were 24,551.89 kt CO₂-eq for the year 2022 and 31,546.32 kt CO₂-eq for the year 1990 without removals from LULUCF.

Figure A2.2-1: Distribution of the total CO₂ emissions for year 2022 excluding LULUCF



Monte Carlo analysis shows that with a certainty of 95% total emissions of all categories for the year 2022 (25,139.45 kt CO₂-eq) according to simulation varies between 23,970 kt CO₂-eq (2.5 percentile) and 26,429 kt CO₂-eq (97.5 percentile). Figure A2.2-1 shows the distribution of total CO₂ emission for year 2022.

Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories excluding LULUCF for the year 1990 (32,571.76 kt CO₂-eq) varies between 30,832 kt CO₂eq (2.5 percentile) and 34,516 kt CO₂eq (97.5 percentile).

Figure A2.2-2: Distribution of total CO₂ emission for year 1990 excluding LULUCF

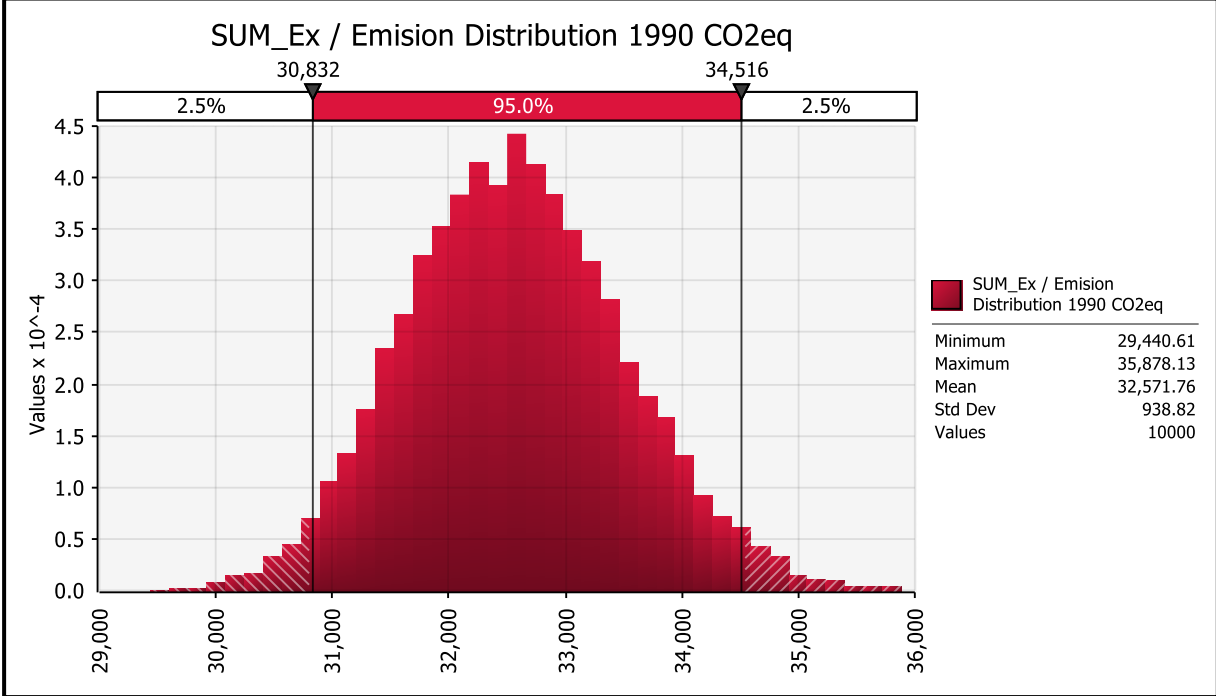


Figure A2.2-2 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2.3.2. Uncertainty in the trend excluding LULUCF

The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following formula:

$$MeanTrend (\%) = \left(\frac{Year\ emissions - Base\ year\ emissions}{Base\ year\ emissions} \right) \cdot 100 .$$

The Inventory trend excluding LULUCF is -22.17%, simulated trend is -22.76 % and the 95% probability range of the trend is -28.28% (2.5 percentile) to -16.76% (97.5 percentile).

Figure A2.2-3: Distribution of trend for year 2022 with the respect to year 1990

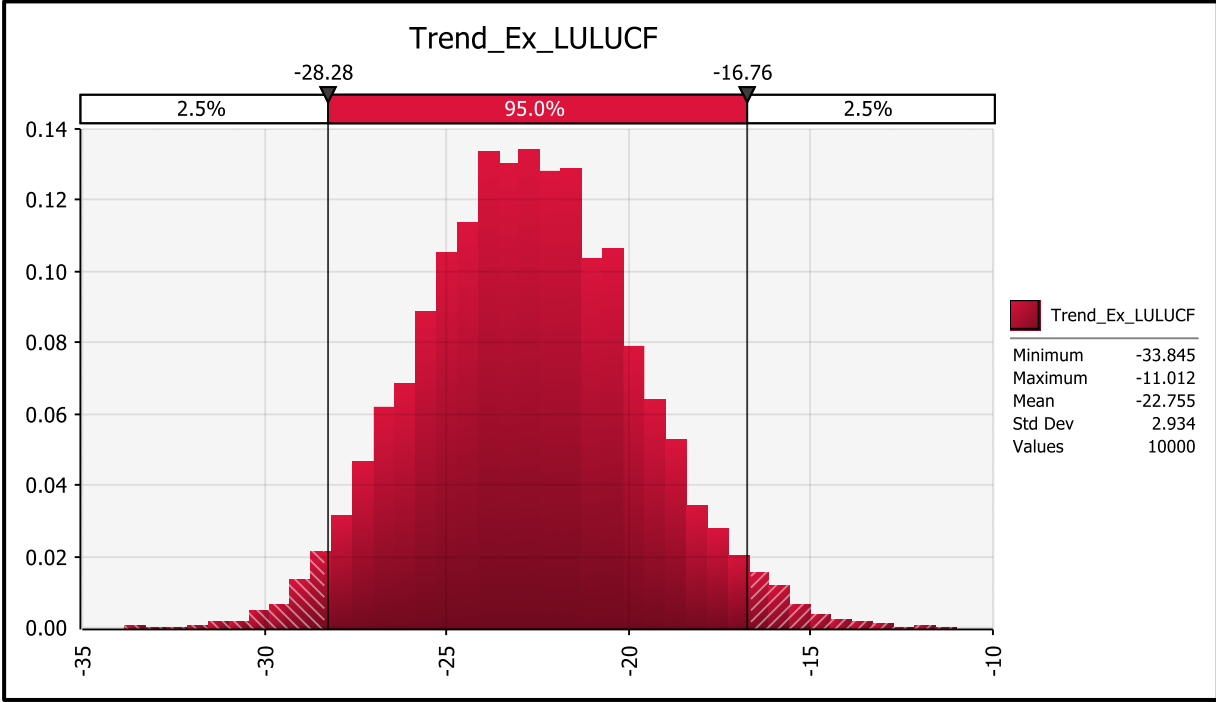


Figure A2.2-3: shows the distribution of trend for year 2022 respect to year 1990.

2.2.4. Uncertainty including LULUCF sector

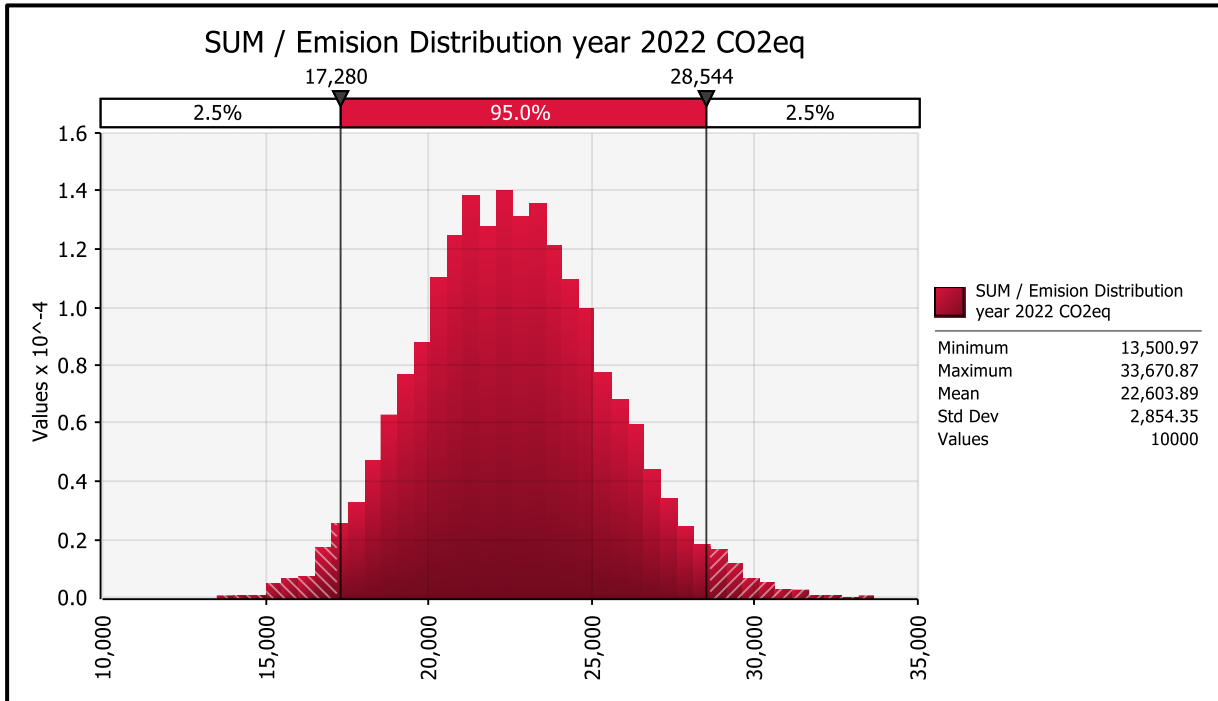
2.2.4.1. Uncertainty in the emissions including LULUCF

The estimations of CO₂-eq emissions were 19,684.82 kt CO₂-eq for the year 2022, and 25,198.28 kt CO₂-eq for the year 1990.

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2021 (22,603.89 kt CO₂eq) according to simulation varies between 17,280 kt CO₂eq (2.5 percentile) and 28,544 kt CO₂eq (97.5 percentile).

Figure A2.2-4 shows the distribution of total CO₂ emission including LULUCF for year 2022 with a corresponding probability density function (red line) that best matches the simulation results.

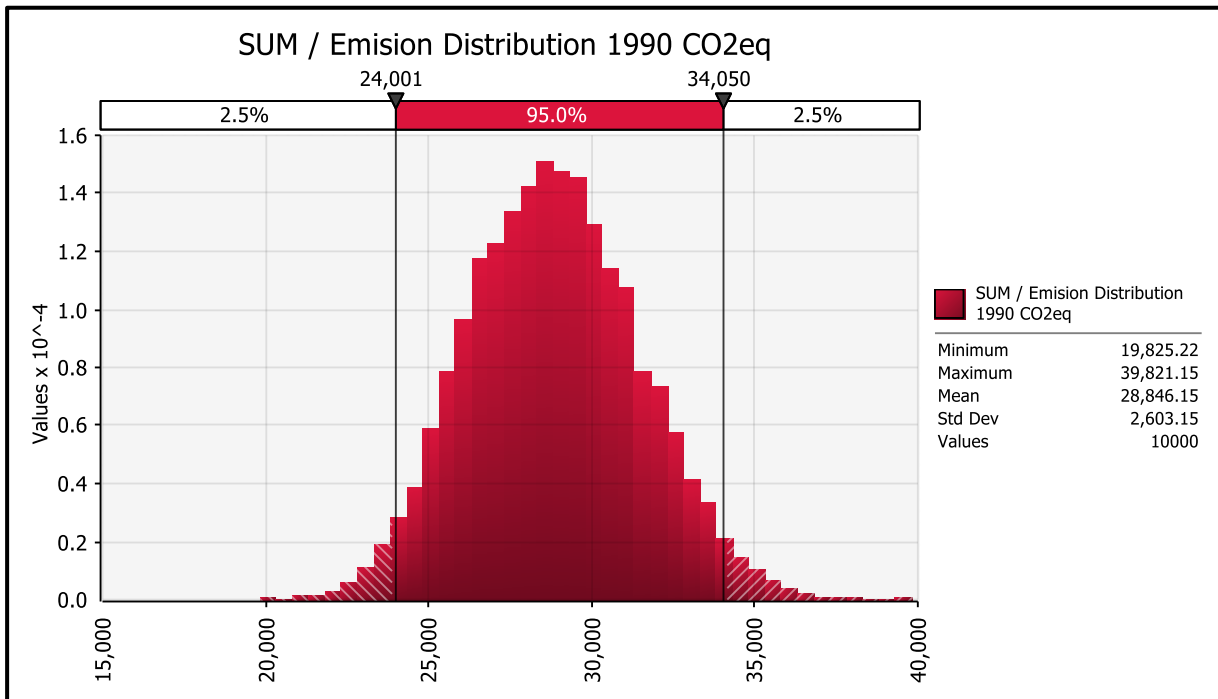
Figure A2.2-4: Distribution of total CO₂ emission for year 2022 including LULUCF



Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (28,846.15 kt CO₂eq) varies between 24,001 kt CO₂-eq (2.5 percentile) and 34,050 kt CO₂eq (97.5 percentile).

Figure A2.2-5 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

Figure A2.2-5: Distribution of total CO₂ emission for year 1990 including LULUCF



2.2.4.2. Uncertainty in the trend including LULUCF

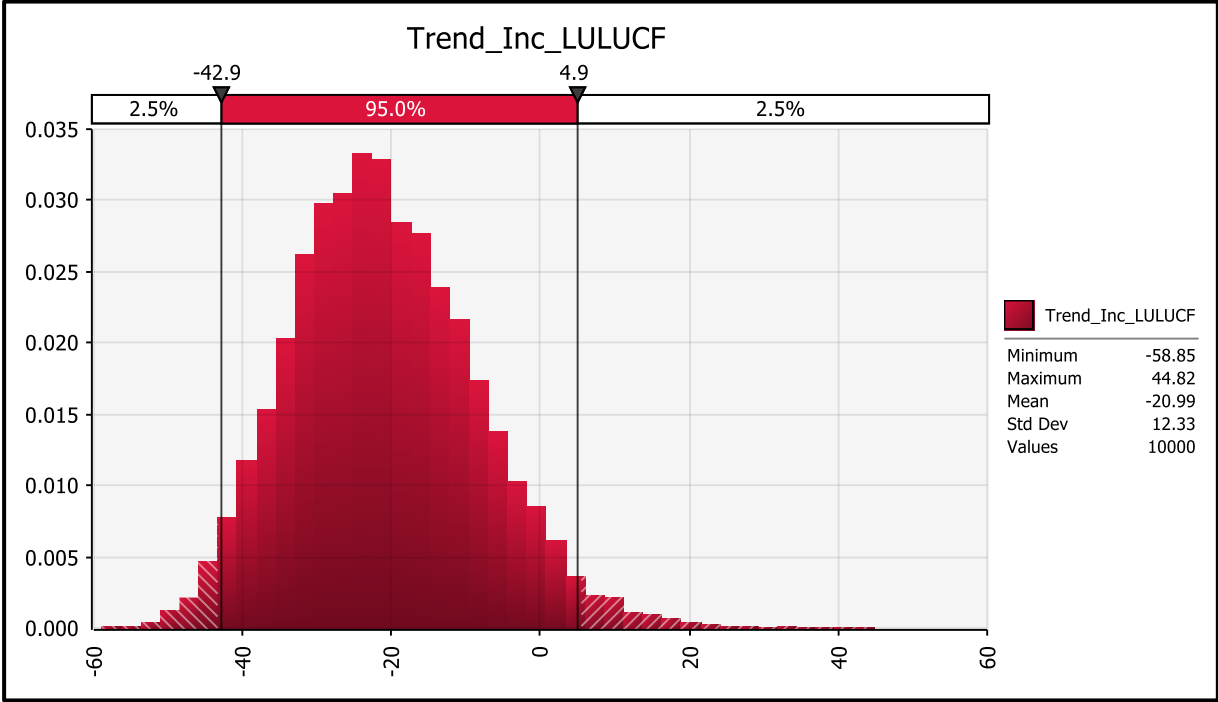
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following formula:

$$Mean Trend (\%) = \left(\frac{Year\ t\ emissions - Base\ year\ emissions}{Base\ year\ emissions} \right) \cdot 100 .$$

The Inventory trend including LULUCF is -21.88%, simulated trend is -20.99% and the 95% probability range of the trend is -42.9% (2.5 percentile) to 4.9% (97.5 percentile).

Figure A2.2-6: shows the distribution of trend for year 2022 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results, including LULUCF.

Figure A2.2-6: Distribution of trend for year 2022 with the respect to year 1990 including LULUCF



2.3. Table 3.3 of Volume 1 of the 2006 IPCC Guidelines

Table A2:3-1: Uncertainty estimates from the Monte Carlo simulation for the year t=2022 (IPCC 2006 Table 3.3)

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	528.034	-5	5	-5	5	-6.98	7.14	0.000043	-88.50	-1.10	1.23	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	4.139	0.393	-5	5	-50	50	-49.63	50.81	0.000000	-90.49	-5.14	11.45	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	7.839	0.856	-5	5	-200	200	-92.02	209.45	0.000000	-89.08	-10.30	154.69	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,267.266	-5	5	-5	5	-6.96	7.07	0.000250	112.94	-20.34	22.34	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.179	0.382	-5	5	-50	50	-49.76	49.54	0.000000	113.93	-116.61	272.52	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.535	5.424	-5	5	-200	200	-91.81	211.97	0.000002	113.93	-201.23	3561.39	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	2,267.413	-5	5	-5	5	-6.94	7.22	0.000794	20.60	-11.22	12.79	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.762	2.449	-5	5	-50	50	-49.79	50.18	0.000000	38.99	-74.94	174.86	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.102	8.543	-5	5	-200	200	-92.27	214.20	0.000006	67.44	-157.15	2656.09	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄		11.280	-5	5	-50	50	-50.45	50.56	0.000001				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O		14.202	-5	5	-200	200	-91.44	208.78	0.000016				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	1,990.850	894.499	-5	5	-5	5	-6.98	7.06	0.000125	-55.07	-4.18	4.73	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.156	0.904	-5	5	-50	50	-49.68	50.62	0.000000	-58.08	-23.10	51.69	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.060	1.700	-5	5	-200	200	-91.25	213.09	0.000000	-58.14	-39.07	553.62	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	327.149	-5	5	-5	5	-6.98	7.31	0.000017	-78.71	-2.02	2.25	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.263	0.931	-5	5	-50	50	-50.12	51.42	0.000000	-78.15	-11.99	25.85	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.052	1.322	-5	5	-200	200	-91.29	208.49	0.000000	-78.15	-20.42	314.90	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	814.708	-5	5	-5	5	-6.94	7.21	0.000103	-48.30	-4.99	5.47	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.787	0.407	-5	5	-50	50	-49.66	50.73	0.000000	-48.34	-28.30	65.01	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.745	0.385	-5	5	-200	200	-92.05	206.97	0.000000	-48.34	-48.36	706.18	

**TABLE 3.3
GENERAL REPORTING TABLE FOR UNCERTAINTY**

A IPCC category	B Gas	C Base year emissions /removals	D Year t emissions /removals	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t	I Inventory trend in national emissions for year t increase with respect to base year	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂		276.705	-5	5	-5	5	-6.86	7.18	0.000012				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄		1.625	-5	5	-50	50	-50.04	51.69	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O		2.051	-5	5	-200	200	-91.73	210.95	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	3.024	0.992	-5	5	-50	50	-50.19	50.43	0.000000	-67.19	-18.01	39.80	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	3.816	1.252	-5	5	-200	200	-91.57	207.81	0.000000	-67.19	-30.80	469.95	
1.A.3.a Domestic Aviation	CO ₂	6.601	25.765	-5	5	-5	5	-6.95	6.95	0.000000	290.32	-37.14	40.34	
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	-5	5	-50	50	-49.64	51.79	0.000000	290.14	-215.20	472.48	
1.A.3.a Domestic Aviation	N ₂ O	0.049	0.191	-5	5	-200	200	-92.04	207.60	0.000000	290.14	-366.64	6720.32	
1.A.3.b Road Transportation	CO ₂	3,505.880	6,442.070	-5	5	-5	5	-7.06	7.13	0.006529	83.75	-17.62	19.15	
1.A.3.b Road Transportation	CH ₄	46.028	8.187	-5	5	-50	50	-50.09	50.60	0.000001	-82.21	-9.78	20.97	
1.A.3.b Road Transportation	N ₂ O	52.208	48.913	-5	5	-200	200	-92.27	210.86	0.000189	-6.31	-87.82	1586.74	
1.A.3.c Railways	CO ₂	140.079	46.523	-5	5	-5	5	-6.98	7.08	0.000000	-66.79	-3.06	3.43	
1.A.3.c Railways	CH ₄	0.195	0.058	-5	5	-50	50	-50.80	50.19	0.000000	-70.10	-16.40	36.21	
1.A.3.c Railways	N ₂ O	11.781	4.758	-5	5	-200	200	-91.92	207.13	0.000002	-59.61	-37.88	571.12	
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	152.976	-5	5	-5	5	-6.93	6.95	0.000004	13.74	-11.03	11.84	
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.355	0.405	-5	5	-50	50	-50.84	50.83	0.000000	13.96	-63.85	140.75	
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	0.961	1.095	-5	5	-200	200	-91.43	209.73	0.000000	13.95	-106.86	1854.65	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,048.466	-5	5	-5	5	-6.98	7.32	0.000173	-57.21	-4.07	4.58	
1.A.4 Other Sectors - Liquid Fuels	CH ₄	7.091	2.360	-5	5	-50	50	-50.93	50.33	0.000000	-66.72	-18.18	39.79	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	78.389	64.722	-5	5	-200	200	-90.29	208.33	0.000320	-17.44	-76.76	1125.24	
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	5.556	-5	5	-5	5	-6.90	7.24	0.000000	-98.94	-0.10	0.11	
1.A.4 Other Sectors - Solid Fuels	CH ₄	37.398	0.470	-5	5	-50	50	-51.24	50.45	0.000000	-98.74	-0.70	1.59	
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.114	0.022	-5	5	-200	200	-92.17	209.94	0.000000	-98.95	-0.99	15.00	

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				Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %		(fraction)	(% of base year)	(-) %	(+) %
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,668.428	-5	5	-5	5	-7.05	7.16	0.000438	124.23	-21.58	23.05					
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.870	4.164	-5	5	-50	50	-50.18	50.03	0.000000	122.61	-122.30	281.89					
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.497	0.788	-5	5	-200	200	-91.70	207.66	0.000000	58.50	-148.67	2372.32					
1.A.4 Other Sectors - Biomass	CH ₄	354.228	358.236	-5	5	-50	50	-50.96	50.55	0.001014	1.13	-55.26	118.75					
1.A.4 Other Sectors - Biomass	N ₂ O	44.700	45.207	-5	5	-200	200	-92.05	207.76	0.000160	1.13	-94.62	1356.62					
1.B.1 Fugitive emissions from Solid Fuels	CO ₂													2				
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	66.802												2				
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	34.181															
1. Exploration	CO ₂	28.536	6.181	-5	5	-50	50	-49.77	49.25	0.000000	-78.34	-11.85	26.21					
2. Production(7)	CO ₂	129.245	27.995	-5	5	-50	50	-50.21	50.50	0.000006	-78.34	-11.94	25.55					
3. Transport	CO ₂	0.005	0.005	-5	5	-50	50	-50.77	50.60	0.000000	7.82	-59.71	141.26					
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	246.878	54.963															
1. Exploration	CH ₄	17.030	3.689	-5	5	-100	100	-84.00	99.75	0.000000	-78.34	-18.56	129.29					
2. Production(7)	CH ₄	223.474	48.405	-5	5	-100	100	-84.65	100.92	0.000065	-78.34	-18.52	128.94					
3. Transport	CH ₄	1.504	1.622	-5	5	-100	100	-83.29	102.63	0.000000	7.82	-91.85	658.16					
4. Refining/storage	CH ₄	4.870	1.248	-5	5	-100	100	-84.37	100.83	0.000000	-74.38	-21.92	144.38					
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.056	0.012	-5	5	-10	1000	-82.02	1109.85	0.000000	-78.34	-20.76	492.83					
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	321.910															
1. Exploration	CO ₂																	
2. Production(7)	CO ₂	418.423	319.498	-5	5	-100	100	-84.48	102.90	0.002834	-23.64	-65.00	514.32					
3. Processing	CO ₂	6.276	2.359	-5	5	-100	100	-84.19	102.87	0.000000	-62.42	-32.00	236.16					
4. Transmission and storage	CO ₂	0.011	0.010	-5	5	-100	100	-83.94	99.43	0.000000	-5.84	-80.69	525.78					
5. Distribution	CO ₂	0.019	0.043	-5	5	-20	500	-89.09	550.10	0.000000	122.12	-212.34	4974.33					

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				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH₄	155.067	100.266											
1. Exploration	CH ₄													
2. Production(7)	CH ₄	74.418	27.968	-5	5	-100	100	-85.29	99.34	0.000021	-62.42	-32.25	217.44	
3. Processing	CH ₄	32.859	12.349	-5	5	-100	100	-83.51	101.45	0.000004	-62.42	-32.30	200.14	
4. Transmission and storage	CH ₄	36.108	33.999	-5	5	-100	100	-85.47	99.97	0.000032	-5.84	-81.33	609.97	
5. Distribution	CH ₄	11.682	25.949	-5	5	-20	500	-89.26	542.46	0.000242	122.12	-213.17	4948.35	
1.B.2.c. Venting and flaring	CO₂	0.002	0.000											
1. Venting - Oil	CO ₂	0.002	0.000	-5	5	-100	100	-85.31	100.11	0.000000	-95.71	-3.70	25.36	
1.B.2.c. Venting and flaring	CH₄	0.660	0.028											
1. Venting - Oil	CH ₄	0.660	0.028	-5	5	-100	100	-83.06	101.69	0.000000	-95.71	-3.64	26.39	
1.B.2.c. Venting and flaring	N₂O	0.560	0.119											
2. Flaring - Oil	N ₂ O	0.532	0.115	-5	5	-100	100	-82.49	99.84	0.000000	-78.34	-18.38	135.11	
2. Flaring - Gas	N ₂ O	0.028	0.004	-5	5	-100	100	-84.37	101.46	0.000000	-85.38	-12.51	89.01	
2.A.1 Cement Production	CO₂	1,086.203	1,099.079	-2	2	-2	2	-2.83	2.85	0.000030	1.19	-23.71	44.05	
2.A.2 Lime Production	CO₂	156.820	111.292	-2	2	-2	2	-2.77	2.84	0.000000	-29.03	-2.75	2.84	
2.A.3 Glass Production	CO₂	43.216	30.430	-2	2	-2	2	-2.82	2.82	0.000000	-29.58	-2.78	2.87	
2.A.4 Other Process Uses of Carbonates	CO₂	11.322	14.671											
2.A.4.a Ceramics	CO ₂	9.146	3.727	-2	2	-3	3	-3.58	3.59	0.000000	-59.25	-2.06	2.11	
2.A.4.b Other uses of Soda Ash	CO ₂													
2.A.4.d Other	CO ₂	2.176	10.944	-2	2	-3	3	-3.55	3.64	0.000000	402.88	-24.87	26.67	
2.B.1 Ammonia Production	CO₂	558.672	83.899	-2	2	-2	2	-2.81	2.83	0.000000	-84.98	-0.60	0.61	5
2.B.1 Ammonia Production	CH₄													
2.B.1 Ammonia Production	N₂O													

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				Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %		(fraction)	(% of base year)	(-) %	(+) %
2.B.2 Nitric Acid Production	N ₂ O	670.739	12.218	-2	2	-2	2	-2.82	2.88	0.000000	-98.18	-0.31	0.47					
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	-															
2.B.8.a Methanol	CO ₂													2				
2.B.8.b Ethylene	CO ₂	125.652																
2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer	CO ₂	0.414												2				
2.B.8.f Carbon Black	CO ₂	66.360												2				
2.B.8 Petrochemical and Carbon Black Production	CH ₄	6.101																
2.B.8.a Methanol	CH ₄													2				
2.B.8.b Ethylene	CH ₄	6.101																
2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer	CH ₄													2				
2.B.8.f Carbon Black	CH ₄													2				
2.C.1 Iron and Steel Production	CO ₂	43.808	13.394															
2.C.1.a Steel	CO ₂	19.505	13.394	-5	5	-5	5	-6.95	6.98	0.000000	-31.33	-9.83	12.34					
2.C.2 Ferroalloys Production	CO ₂	173.798																
2.C.2 Ferroalloys Production	CH ₄	4.366																
2.C.2 Ferroalloys Production	CO ₂	173.798												2				
2.C.2 Ferroalloys Production	CH ₄	4.366												2				
2.C.3 Aluminium Production	CO ₂	118.797																
2.C.3.a CO ₂ Emissions	CO ₂	118.797												2				
2.C.3 Aluminium Production	PFCs	1,117.284																
2.C.3.b By-Product Emission/CF ₄	PFCs	787.623												2				
2.C.3.b By-Product Emission/C ₂ F ₆	PFCs	329.661												2				
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	181.518	73.089															

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				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %		(fraction)	(% of base year)	(-) %	(+) %
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO ₂	31.217	18.504	-5	5	-50	50	-50.80	49.71	0.000003	-40.72	-32.88	71.68					
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO ₂	10.374	3.390	-5	5	-50	50	-49.98	50.51	0.000000	-67.32	-17.68	38.75					
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use	CO ₂	139.902	43.805	NA	NA	-50	50	-40.63	59.37	0.000015	-68.69	-15.71	31.47	4				
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt	CO ₂	0.015	0.064	-10	10	-50	50	-51.65	52.16	0.000000	332.56	-244.79	531.80					
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC	CO ₂		7.318	-5	5	-5	5	-6.86	7.21	0.000000								
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing	CO ₂	0.009	0.008	-10	10	-50	50	-49.92	51.04	0.000000	-12.28	-47.89	106.45					
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases		1,780.622															
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a	-	155.650	-50	50	-50	50	-52.72	122.80	0.000595				2				
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125	-	86.979	-50	50	-50	50	-52.15	124.25	0.000183				2				
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a	-	75.104	-50	50	-50	50	-39.91	196.77	0.000248				2				
2.F.1.a Commercial Refrigeration\HFC-32	HFC-32	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2				
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a	-	9.445	-30	30	-25	25	85.92	321.39	0.000004				2				
2.F.1.c Industrial Refrigeration\HFC-23	HFC-23	-	0.069	-50	50	-50	50	-62.46	78.92	0.000000				2				
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a	-	2.907	-50	50	-50	50	-70.28	42.12	0.000000				2				
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125	-	31.721	-50	50	-50	50	-71.24	37.67	0.000010				2				
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a	-	49.049	-50	50	-50	50	-71.21	35.86	0.000023				2				
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32	-	0.512	-50	50	-50	50	-76.80	11.71	0.000000				2				
2.F.1.c Industrial Refrigeration\C2F6	PFC-116	-	-	-50	50	-50	50	#VALUE!	#VALUE!	0.000123				2				
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a	-	8.613	-25	25	-25	25	-32.85	38.03	0.000000				2				
2.F.1.d Transport Refrigeration\HFC-125	HFC-125	-	18.882	-25	25	-25	25	-32.66	37.67	0.000001				2				
2.F.1.d Transport Refrigeration\HFC-143a	HFC-143a	-	33.789	-25	25	-25	25	-33.28	37.44	0.000005				2				
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a	-	400.198	-25	25	-25	25	-54.38	-5.70	0.000294				2				
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32	-	209.212	-50	50	-50	50	-61.67	83.44	0.000733				2				

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				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125	-	643.607	-50	50	-50	50	-62.34	76.69	0.006287				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a	-	54.885	-50	50	-50	50	-72.04	37.99	0.000028				2
2.F.1.f Stationary Air-Conditioning\HFC-143a	HFC-143a	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-152a	HFC-152a	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.2 Foam blowing agents	Aggregate F-gases	-	16.267											
2.F.2 Foam blowing agents\Cosed cells\HFC-134a	HFC-134a	-	14.829	-50	50	-25	25	-54.43	59.91	0.000002				2
2.F.2 Foam blowing agents\Cosed cells\HFC-152a	HFC-152a	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.2 Foam blowing agents\Cosed cells\HFC-227ea	HFC-227ea	-	0.552	-50	50	-25	25	-52.94	60.98	0.000000				2
2.F.2 Foam blowing agents\Cosed cells\HFC-365mfc	HFC-365mfc	-	0.887	-50	50	-25	25	0.00	0.00	0.000000				2
2.F.3 Fire Protection	Aggregate F-gases		5.611											
2.F.3 Fire Protection\HFC-125	HFC-125	-	0.874	-25	25	-10	10	-26.70	27.81	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-227ea	-	2.415	-25	25	-10	10	-26.49	27.41	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-236fa	-	2.322	-25	25	-10	10	14.12	97.57	0.000000				2
2.F.4 Aerosols	Aggregate F-gases		9.555											
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a	HFC-134a	-	9.169	-10	10	0	0	-10.17	10.07	0.000000				2
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-227ea	HFC-227ea	-	0.386	-10	10	0	0	-9.93	9.87	0.000000				2
2.G Other Product Manufacture and Use	N₂O	32.648	16.938											
2.G.3 N ₂ O from Product Uses\2.G.3.a Medical Applications	N ₂ O	32.118	16.922	-20	20	-10	10	-21.70	22.34	0.000000	-47.31	-14.61	19.66	
2.G.3 N ₂ O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products	N ₂ O	0.530	0.016	-50	50	-10	10	52560.17	160462.80	0.000002	-97.00	1429.25	7096.53	2
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.998											
2.G.1 Electrical Equipment\SF ₆	SF ₆	11.055	9.998	-25	25	-30	30	-87.10	-70.98	0.000000	-9.56	39.73	316.92	
3.A Enteric Fermentation	CH₄	2,336.027	1,020.852											
Mature dairy cattle	CH ₄	1,427.140	286.896	-3.4	3.4	-21	21	-21.32	21.37	0.000118	-79.90	-5.39	7.30	

TABLE 3.3
GENERAL REPORTING TABLE FOR UNCERTAINTY

A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Other mature cattle	CH ₄	87.596	140.649	-2	2	-21	21	-21.13	20.80	0.000027	60.57	-42.26	58.38	
Growing cattle	CH ₄	537.468	380.582	-1	1	-11	11	-11.08	11.11	0.000057	-29.19	-10.49	12.12	
Sheep	CH ₄	168.224	143.989	-10	10	-40	40	-41.69	41.36	0.000111	-14.41	-39.85	71.74	
Market swine	CH ₄	56.322	36.012	-6	6	-40	40	-93.94	-85.67	0.000000	-36.06	-60.46	-52.06	
Breeding swine	CH ₄	9.744	3.657	-6	6	-40	40	486.23	1283.22	0.000007	-62.47	162.35	647.41	
Goats	CH ₄	24.080	11.421	-10	10	-40	40	-41.40	41.71	0.000001	-52.57	-22.61	40.43	
Horses	CH ₄	19.656	15.832	-36	36	-40	40	-49.05	58.85	0.000002	-19.45	-44.77	100.16	
Mules and Asses	CH ₄	4.760	1.714	-5	5	-40	40	-39.81	40.74	0.000000	-64.00	-16.46	30.68	
Poultry	CH ₄													
Rabbits	CH ₄	1.037	0.100	-30	30	-20	20	-33.83	39.14	0.000000	-90.33	-3.94	6.81	
3.B Manure Management	CH₄	491.908	391.254											
Mature dairy cattle	CH ₄	179.558	87.599	-2	2	-38	38	-38.44	37.93	0.000035	-51.21	-21.31	36.86	
Other mature cattle	CH ₄	8.540	26.010	-2	2	-34	34	-33.22	34.15	0.000002	204.58	-118.94	204.50	
Growing cattle	CH ₄	62.321	86.915	-1	1	-21	21	-21.11	21.22	0.000010	39.46	-37.43	49.05	
Sheep	CH ₄	4.494	3.952	-10	10	-44	44	-44.79	45.71	0.000000	-12.07	-44.03	86.47	
Market swine	CH ₄	31.854	20.963	-7	7	-29	29	-29.68	30.65	0.000001	-34.19	-23.25	38.59	
Breeding swine	CH ₄	168.948	152.105	-7	7	-29	29	-29.40	30.04	0.000064	-9.97	-32.12	47.78	
Goats	CH ₄	0.655	0.318	-10	10	-30	30	-31.79	32.23	0.000000	-51.49	-17.72	28.29	
Horses	CH ₄	2.218	1.782	-36	36	-58	58	-61.36	76.79	0.000000	-19.66	-53.23	156.47	
Mules and Asses	CH ₄	0.397	0.143	-5	5	-43	43	-43.36	43.78	0.000000	-64.00	-17.58	35.77	
Poultry	CH ₄	31.885	11.368	-5	5	-44	44	-44.59	43.85	0.000001	-64.35	-17.68	34.55	
Rabbits	CH ₄	1.037	0.100	-30	30	-20	20	-34.20	38.02	0.000000	-90.33	-3.92	7.02	
3.B Manure Management	N₂O	284.426	103.383											

TABLE 3.3
GENERAL REPORTING TABLE FOR UNCERTAINTY

A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions/removals	Year t emissions/removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Mature dairy cattle	N ₂ O	65.915	5.153	-3.4	3.4	-50	153	-89.67	155.86	0.000001	-92.18	-7.16	91.05	
Other mature cattle	N ₂ O	4.323	4.553	-2	2	-50	153	-90.78	154.47	0.000001	5.32	-97.52	1265.57	
Growing cattle	N ₂ O	9.522	6.240	-1	1	-50	153	-91.27	155.81	0.000002	-34.47	-60.68	785.64	
Sheep	N ₂ O	3.529	3.652	-10	10	-50	100	-84.46	101.53	0.000000	3.47	-89.11	628.15	
Market swine	N ₂ O	8.375	0.808	-7	7	-50	153	-91.38	157.80	0.000000	-90.36	-8.94	115.32	
Breeding swine	N ₂ O	16.216	1.535	-7	7	-50	153	-90.88	156.93	0.000000	-90.53	-8.76	112.78	
Goats	N ₂ O	0.193	0.163	-10	10	-50	100	-84.67	103.31	0.000000	-15.68	-71.67	506.97	
Horses	N ₂ O	0.872	0.694	-36	36	-50	100	-84.68	114.32	0.000000	-20.35	-68.61	543.22	
Mules and Asses	N ₂ O	0.044	0.016	-5	5	-50	100	-84.40	101.07	0.000000	-64.00	-30.74	194.85	
Poultry	N ₂ O	20.325	10.924	-5	5	-50	100	-84.18	101.65	0.000003	-46.26	-45.83	339.29	
Rabbits	N ₂ O	7.810	0.755	-30	30	-50	100	-84.50	112.22	0.000000	-90.33	-8.26	64.16	
<i>Indirect N₂O emission</i>	<i>N₂O</i>	<i>147.302</i>	<i>68.891</i>											
Total N volatilised as NH ₃ and NO _x	N ₂ O	147.302	68.891	-34	34	-400	400	-91.00	447.59	0.001193	-53.23	-44.55	952.06	
3.D.1 Direct N₂O Emissions From Managed Soils	N₂O	952.297	677.569											
Inorganic N fertilizers	N ₂ O	447.300	368.252	-20	20	-70	200	-92.35	210.52	0.010862	-17.67	-77.26	1160.76	
Organic N fertilizers	N ₂ O	209.915	92.492	-10	10	-30	30	-31.37	32.49	0.000027	-55.94	-31.16	487.01	
Urine and dung deposited by grazing animals	N ₂ O	119.511	49.326	-10	10	-50	150	-90.71	150.77	0.000123	-58.73	-37.98	466.24	
Crop residues	N ₂ O	166.476	150.083	-20	20	-70	200	-91.62	216.19	0.001843	-9.85	-84.37	1300.46	
Mineralization/immobilization associated with loss/gain of soil organic matter	N ₂ O	0.149	8.469	-20	20	-30	30	-34.40	37.87	0.000000	5601.26	-4111.55	63872.92	
Cultivation of organic soils	N ₂ O	8.947	8.947	-10	10	-500	500	-89.39	558.72	0.000029	0.00	-95.54	2073.17	
3.D.2 Indirect N₂O Emissions From Managed Soils	N₂O	309.660	214.143											
Atmospheric deposition	N ₂ O	104.399	64.490	-20	20	-250	250	-91.66	272.64	0.000481	-38.23	-58.14	1052.02	
Nitrogen leaching and run-off	N ₂ O	205.261	149.653	-34	34	-400	400	-91.05	451.72	0.005934	-27.09	-69.98	1548.08	

**TABLE 3.3
GENERAL REPORTING TABLE FOR UNCERTAINTY**

A IPCC category	B Gas	C Base year emissions /removals	D Year t emissions /removals	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t	I Inventory trend in national emissions for year t increase with respect to base year	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments		
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %		(-) %	(+) %
3.G Liming	CO ₂		18.695	-50	50	-50	50	-82.69	-15.31	0.000001						
3.H Urea Application	CO ₂	50.020	42.013	-20	20	-50	0	-20.54	20.25	0.000002	-16.01	-21.40	28.07			
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,482.007	5,348.402					-61.93	137.09	0.913677	-17.49			1, 3		
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.655					-30.74	136.32	0.000634	829.93			1, 3		
4.B.1 Cropland Remaining Cropland	CO ₂	89.059	138.671					-245.00	550.64	0.009129	55.71			1, 3		
4.B.2 Land Converted to Cropland	CO ₂	25.846	119.946					-376.90	260.93	0.004295	364.08			1, 3		
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069					-207.96	-191.93	0.000000	0.00			1, 3		
4.C.2 Land Converted to Grassland	CO ₂	9.952	304.428					-186.88	104.76	0.006282	2958.99			1, 3		
4.D.1.1 Peat Extraction Remaining Peat Extraction	CO ₂															
4.D.1.2 Flooded Land Remaining Flooded Land	CO ₂															
4.D.1.3 Other Wetlands Remaining Other Wetlands	CO ₂															
4.D.2 Land Converted to Wetlands	CO ₂	77.232	12.448					-64.69	207.45	0.000010	-83.88			1, 3		
4.E.1 Settlements Remaining Settlements	CO ₂															
4.E.2 Land Converted to Settlements	CO ₂	235.440	585.504					-19.61	212.16	0.010391	148.69			1, 3		
4.F.1 Other Land Remaining Other Land	CO ₂															
4.F.2 Land Converted to Other Land	CO ₂															
4.G Harvested Wood Products	CO ₂	317.852	393.251					-14.84	83.16	0.001174	23.72			1, 3		
4(D). Direct N ₂ O emissions from N inputs to managed soils	N ₂ O															
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	43.898	148.525					-90.17	-28.58	0.000066	238.34			1, 3		
4(IV) Indirect N ₂ O Emissions from Managed Soils	N ₂ O															
4(V) Biomass Burning	CO ₂	14.979	382.039					-66.83	-33.36	0.000134	2450.57			1, 3		
4(V) Biomass Burning	CH ₄	1.378	37.147					-95.96	-70.40	0.000001	2595.56			1, 3		
4(V) Biomass Burning	N ₂ O	0.763	21.225					-95.78	-43.76	0.000001	2681.97			1, 3		

**TABLE 3.3
GENERAL REPORTING TABLE FOR UNCERTAINTY**

A IPCC category	B Gas	C Base year emissions /removals	D Year t emissions /removals	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t	I Inventory trend in national emissions for year t increase with respect to base year	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
5.A Solid Waste Disposal	CH₄	1,049.563	2,529.142											
5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH ₄	993.520	2,529.142	-10	10	-20	20	-21.19	25.11	0.010563	154.56	-67.52	99.01	
5.A.2 Unmanaged Waste Disposal Sites	CH ₄	56.043												
5.B Biological Treatment of Solid Waste	CH₄		19.335											
5.B Biological Treatment of Solid Waste\5.B.1 Composting	CH ₄		15.650	-10	10	-100	100	-83.87	101.60	0.000007				2
5.B Biological Treatment of Solid Waste\5.B.2 Anaerobic Digestion at Biogas Facilities	CH ₄		3.685	-10	10	-100	100	-83.31	103.41	0.000000				2
5.B Biological Treatment of Solid Waste	N₂O		8.887											
5.B Biological Treatment of Solid Waste\5.B.1 Composting	N ₂ O		8.887	-10	10	-110	110	-86.23	111.33	0.000003				2
5.C Incineration and Open Burning of Waste	CO₂	0.536												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Clinical Waste	CO ₂	0.123												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial Solid Wastes	CO ₂	0.413												2
5.C Incineration and Open Burning of Waste	N₂O	0.007												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial Solid Wastes	N ₂ O	0.007												2
5.C Incineration and Open Burning of Waste	N ₂ O	4.193	1.297							0.000000		-26.49	195.21	
5.C.2 Open burning waste\5.C.2.1 Biogenic\5.C.2.1.a Municipal Solid Wastes	N ₂ O	4.193	1.297	-30	30	-100	100	-85.17	115.29		-69.08	-26.49	195.21	
5.C Incineration and Open Burning of Waste	CH ₄	19.200	5.937							0.000000		-30.82	-25.91	
5.C.2 Open burning waste\5.C.2.1 Biogenic\5.C.2.1.a Municipal Solid Wastes	CH ₄	19.200	5.937	-30	30	-100	100	-99.66	-94.98	0.000000	-69.08	-30.82	-25.91	
5.D Wastewater Treatment and Discharge	CH₄	659.515	419.354											
5.D.1 Domestic wastewater	CH ₄	551.417	317.960	-30	30	-30	30	-39.38	45.90	0.000582	-42.34	-26.55	49.19	
5.D.2 Industrial wastewater	CH ₄	108.098	101.394	-30	30	-30	30	-39.42	45.27	0.000060	-6.20	-43.94	79.56	
5.D Wastewater Treatment and Discharge	N₂O	59.478	88.788											
5.D.1 Domestic wastewater	N ₂ O	59.478	88.788	-50	50	-50	50	-73.88	25.72	0.000062	49.28	-129.74	39.85	
TOTAL	CO₂eq	25,689.271	20,822.270					-11.10	43.15	1.000002	-18.95	-20.81	26.96	

Approach and Comments:

1 - A more complex method for estimation of uncertainties is used, and therefore activity data and emission factor uncertainties are left blank. Only combined uncertainty and trend uncertainty is shown in model.

2 - Trend not calculated, when base year or year t emissions are zero or included elsewhere.

3 - Combined uncertainty was used through Monte Carlo simulation for LULUCF sector

4 - Different units of AD

5 - Recovery included in estimation of GHG emission

Annex 3: Detailed methodological descriptions for individual source or sink categories

3.1. Energy sector

Table A3-1: 1A1ai - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption	UNIT								
Hard coal	1000 t	253.70	569.80	887.50	915.60	872.90	434.60	528.20	550.40
Fuel oil	1000 t	570.40	283.40	284.00	15.10	10.60	0.00	0.00	0.00
Light heating oil	1000 t	0.30	0.20	3.00	0.90	2.10	1.10	0.40	9.90
Natural gas	1000000 m3	201.70	155.80	36.30	24.00	52.50	5.60	4.30	7.60
Coke oven gas	1000000 m3	24.50							
Biogas	PJ			0.11	0.02	0.25	0.37	0.36	0.34
Other biomass	PJ				0.00	0.00	0.00	0.00	0.00
Net calorific values									
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	25.00	24.572	24.292	24.79
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	TJ/PJ	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass									
EMISSION FACTORS		1990	2000	2005	2010	2015	2020	2021	2022
EF CO2 t/TJ	t/TJ								
EF CO2 -Hard coal	t/TJ	93.31	93.31	93.31	93.31	92.69	92.39	93.10	92.88
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.28	55.28	55.28	55.28	55.56	55.34	55.46	56.01
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogas	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CH4 kg/TJ	kg/TJ								
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N2O kg/TJ	kg/TJ								
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogas	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table A3-2: 1A1a ii - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption	UNIT								
Hard coal	1000 t								
Fuel oil	1000 t	118.00	108.60	162.00	108.30	35.80	0.00	0.00	0.00
Light heating oil	1000 t	0.00	0.90	1.50	0.10	0.00	0.00	0.00	5.40
Natural gas	1000000 m3	315.50	363.40	479.00	649.90	343.70	783.50	736.40	833.30
Coke oven gas	1000000 m3								
Biogas	PJ				0.14	1.07	2.97	3.64	3.31
Other biomass	TJ				1.90	2189.00	9524.20	11187.50	13289.30
Net calorific values									
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	25.00	24.57	24.29	24.79
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	TJ/PT	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EMISSION FACTORS		1990	2000	2005	2010	2015	2020	2021	2022
EF CO2 t/TJ	t/TJ								
EF CO2 -Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.26	55.26	55.26	55.26	55.25	55.41	55.35	55.25
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogass	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CH4 kg/TJ	kg/TJ								
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	3.67	2.73	2.87	3.67	2.42	3.70	3.58	2.58
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N2O kg/TJ	kg/TJ								
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Table A3-3: 1A1aiii - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption	UNIT								
Hard coal	1000 t				0.00				
Fuel oil	1000 t	0.00	37.00	39.00	23.20	3.70	1.20	0.50	0.60
Light heating oil	1000 t	0.00	4.40	6.70	4.90	3.90	1.90	3.50	4.30
Natural gas	1000000 m3	0.00	53.00	71.30	86.50	72.40	53.00	53.60	45.20
Coke oven gas	1000000 m3								
Biogas	PJ				0.00	0.00	0.0000	0.0000	0.0000
Other biomass	PJ				0.00	0.00	0.0214	0.0230	0.0170
Gas works gas	1000000 m3			1.46					
Liquified petroleum gas	1000 t	0.00							
Net calorific values									
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13		24.57	24.29	24.79
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	TJ/PJ				1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass	TJ/PJ				1000.00	1000.00	1000.00	1000.00	1000.00
NCV for gas works gas	MJ/m3			21.47					
NCV for LPG	MJ/kg	46.89							
EMISSION FACTORS		1990	2000	2005	2010	2015	2020	2021	2022
EF CO2 t/TJ	t/TJ								
EF CO2 -Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 -Biogas	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CO2 - Gas works gas	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - LPG	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CH4 kg/TJ	kg/TJ								
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogass	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF CH4 - Gas works gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - LPG	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O kg/TJ	kg/TJ								
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - Gas works gas	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - LPG	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

Table A3-4: 1Ab - activity data NCV and emission factors

		1990	2000	2005	2010	2015	2020	2021	2022
Refining - transformation									
Fuel consumption									
Fuel oil (1000 t)	1000 t	355.04	239.40	254.00	244.30	134.10	23.00	25.50	59.10
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG I Gas/diesel oil (1000 t)	1000 t	0.79	2.20	9.50	0.00	0.00	0.00	0.00	0.00
NCV for gas/diesel oil (MJ/kg)	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Petroleum coke (1000 t)	1000 t	53.69	63.00	70.70	55.90	31.30	21.70	22.50	19.70
NCV for petroleum coke (MJ)	MJ/kg	29.31	29.31	31.00	31.00	31.00	31.00	31.00	31.00
Refinery gas (1000 t)	1000 t	405.94	262.40	241.10	161.50	208.10	114.20	98.50	87.60
NCV for refinery gas (MJ/kg)	MJ/kg	48.57	48.57	48.57	48.57	42.60	42.60	42.60	42.60
Natural gas (1000000 m3)	1000 t	7.31	0.20	1.20	27.10	183.30	211.10	178.10	116.70
NCV for natural gas (MJ/m3)	MJ/m3	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
Total fuel consumption (TJ)	TJ	35844.4	24322.7	24596.4	20316.8	21567.0	13801.9	12151.9	10837.2
Emission factors									
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - petroleum coke (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - refinery gas (t/TJ)	t/TJ	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60
EF CO2 - natural gas (t/TJ)	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	Gg	2,424.74	1,683.27	1,729.54	1,448.87	1,387.39	835.52	745.35	695.24
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - LPG (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - petroleum coke (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - refinery gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - natural gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	Mg	64.38	43.57	45.01	39.95	32.35	15.65	14.20	15.59
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - petroleum coke (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - refinery gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	Mg	12.92	9.83	10.63	9.37	6.21	2.78	2.70	3.13

Table A3-5: 1Aci - activity data NCV and emission factors

Manufacture of solid fuels and other energy industries	1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption								
LPG (1000 t)								
NCV for LPG (MJ/kg)								
Gas Coke (1000000 m3)	107.40							
NCV for gas coke (MJ/m3)	17.91							
Light heating oil (1000 t)								
NCV for light heating oil (MJ/kg)								
Natural gas (1000000 m3)								
NCV for natural gas (MJ/m3)								
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Total fuel consumption (TJ)	1,923.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	85.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table A3-6: 1Acii - activity data NCV and emission factors

Manufacture of solid fuels and other energy industries	1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption								
LPG (1000 t)	11.87	1.00						
NCV for LPG (MJ/kg)	46.89	46.89						
Gas Coke (1000000 m3)								
NCV for gas coke (MJ/m3)								
Light heating oil (1000 t)	0.75	7.10	5.50					
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71					
Natural gas (1000000 m3)	413.80	164.50	175.50	241.70	121.30	103.60	120.70	154.80
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Total fuel consumption (TJ)	14,657.46	5,943.13	6,201.91	8,217.80	4,196.98	3,602.17	4,224.50	5,464.44
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	826.75	339.20	352.16	461.02	235.45	202.08	236.99	306.56
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	14.72	6.55	6.67	8.22	4.20	3.60	4.22	5.46
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	1.48	0.75	0.74	0.82	0.42	0.36	0.42	0.55

Table A3-7: 1Aciii - activity data NCV and emission factors

Manufacture of solid fuels and other energy industries	1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption								
LPG (1000 t)								
NCV for LPG (MJ/kg)								
Gas Coke (1000000 m3)								
NCV for gas coke (MJ/m3)								
Light heating oil (1000 t)		0.40						
NCV for light heating oil (MJ/kg)		42.71						
Natural gas (1000000 m3)		0.50						
NCV for natural gas (MJ/m3)		34.00						
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Biogas					26.54	19.79082	40.58	44.34
NCV for biogas (TJ/TJ)					1.00	1.00	1.00	1.00
Total fuel consumption (TJ)	0.00	34.08	0.00	0.00	0.00	0.00	0.00	0.00
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - other kp (t/TJ)	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15
EF CO2 - biogas (t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO2 Emission (Gg)	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - other kp (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - biogas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - biogas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Table A3-8: 1A2a-g – fuel consumption

1A2a Iron and Steel									
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	10 ³ t	7.474	0	0	0.6	0.9	0.9	3.7	4.3
Coking coal (kameni ugljen)	10 ³ t	0	0	1	0	1.8	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	18.248	0	0	0	0	0	0	0
Lignite	10 ³ t	9.349	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	119.957	25.2	22.9	35	17.5	13.5	19.6	20.2
Wood	10 ³ m ³	0	0		0.8	0.5	0.2	0.2	0.1
Biogas	TJ	0	0		0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	1.8	3.5	3.9
Briketi ugljena	10 ³ t	0	0				0		
Coke oven coke	10 ³ t	179.937	11.8	4.3	3.7	0.6	0.3	0.2	0.2
Liquified petroleum gas	10 ³ t	3.554	2.1	4.2	1.4	0.8	0.7	0.7	2.3
Motor Gasoline	10 ³ t	0	0		0	0	0.1	0	0
Petroleum	10 ³ t					0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0.2	0.3	0.3
Gas/Diesel oil	10 ³ t	12.907	4	2.7	0.9	0.6	0.6	0.7	1
Residual fuel oil	10 ³ t	42.516	1.5	2.7	1.2	1.1	0	0	0
Petroleum coke	10 ³ t	8.602	0	0	0.7	0.3	0	0.8	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0		0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	418.079	0				0		
Koksni plin	10 ³ m ³	0	0						
Gas works gas	10 ³ m ³	0	0	0.031	0	0	0	0	0

1A2b Non-Ferrous metals									
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	10 ³ t	0	0	0.1	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0.2	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	0	5	1	0.4	2.6	11.7	13.9	13.6
Wood	10 ³ m ³	0	0		0.6	0.2	0.3	0	0
Biogas	TJ	0	0		0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0
Briketi ugljena	10 ³ t	0	0				0		
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	1.534	1.1	2.1	3.1	0.8	0.7	0.8	0.8
Motor Gasoline	10 ³ t	0	0		0	0	0	0	0
Petroleum	10 ³ t					0.2	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0.2	0.2	0.2
Gas/Diesel oil	10 ³ t	2.818	1	0.2	0.1	0.9	0.2	0.2	0.4
Residual fuel oil	10 ³ t	1.077	0.3	4	1.2	0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0.1
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0		0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0						
Koksni plin	10 ³ m ³	0	0						
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2c Chemicals									
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	10 ³ t	0	0	0.2	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	1.2	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	43.77	1.2	0	0	0	0	0	0.5
Lignite	10 ³ t	27.507	0.6	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	181.214	186.5	183.1	227.6	146.9	169.1	115.6	33.1
Wood	10 ³ m ³	0	0		0.1	0	0	0	0
Biogas	TJ	0	0		0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0.2	0.2	0.3
Briketi ugljena	10 ³ t	0	0				0		
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0.724	6.9	0	0.1	0	0	0	0
Motor Gasoline	10 ³ t	0	0		0	0	0	0	0
Petroleum	10 ³ t					2.4	1.5	1.8	1
Diesel	10 ³ t	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	3.868	2	0.5	0.4	0.5	0.4	0.4	0.9
Residual fuel oil	10 ³ t	89.079	102.8	73	3.6	0	0.1	0.1	0
Petroleum coke	10 ³ t	0	0	0.7	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0		0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0						
Koksni plin	10 ³ m ³	0	0						
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0

1A2d Pulp, paper and print									
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	10 ³ t	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	42.51	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	92.536	75	69.2	68.8	27.6	57.9	60.4	58.1
Wood	10 ³ m ³	0	0		13.2	0.1	0	0.7	4.3
Biogas	TJ	0	0		0	0	0	0	0
Wood waste	TJ	81.9	1.4	169.4	151.8	20	192.2	87.1	73.2
Briketi ugljena	10 ³ t	0	0				0		
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0	0	0.1	0.1	0.1	0.1	0.1	0.1
Motor Gasoline	10 ³ t	0	0		0	0	0	0	0
Petroleum	10 ³ t					0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	0.405	0.9	1.6	0.1	0	0	0	0.1
Residual fuel oil	10 ³ t	18.364	2.4	11.9	9.5	5.2	0.7	0.8	0.8
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0		0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0						
Koksni plin	10 ³ m ³	0	0						
Gas works gas	10 ⁶ m ³	0	0	0.031	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2e Food Processing, Beverages and Tobacco										
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022	
Anthracite	10 ³ t	0	0	0	0.7	0	0	0	0	0.1
Coking coal (kameni ugljen)	10 ³ t	0.426	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	89.92	23.9	47.7	39.9	34	11.9	0	0	0
Lignite	10 ³ t	35.745	11.2	0	0	0	0	0	0	0.6
Natural gas	10 ⁶ m ³	92.34	101.6	173	166.6	114.7	112.1	97.5		122
Wood	10 ³ m ³	0	0		0.5	13.5	1.5	1.6		1.9
Biogas	TJ	0	0		0	0	0	0		0
Wood waste	TJ	0	0	0	0	0	290.6	362.1		313.5
Briketi ugljena	10 ³ t	0.16	0				0			
Coke oven coke	10 ³ t	6.841	2.3	9.6	6.4	4	3.6	1.9		2.3
Liquified petroleum gas	10 ³ t	1.09	0.8	1.6	1.3	1.4	1	1.2		1.3
Motor Gasoline	10 ³ t	0	0		0		0	0		0
Petroleum	10 ³ t						0	0		0
Diesel	10 ³ t	0	0	0	0		0	0.3	0.2	0.2
Gas/Diesel oil	10 ³ t	36.196	15.2	13.3	10	8.7	5.3	6		10.3
Residual fuel oil	10 ³ t	72.165	40.3	32.4	22.9	9.1	7.7	7.1		9.1
Petroleum coke	10 ³ t	0	0	0	0	0	0	0		0
Refinery gas	10 ³ t	0	0	0	0	0	0	0		0
Other oil derivates	10 ³ t	0	0		0	0	0	0		0
Visokopećni plin	10 ⁶ m ³	0	0							
Koksni plin	10 ³ m ³	0	0							
Gas works gas	10 ⁶ m ³	6.1	0	0.1099	0	0	0	0		0

1A2f Non-Metallic Minerals										
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022	
Anthracite	10 ³ t	0	0	0.1	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	121.384	52.6	73.4	56.4	41.8	45.7	51.9		51.9
Wood	10 ³ m ³	0	0		0	0	0	0		0
Biogas	TJ	0	0		0	0	0	0		0
Wood waste	TJ	0	0	0	0	0	0	0.3	1.6	0.5
Briketi ugljena	10 ³ t	0	0				0			
Coke oven coke	10 ³ t	6.804	7.2	7.7	0.1	0	0	0		0
Liquified petroleum gas	10 ³ t	6.567	3	2.2	0.2	0.2	0.2	0.3		0.3
Motor Gasoline	10 ³ t	0	0		0		0	0		0
Petroleum	10 ³ t						0	0		0
Diesel	10 ³ t	0	0	0.1	0		0	0.1	0.1	0.1
Gas/Diesel oil	10 ³ t	1.627	0.4	2.7	0	0	0	0		0
Residual fuel oil	10 ³ t	6.093	2.3	3.8	2.2	0	0	0		0
Petroleum coke	10 ³ t	0	0	0	0	0	0	1.8		0
Refinery gas	10 ³ t	0	0	0	0	0	0	0		0
Other oil derivates	10 ³ t	0	0		0	0	0	0		0
Visokopećni plin	10 ⁶ m ³	0	0							
Koksni plin	10 ³ m ³	0	0							
Gas works gas	10 ⁶ m ³	0	3.3	0.923	0	0	0	0		0

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction									
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	10 ³ t	99.727	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	40.732	53.2	168.3	193.4	74.7	119.8	132.8	81.2
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	18.129	3	5	1.1	2.7	0	0.1	2.6
Lignite	10 ³ t	0.065	2.5	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	137.217	178.9	124.4	76.4	40.7	53.4	62.4	62.5
Wood	10 ³ m ³	0	0		0.3	0.9	6.6	6.9	5.7
Biogas	TJ	0	0		0	0	0	0	0
Wood waste	TJ	0	57.8	0	370.6	289	138.5	67	89.5
Briketi ugljena	10 ³ t	2.829	0				0		
Coke oven coke	10 ³ t	3.64	16.1	0	17.3	20.6	26.3	27.4	30.2
Liquified petroleum gas	10 ³ t	0	3.3	4.6	3.2	1.6	0.5	1.2	0.6
Motor Gasoline	10 ³ t	0	0		0	0	0.1	0.2	0.1
Petroleum	10 ³ t					0	0	0	0
Diesel	10 ³ t	0	0	15	14.3	11.1	6.9	6.7	7.5
Gas/Diesel oil	10 ³ t	17.142	34	7	4.3	2.7	4	4.6	5
Residual fuel oil	10 ³ t	127.115	135	53.1	7.3	3.9	2.1	1.7	2.5
Petroleum coke	10 ³ t	0	0	171.6	115.3	167.2	100.7	88	109.8
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0		0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0						
Koksn plin	10 ³ m ³	0	0						
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0
Industrial waste-non ren.	TJ				319.1	390	1630.3	1875	1929

1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo)										
Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022	
Anthracite	10 ³ t	0	0	0	0	0	0	0	0	
Coking coal (kameni ugljen)	10 ³ t	0.794	0	0	0	0	0	0	0	
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	48.369	0.1	4.2	0	0	0	0	0	
Lignite	10 ³ t	0.431	0.1	0.2	0	0	0	0	0	
Natural gas	10 ⁶ m ³	79.309	55	65.3	54.4	44.2	45.5	50.2	50	
Wood	10 ³ m ³	0	0		39.4	27.4	21.9	21	21.8	
Biogas	TJ	0	0		0	0	0	0	0	
Wood waste	TJ	3518.1	2224.4	2087.5	1456.677	579	584.9	524.8	395.9	
Briketi ugljena	10 ³ t	0.311	0				0			
Coke oven coke	10 ³ t	2.549	0.3	1	0.1	0	0	0	0	
Liquified petroleum gas	10 ³ t	3.317	3.2	8	6.8	5.7	5.3	6.7	3.7	
Motor Gasoline	10 ³ t	0	0	6.9	5.1	4	0.1	3.5	3.5	
Petroleum	10 ³ t					0	0	0	0	
Diesel	10 ³ t	0	0	110.6	102.2	79.2	92.7	106.2	114.5	
Gas/Diesel oil	10 ³ t	17.87	7.6	23	12.2	8.7	4.4	9.6	10.1	
Residual fuel oil	10 ³ t	59.519	19.4	17.7	8.4	3.8	1.8	2.1	1.9	
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	
Other oil derivates	10 ³ t	0	0		0	0	0	0	0	
Visokopećni plin	10 ⁶ m ³	0	0							
Koksn plin	10 ³ m ³	0	0							
Gas works gas	10 ⁶ m ³	0	3.5	2.456	0	0	0	0	0	

Fuel consumption	Unit	1990	2000	2005	2010	2015	2020	2021	2022
Motorni benzin	TJ	477.113	169.442	236.327	245.245	191.737	169.442	164.983	160.5240000
Dizelsko gorivo	TJ	3993.385	2861.57	4856.127	4527.26	3562.014	4288.084	4856.127	5244.7880000

Table A3-8: 1A2a-g – NCV and emission factors

Net Calorific Value		1990	2000	2005	2010	2015	2020	2021	2022
Anthracite	MJ/kg	29.29	29.31	29.31	29.31	29.31	29.31	29.31	29.31
Coking coal (kameni ugljen)	MJ/kg	25.14	26.15	25.1	24.77332	26.7	27	26.48	26.78
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	16.74	17.8	18.5	17.6	17	18.43	18.5	18.5
Lignite	MJ/kg	10.9	12	12.1		0	11.2	0	0
Natural gas	MJ/m3	34	34	34.0	34.0	34.6	34.77	35	35.3
Wood	MJ/m3	9	9	9.0	9.0	9	9	9	9
Biogas	TJ/TJ	1	1	1.0	1.0	1	1	1	1
Wood waste	TJ/TJ	1	1	1.0	1.0	1	1	1	1
Briketi ugljena	MJ/kg	16.74							
Coke oven coke	MJ/kg	29.31	29.31	29.3	29.3	29.31	29.31	29.31	29.31
Liquified petroleum gas	MJ/kg	46.89	46.89	46.9	46.9	46.89	46.89	46.89	46.89
Motor Gasoline	MJ/kg	44.59	44.59	44.6	44.6	44.59	44.59	44.59	44.59
Petroleum	MJ/kg	43.94	43.96			43.96	43.96	43.96	43.96
Diesel	MJ/kg	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71
Gas/Diesel oil	MJ/kg	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71
Residual fuel oil	MJ/kg	40.19	40.19	40.2	40.2	40.19	40.19	40.19	40.19
Petroleum coke	MJ/kg	29.31	31	31.0	31.0	31	31	31	31
Refinery gas	MJ/kg					0	42.6	0	0
Other oil derivates	MJ/kg					0	40.19	0	0
Visokopećni plin	MJ/m3								
Koksnii plin	MJ/m3	17.91							
Gas works gas	MJ/m3	15.82	15.8	21.47		0		0	0
Industrial waste-non ren.	TJ/TJ	1.0	1.0	1.0	1.0	1	1	1	1

Table A3-9: 1A2a-g –emission factors

Fuel type	EF CO2, t/TJ	EF CH4, kg/TJ	EF N2O, kg/TJ
Anthracite	98.3	10	1.5
Coking coal (kameni ugljen)	94.6	10	1.5
Sub-Bituminous Coal (Mrki ugljen)	96.1	10	1.5
Lignite	101	10	1.5
Natural gas	56.1	1	0.1
Wood	112	30	4
Biogas	79.6	3	0.6
Wood waste	143	30	4
Coke oven coke	107	10	1.5
Liquified petroleum gas	63.1	1	0.1
Motor Gasoline	69.3	3	0.6
Diesel	74.1	3	0.6
Gas/Diesel oil	74.1	3	0.6
Residual fuel oil	77.4	3	0.6
Petroleum coke	97.5	3	0.6
Refinery gas	57.6	1	0.1
Other oil derivates	0	3	0.6
Gas works gas	44.4	1	0.1
Other fosil fuels	143	30	4

Table A3-11: 1A3a – fuel consumption, NCV and emission factors

		1990	2000	2010	2015	2020	2021	2022
Domestic aviation								
Fuel consumption								
Aviation gasoline	1000 t	0.00	0.00	1.00	0.30	0.40	0.50	0.40
NCV for gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Jet kerosene	1000 t	2.00	8.00	9.00	9.50	4.90	6.60	7.80
NCV for jet kerosene	MJ/kg	44.00	43.96	43.96	43.96	43.96	43.96	43.96
Motor gasoline	1000 t	0.10	0.10					
NCV motor gasoline	MJ/kg	44.59	44.59					
Total fuel consumption	TJ	92.46	356.14	440.23	431.00	233.24	312.43	360.72
Emissions								
EF CO ₂ - aviation gasoline	t/TJ	70.00	70.00	70.00	70.00	70.00	70.00	70.00
EF CO ₂ - jet kerosene	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO ₂ - motor gasoline	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30
CO₂ Emission	Gg	6.60	25.45	31.41	30.80	16.65	22.31	25.77
EF CH ₄ - gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH ₄ - jet kerosene	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH ₄ - motor gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CH₄ Emission	Mg	0.05	0.18	0.22	0.22	0.12	0.16	0.18
EF N ₂ O - gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - jet kerosene	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - motor gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N₂O Emission	Mg	0.18	0.71	0.88	0.86	0.47	0.62	0.72

Table A3-12: 1A3b – fuel consumption, NCV and emission factors

1A3bi	CARS		1990	2000	2005	2010	2015	2020	2021	2022
FUEL CONSUMPTION										
Gasoline	TJ		31889.08	32292.86	29259.62	26732.34	21817.61	16082.50	18016.03	19327.90
Diesel oil	TJ		1638.19	8880.71	19728.46	25322.92	32003.51	33384.62	36234.77	39065.64
LPG	TJ	#DIV/0!	459.52	1036.27	2752.44	3141.63	2475.79	2593.02	2175.70	
CNG	TJ				2.34	3.62	12.84	12.228	10.311	
Biodiesel	TJ				59.130177	598.4200945	1702.05292	2367.61217	545.14	
NCV										
Gasoline	MJ/kg		1	1	1	1	1	1	1	1
Diesel oil	MJ/kg		1	1	1	1	1	1	1	1
LPG	MJ/kg		1	1	1	1	1	1	1	1
CNG	MJ/106m ³		1	1	1	1	1	1	1	1
Biodiesel	MJ/kg									
EF CO₂										
EF CO ₂ - gasoline (t/TJ)	t/TJ		69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
EF CO ₂ - diesel (t/TJ)	t/TJ		74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
EF CO ₂ - LPG (t/TJ)	t/TJ		63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
EF CO ₂ - CNG (t/TJ)	t/TJ		56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
EF CO ₂ - Biodiesel (t/TJ)	t/TJ		70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

1A3bii	LIGHT DUTY TRUCKS		1990	2000	2005	2010	2015	2020	2021	2022
	FUEL CONSUMPTION									
	Gasoline	TJ	1394.4738	1040.8302	666.77447	421.99073	228.3064714	221.492924	234.429233	253.392775
	Diesel oil	TJ	3357.0545	5345.5403	9130.0068	7984.733	5372.147924	6774.61926	8264.92243	9487.83389
	LPG	TJ	0	0	0	0	0	0	0	0
	CNG	TJ								
	Biodiesel	TJ				23.550799	131.6868794	336.435199	467.99254	107.755508
	NCV									
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg								
	EF CO2									
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8
1A3biii	HEAVY DUTY TRUCKS+BUSSES		1990	2000	2005	2010	2015	2020	2021	2022
	FUEL CONSUMPTION									
	Gasoline	TJ	149.5810	54.2238	53.9165	26.2786	30.4085	9.8617	4.9062	5.2771
	Diesel oil	TJ	10645.1605	9597.3914	11955.2053	13673.2825	14636.2389	16234.2970	15613.6958	17013.8924
	LPG	TJ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	CNG	TJ				86.0566	134.7824	115.8095	155.7717	141.4787
	Biodiesel	TJ				31.7089	290.0421	684.1301	951.6477	219.1173
	NCV									
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	1	1	1	1	1	1
	EF CO2									
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8
1A3biv	MOTORCYCLES		1990	2000	2005	2010	2015	2020	2021	2022
	FUEL CONSUMPTION									
	Gasoline	TJ	432.971	687.760	942.854	1205.384	1110.474	902.343	1029.812	1107.647
	Diesel oil	TJ	0.000	0.000	0.000	0.063	0.344	0.745	0.941	1.024
	LPG	TJ								
	CNG	TJ								
	Biodiesel	TJ				0.0001431	0.006221066	21.9344675	30.5115732	7.02530442
	NCV									
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	1	1	1	1	1	1
	EF CO2									
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

Table A3-13: 1A3c– fuel consumption, NCV and emission factors

Rail transport									
		1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption									
Gasoline (1000 t)	1000 t	0.10	0.10						
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59						
Diesel (1000 t)	1000 t	36.10	27.20	30.50	28.50	17.50	13.30	14.30	14.70
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	0.20							
NCV for fuel oil (MJ/kg)	MJ/kg	40.19							
Light heating oil (1000 t)	1000 t	1.10							
NCV for light heating oil (MJ/	MJ/kg	42.71							
Brown coal (1000 t)	1000 t	10.00							
NCV for brown coal (MJ/kg)	MJ/kg	16.74							
Lignite (1000 t)	1000 t	4.30							
NCV for lignite (MJ/kg)	MJ/kg	10.90							
Jet Kerosene (1000 t)	1000 t	0.10							
NCV for jet kerosene (MJ/m3)	MJ/kg	43.94							
Total fuel consumption (TJ)	TJ	1,819.97	1,166.17	1,302.66	1,217.24	747.43	568.04	610.75	627.84
Emissions									
EF CO2 - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - diesel (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - light heating oil (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - brown coal (t/TJ)	t/TJ	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - jet kerosene (t/TJ)	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO2 - petroleum (t/TJ)	t/TJ								
CO2 Emission (Gg)	Gg	140.08	86.39	96.53	90.20	55.38	42.09	45.26	46.52
EF CH4 - gasoline (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - diesel (kg/TJ)	kg/TJ	4.15	3.32	3.32	3.32	3.32	3.32	3.32	3.32
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - light heating oil (kg/	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - brown coal (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF CH4 - lignite (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - jet kerosene (t/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - petroleum (t/TJ)	kg/TJ								
CH4 Emission (Mg)	Mg	6.97	3.87	4.32	4.04	2.48	1.89	2.03	2.08
EF N2O - gasoline (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	kg/TJ	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - light heating oil (kg/	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - brown coal (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - jet kerosene (t/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - petroleum (t/TJ)	kg/TJ								
N2O Emission (Mg)	Mg	44.46	33.23	37.26	34.81	21.38	16.25	17.47	17.96

Table A3-14: 1A3d– fuel consumption, NCV and emission factors

National navigation		1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption									
Gasoline (1000 t)	1000 t	0.10	0.30						
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59						
Diesel (1000 t)	1000 t	38.70	25.70	31.80	34.80	41.20	40.20	46.90	48.30
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	2.10	1.40		2.00				
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19		40.19				
Light heating oil (1000 t)	1000 t	1.60							
NCV for light heating oil (MJ/kg)	MJ/kg	42.71							
Total fuel consumption (TJ)		1,810.07	1,167.29	1,358.18	1,566.69	1,759.65	1,716.94	2,003.10	2,062.89
Emissions									
EF CO ₂ - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO ₂ - diesel (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO ₂ - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO ₂ - light heating oil (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO₂ Emission (Gg)	Gg	134.38	86.62	100.64	116.36	130.39	127.23	148.43	152.86
EF CH ₄ - gasoline (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - diesel (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - fuel oil (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - light heating oil (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
CH₄ Emission (Mg)	Mg	12.67	8.17	9.51	10.97	12.32	12.02	14.02	14.44
EF N ₂ O - gasoline (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - diesel (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - fuel oil (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - light heating oil (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N₂O Emission (Mg)	Mg	3.48	2.33	2.72	3.13	3.52	3.43	4.01	4.13

Table A3-15: 1A4a– fuel consumption, NCV and emission factors

Commercial/Institutional	1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption								
Petroleum (1000 t)	3.80							
NCV for jet kerosene (MJ/kg)	43.94							
Light heating oil (1000 t)	90.30	120.50	131.60	73.80	44.60	25.60	22.70	24.70
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	67.60	3.90	6.60	8.00	2.70	0.00	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.30	13.90	20.10	12.90	12.30	10.00	11.70	8.60
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Anthracite (1000 t)								
NCV for anthracite (MJ/kg)								
Brown coal (1000 t) (MU)	24.50	9.50	0.20	2.20		0.00	0.00	0.00
NCV for brown coal (MJ/kg)	16.74	17.80	18.50	17.60	16.89	18.43	18.50	18.50
Lignite (1000 t)	40.00	1.20	0.60	0.30	0.10	0.00	0.00	0.00
NCV for lignite (MJ/kg)	10.90	12.00	12.10	11.60	10.50	11.20	11.50	11.50
Briquettes (1000 t)	2.90							
NCV for briquettes (MJ/kg)	16.74							
Gas work gas (1000000 m3)	4.90	1.50	3.43	2.84	0.39			
NCV for gas work gas (MJ/m3)	15.82	19.49	21.47	18.72	17.10			
Natural gas (1000000 m3)	124.30	98.20	151.20	192.70	204.80	235.90	278.70	232.00
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
Gasoline (1000 t)								
NCV for gasoline (MJ/kg)								
Petroleum coke (1000 t)	1.50							
NCV for petroleum coke (MJ/kg)	33.57							
Anthracite (1000 t)								
NCV for anthracite (MJ/kg)								
Solid Biomass-Wood (TJ) + characoal	0.00	0.00	0.00	129.80	213.50	558.30	559.20	573.70
Bio gass (TJ)				102.26	116.59	120.39	107.74	113.78
Total fuel consumption (TJ)	12,190.9	9,506.6	12,053.9	10,957.7	10,014.1	10,443.2	11,939.6	10,335.3
Commercial/Institutional								
Emissions								
EF CO2 - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - anthracite (t/TJ)								
EF CO2 - brown coal (t/TJ)	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO2 - briquettes (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 - gas works gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - gasoline (t/TJ)								
EF CO2 - sub bit coal (t/TJ)								
EF CO2 - petroleum coke (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 - anthracite (t/TJ)	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30
EF CO2 - solid biomass wood (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
EF CO2 - landfill gas (t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO2 Emission (Gg)	854.65	640.93	789.25	690.73	614.15	639.86	722.20	633.52

Table A3-15: 1A4a– fuel consumption, NCV and emission factors, cont

EF CH4 - petroleum (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - anthracite (kg/TJ)								
EF CH4 - brown coal (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - lignite (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - briquettes (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - gasoline (kg/TJ)								
EF CH4 - sub bit coal(kg/TJ)								
EF CH4 - petroleum coke (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - anthracite (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 -solid biomass wood (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - landfill gas (t/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH4 Emission (Mg)	99.38	74.97	89.75	110.66	123.12	222.38	229.51	226.19
EF N2O - petroleum (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - anthracite (kg/TJ)								
EF N2O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gasoline (kg/TJ)								
EF N2O - sub bit coal(kg/TJ)								
EF N2O - petroleum coke (t/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - anthracite (t/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - solid biomass wood (kg/TJ)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - landfill gas (t/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	5.87	3.86	4.16	3.40	2.84	3.77	3.86	3.80

Table A3-16: 1A4b– fuel consumption, NCV and emission factors

Residential	1990	2000	2010	2015	2020	2021	2022
Fuel consumption							
Fuel consumption - mobile							
Gasoline (1000 t)	4.00	12.10	8.20	7.50	7.60	7.80	7.50
NCV for gasoline (MJ/kg)	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Fuel consumption - stationary							
Petroleum (1000 t)		1.60	0.90				
NCV for petroleum (MJ/kg)		43.96	43.96	43.96			
Light heating oil (1000 t)	215.90	231.50	138.80	84.50	58.20	42.30	56.10
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	48.70	8.10	10.40	4.30	0.00	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	97.90	51.90	72.20	47.60	40.90	41.00	37.50
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Brown coal (1000 t)	123.10	12.00	6.10	1.20	1.70	1.50	1.10
NCV for brown coal (MJ/kg)	16.74	17.80	17.60	17.00	18.43	18.50	18.50
Lignite (1000 t)	207.30	15.00	9.40	7.00	4.30	4.00	3.10
NCV for lignite (MJ/kg)	10.90	12.00	11.60	10.50	11.20	11.50	11.50
Hard coal (1000 t)							
NCV for hard coal (MJ/kg)							
Anthracite (1000 t)							
NCV for anthracite (MJ/kg)							
Briquettes (1000 t)	6.10						
NCV for briquettes (MJ/kg)	16.74						
Gas work gas (1000000 m3)	24.40	9.90	7.20	0.19			
NCV for gas work gas (MJ/m3)	15.82	19.49	17.20	17.10			
Natural gas (1000000 m3)	230.00	496.60	732.90	540.00	584.80	627.00	580.20
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.60	34.77	35.00	35.30
Solid Biomass-Wood (TJ)	42,170.0	39,690.0	49,539.0	48,622.7	42,763.0	46,453.4	42,071.6
Charcoal (TJ)	0.00	0.00	154.00				
Total fuel consumption (TJ)	70,745.6	70,417.3	85,088.7	73,752.1	67,918.4	72,549.1	67,097.5
Residential							
Emissions i+ii							
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - brown coal (t/TJ)-mrki	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO2 -hard coal (t/TJ)-kameni	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - anthracite (t/TJ)	98.30	98.30	98.30	98.30	98.30	98.30	98.30
EF CO2 - briquettes (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 - gas work gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - solid biomass wood (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00
EF CO2 - Charcoal (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00
CO2 Emission (Gg)	6,751.88	6,393.72	7,703.87	6,948.26	6,266.73	6,720.49	6,178.24

Table A3-16: 1A4b– fuel consumption, NCV and emission factors, cont.

EF CH4 - gasoline (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - petroleum (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - brown coal (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - lignite (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - hard coal (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - anthracite (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - briquettes (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - gas work gas (t/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 -solid biomass wood (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 -Charcoal (kg/TJ)	200.00	200.00	200.00	200.00	200.00	200.00	200.00
CH4 Emission (Mg)	14,155.3	12,230.9	15,167.1	14,760.7	12,992.2	14,099.0	12,776.8
EF N2O - gasoline (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - petroleum (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - hard coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - anthracite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - gas work gas (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - solid biomass wood (kg/TJ)	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - Charcoal (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
N2O Emission (Mg)	183.95	168.07	205.70	199.20	175.09	189.60	172.23

Table A3-17: 1A4c– fuel consumption, NCV and emission factors

Agriculture/forestry/fishing	1990	2000	2005	2010	2015	2020	2021	2022
Fuel consumption								
Other kerosene (1000 t)	0.10							
NCV for other kerosene (MJ/kg)	43.94							
Diesel + light heating oil (1000 t)	232.60	237.60	197.40	200.10	182.60	193.40	192.00	197.90
NCV for diesel (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel consumption - mobile (TJ)	9,938.7	10,147.9	8,431.0	8,546.3	7,798.8	8,260.1	8,200.3	8,452.3
Fuel oil (1000 t)	12.30	13.40	4.70	4.40	2.10	0.00	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.40	2.60	2.70	2.70	2.50	2.70	2.70	2.30
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Gas work gas (1000000 m3)								
NCV for gas work gas (MJ/m3)								
Natural gas (1000000 m3)	25.00	14.50	23.20	22.20	21.40	30.30	36.30	30.30
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.60	34.77	35.00	35.30
Fuel consumption - stationary (TJ)	1,550.7	1,153.5	1,104.3	1,058.2	942.1	1,180.1	1,397.1	1,177.4
Total fuel consumption (TJ)	11,489.4	11,301.4	9,535.3	9,604.5	8,740.9	9,440.2	9,597.4	9,629.7
Agriculture/forestry/fishing								
Emissions								
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - other kerosene (t/TJ)	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO2 emission (Gg) - mobile	736.45	751.96	624.73	633.28	577.89	612.07	607.64	626.32
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas work gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 emission (Gg) - stationary	98.97	77.03	66.86	64.02	55.47	67.09	79.26	66.81
Total CO2 emission (Gg)	835.42	828.99	691.59	697.30	633.36	679.17	686.91	693.13
EF CH4 - gasoline (kg/TJ)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
EF CH4 - other kerosene (kg/TJ)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
EF CH4 - diesel (kg/TJ)	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
CH4 emission (Mg) - mobile	41.84	42.11	34.99	35.47	32.37	34.28	34.03	35.08
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH4 emission (Mg) - stationary	10.22	8.46	6.47	6.18	5.13	5.90	6.99	5.89
Total CH4 emission (Mg)	52.07	50.57	41.45	41.64	37.50	40.18	41.02	40.96
EF N2O - gasoline (kg/TJ)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
EF N2O - other kerosene (kg/TJ)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
EF N2O - diesel (kg/TJ)	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60
N2O emission (Mg) - mobile	284.12	290.23	241.13	244.42	223.05	236.24	234.53	241.74
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O emission (Mg) - stationary	0.40	0.38	0.20	0.19	0.14	0.12	0.14	0.12
Total N2O emission (Mg)	284.53	290.61	241.33	244.62	223.18	236.36	234.67	241.85

Table A3-18: 1B1 –coal production data and CH4 emissions

		STEP 1										
		A	B	C	D	E						
		Amount of Coal Produced	Emission Factor	Methane Emissions	Conversion Factors	Methane Emissions						
		(millions t)	(m ³ CH ₄ / t)	(millions m ³)	(0.67 Gg / million m ³)	(Gg CH ₄)						
				C=(AxB)								
						E=(CxD)						
Underground Mines	Mining	0.1737	18	3.13	0.67	2.09						
	Post-Mining	0.1737	2.5	0.43	0.67	0.29						
Surface Mines	Mining			0.00	0.67	0.00						
	Post-Mining			0.00	0.67	0.00						
						Total	2.39					
ZA CRF		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fuel produced	Mt	0.173700000	0.154797	0.120274	0.1151	0.103205	0.0822	0.0663	0.0485	0.0508	0.0153	NO
Emission												
CH ₄ , Gg	Mining	2.094822	1.86685182	1.45050444	1.388106	1.2446523	0.991332	0.799578	0.58491	0.612648	0.184518	NO
	Post-Mining	0.2909475	0.25928498	0.20145895	0.1927925	0.17286838	0.137685	0.111053	0.081238	0.08509	0.025628	NO
TOTAL		2.3857695	2.1261368	1.65196339	1.5808985	1.41752068	1.129017	0.910631	0.666148	0.697738	0.210146	NO

Table A3-19: 1B2a –activity data and emission factors for oil

1. B. 2. a. Oil				1990	2000	2005	2010	2015	2020	2021	2022
1. Exploration	Unit	Emission source	IPCC Code								
ACTIVITY DATA											
Well Drilling	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
EMISSION FACTOR											
CO2											
Well Drilling	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06
CH4											
Well Drilling	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04
N2O											
Well Drilling	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND
2. Production											
ACTIVITY DATA											
Conventional oil	10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
Conventional oil	10 ³ m ³ total oil production	Venting	1.B.2.a.i	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
EMISSION FACTOR											
CO2											
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02
CH4											
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N2O											
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07
3. Transport											
ACTIVITY DATA											
Pipelines	10 ³ m ³ total oil transported by pipelines	All	1.B.2.a.iii.3	9948.84	5552.33	8244.19	10390.70	9490.70	10759.30	10648.84	10726.74
Tanker Trucks and Rail	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	275.30	273.51	124.13	50.01066	54.994852	28.874954	40.512385
Natural gas liquids transport-LPG	10 ³ m ³ LPG	All	1.B.2.a.iii.3								
EMISSION FACTOR											
CO2											
Pipelines	Gg/10 ³ m ³ total oil transported	All	1.B.2.a.iii.3	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07
Tanker Trucks and Rail	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06
CH4											
Pipelines	Gg/10 ³ m ³ total oil transported	All	1.B.2.a.iii.3	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06
Tanker Trucks and Rail	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N2O											
Pipelines	Gg/10 ³ m ³ total oil transported	All	1.B.2.a.iii.3	NA	NA	NA	NA	NA	NA	NA	NA
Tanker Trucks and Rail	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA
4. Refining/Storage											
ACTIVITY DATA											
Oil Refining	10 ³ m ³ oil refined	All	1.B.2.a.iii.4	7977.5581	6120.6977	5803.6047	3769.186	3328.372	2311.5116	2164.535	2043.953
EMISSION FACTOR											
CO2											
Oil Refining	Gg/10 ³ m ³ total oil refined	All	1.B.2.a.iii.4	ND	ND	ND	ND	ND	ND	ND	ND
CH4											
Oil Refining	Gg/10 ³ m ³ total oil refined	All	1.B.2.a.iii.4	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05
N2O											
Oil Refining	Gg/10 ³ m ³ total oil refined	All	1.B.2.a.iii.4	ND	ND	ND	ND	ND	ND	ND	ND

Table A3-20: 1B2b –activity data and emission factors for natural gas

1. B. 2. b. Natural Gas				1990	2000	2005	2010	2015	2020	2021	2022
1. Exploration	Unit	Emission source IPCC Code									
ACTIVITY DATA											
Well Drilling	10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
Well Testing	10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
Well Servicing	10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
EMISSION FACTOR											
CO2											
Well Drilling	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
Well Testing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
CH4											
Well Drilling	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
Well Testing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
N2O											
Well Drilling	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND
Well Testing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10 ⁶ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND
2. Production	Unit	Emission source IPCC Code									
ACTIVITY DATA											
Gas production	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1982.30	1658.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
EMISSION FACTOR											
CO2											
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03
CH4											
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07
N2O											
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	NA	NA	NA	NA	NA	NA	NA	NA
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing	Unit	Emission source IPCC Code									
ACTIVITY DATA											
Default weighted total	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1982.30	1658.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
Default weighted total	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
Default weighted total	10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.b.i	1982.30	1658.50	2283.40	2727.20	1780.50	849.00	745.90	745.00
EMISSION FACTOR											
CO2											
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.b.i	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CH4											
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA
N2O											
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	NA	NA	NA	NA	NA	NA	NA	NA
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.3E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA
4. Transmission and storage	Unit	Emission source IPCC Code									
ACTIVITY DATA											
Transmission	10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2686.6	2704.8	2909.9	3241.5	2519.2	3040.7	2905.9	2529.7
Transmission	10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	2686.6	2704.8	2909.9	3241.5	2519.2	3040.7	2905.9	2529.7
Storage	10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2686.6	2704.8	2909.9	3241.5	2519.2	3040.7	2905.9	2529.7
EMISSION FACTOR											
CO2											
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07
CH4											
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N2O											
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	ND	ND	ND	ND	ND	ND	ND	ND
5. Distribution of Natural Gas	Unit	Emission source IPCC Code									
ACTIVITY DATA											
Gas distribution	10 ⁶ m ³ of utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	609.3	862.2	944.6	766.2	851	942	842.5
EMISSION FACTOR											
CO2											
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05
CH4											
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03
N2O											
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND

Table A3-21: 1B2c –activity data and emission factors for venting and flaring

1. B. 2. a. Oil				1990	2000	2005	2010	2015	2020	2021	2022	
2. Production		Unit	mission source	IPCC Code								
ACTIVITY DATA												
	Conventional oil	10 ⁹ m ³ total oil production	Flaring	I.B.2.a.ii	3135.12	1411.51	1100.00	837.67	779.30	734.65	702.91	679.07
EMISSION FACTOR												
N2O												
	Conventional oil	Gg/10 ⁹ m ³ total oil production	Fugitives (Onshore)	I.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA
	Conventional oil	Gg/10 ⁹ m ³ total oil production	Venting	I.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA
	Conventional oil	Gg/10 ⁹ m ³ total oil production	Flaring	I.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07
3. Transport		Unit	mission source	IPCC Code						2020	2021	2022
ACTIVITY DATA												
	Pipelines	10 ⁹ m ³ total oil transported by pipelines	All	I.B.2.a.iii.3	9948.84	5552.33	8244.19	10390.70	9490.70	10759.30	10648.84	10726.74
	Tanker Trucks and Rail Cars	10 ⁹ m ³ total oil transported by tanker...	Venting	I.B.2.a.i	943.49	275.30	273.51	124.13	50.01	54.99	28.87	40.51
	Natural gas liquids transport-LPG	10 ⁹ m ³ LPG	All	I.B.2.a.iii.3								
EMISSION FACTOR												
CO2												
	Tanker Trucks and Rail Cars	Gg/10 ⁹ m ³ total oil transported	Venting	I.B.2.a.i	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06
	Tanker Trucks and Rail Cars	Gg/10 ⁹ m ³ total oil transported	Venting	I.B.2.a.i	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N2O												
	Tanker Trucks and Rail Cars	Gg/10 ⁹ m ³ total oil transported	Venting	I.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA

1. B. 2. c. 2 ii Venting and Flaring - Gas				1990	2000	2010	2015	2020	2021	2022	
2. Production		Unit	mission source	IPCC Code							
ACTIVITY DATA											
	Gas production	10 ⁶ m ³ gas produced	Flaring	I.B.2.b.ii	1982.30	1658.50	2727.20	1780.50	849.00	745.90	745.00
EMISSION FACTOR											
	Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	I.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing		Unit	mission source	IPCC Code							
ACTIVITY DATA											
	Default weighted total	10 ⁶ m ³ gas produced	Flaring	I.B.2.b.ii	1982.30	1658.50	2727.20	1780.50	849.00	745.90	745.00
EMISSION FACTOR											
N2O											
	Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	I.B.2.b.ii	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
4. Transmission and storage		Unit	mission source	IPCC Code							
ACTIVITY DATA											
	Transmission	10 ⁶ m ³ marketable gas	Fugitives	I.B.2.b.iii.4	2686.6	2704.8	3241.5	2519.2	3040.7	2905.9	2529.7
EMISSION FACTOR											
N2O											
	Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	I.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA
5. Distribution of Natural Gas		Unit	mission source	IPCC Code							
ACTIVITY DATA											
	Gas distribution	10 ⁶ m ³ of utility sales (consumption of natural gas in 1A4-Other sectors)	All	I.B.2.a.iii.5	379.3	609.3	944.6	766.2	851	942	842.5
EMISSION FACTOR											
N2O											
	Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	I.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND

3.2. LULUCF sector - List of implemented and planned projects

Table A3.2-1: Implemented and planned projects in LUULCF sector

Project	Status	Main objectives
Improving Croatian reporting in Land use, Land Use change and Forestry (LULUCF) sector in the First commitment period of the Kyoto Protocol (abbreviated LULUCF 1).	Implemented (2014-2015)	The objective of the project was to comply with requirements set in the Saturday paper in 2012 regarding the traceability and identification of lands that were subject of forest activities (lands under the Article 3.3 and Article 3.4 of the KP). The main tasks of the project were: (i) identification of areas where an increase of forests occurred prior to 1990, which were a result of man's decision to support the natural spread of forests on the categories of land that haven't been forests before; (ii) identification of areas where an increase of forests occurred after 1990, which were a result of man's decision to support the natural spread of forests on the categories of land that haven't been forests before; (iii) identification of areas where an increase of forests occurred after the 1990, which were not the result of a man's decision to support the natural spread of forests to categories of land that haven't been forests before; (iv) identification of land that were subject of deforestation in period 1990-2014; The main outcome was the application of Approach 3 to identify and trace lands that are converted to and from forest lands. Registration system of LUC to/from forest land has been kept after the end of the project.
Upgrading the Croatian National System for the reporting of greenhouse gas emissions for the implementation of the Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities (abbreviated: LULUCF 2)	Implemented (2014-2015)	The main objective of the project was to improve national NIR reporting estimates of the emissions/removals from LULUCF sector. Project activities referred to the setting the preconditions for the development of a future land cover and land use information system as well as improvements in reporting system procedures.
The analysis of the national forest inventory data for fulfilling obligations under the UN Framework Convention on Climate Change and the Kyoto Protocol.	Implemented (2016)	The objective of the project was to analyse and discuss the importance and usability of data collected during National Forest Inventories (NFI) in fulfilment of national obligations set under the UN Framework Convention on climate change, Kyoto Protocol and according to the Decision No 529/2013/EU of the European Parliament and of the Council. One of the main outcomes was the international workshop that had been organized to exchange information, experience and knowledge among experts from EU member states on these data issues for the purpose of future planning in forestry sector and reporting from LULUCF sector.
Calculation of greenhouse gas emissions due to natural disturbances under the provisions of Decision 2/CMP.7	Implemented (2016-2017)	The main goal of the project was to determine types of the natural disturbances for the forests in Croatia and to define background level (BL) and margin level (ML) in areas under the forest management activity (FM) and afforestation activity (A).
Application of the IPCC Tier 2 method for the estimation of the carbon stock change in dead wood pool on the deforested areas in Republic of Croatia.	Implemented (2018)	The use of data from the national forest inventory databases (abbreviated: CRONFI) to perform the estimation of carbon stock changes in the deadwood pool using a higher level (Tier 2) of the IPCC methodology for the forest land areas that had been converted to perennial cropland and settlements (areas subject of deforestation).

Project	Status	Main objectives
Application of the IPCC Tier 2 method for the estimation of the greenhouse gases emissions from forest fires.	Implemented (2019-2020)	The assessment of the biomass structure on the burnt areas in order to develop national specific values of the M_B and C_f factors for the application of a higher level (Tier 2) of the IPCC methodology for calculating GHG emissions as a result of biomass burning in Croatia.
Croatian Land Information System (abbreviated: CROLIS).	Ongoing (2020-2024)	The aim of the project is a development of harmonized land monitoring system that enables integration and processing of Land Cover (LC), Land Use (LU) and land management data from different data sources and its use for a variety of purposes.
New uncertainty estimates in LULUCF sector	Implemented (2021-2022)	The aim of the project was to perform new uncertainty estimates in LULUCF sector.
Defining preconditions for applying IPCC higher Tiers in the estimation of GHG removals/emissions in Land use, land use change and forestry (LULUCF) sector (LULUCF 3)	Implemented (2020-2022)	The aim of the project was an examination and the review of the existing systems for determining the content of carbon stocks in biomass in the category of Forest land as well as in the categories of land that have been converted into forest land (Cropland and Grassland). Also, it is envisaged to define preconditions for the development of the appropriate models on national level for the future reporting.
Strengthening the capacity to make projections in the LULUCF sector (LULUCF projections project).	Implemented (2021-2023)	The aim of the project was to define the basic settings and preconditions on national level for the preparation of projections of emissions / removals by sink in the LULUCF sector (period up to 2030, 2050) and related activities.
Determining the deadwood pool carbon stocks based on new surveys at 2006 deadwood sampling sites.	Ongoing (2022-2024)	Through this project the carbon stock change in dead wood pool in category Forest land remaining Forest land needs to be determined.
Conducting analysis to determine the possibility of increasing removals by sinks and reducing emissions in LULUCF sector.	Implemented (2021-2024)	Defining management practices that will contribute to reducing emissions/increasing removals in Forest land, Grassland and Cropland categories of land.
Develop country-specific factors for BEFs.	Planned (in the long-term)	Develop country specific BEFs for Forest land category.
Establishing a reporting system for hard wood products (HWP) (abbreviated: CRO-WOODS).	Ongoing	The aim of the project is to define preconditions for the development of an information system on wood products (monitoring of the entire production cycle, final product production, export) and to define the national factors needed to calculate carbon stock changes in wood products using the Tier 3 level of IPCC methodology for the NIR report purposes in the part related to the calculation for HWPs.
Tier 3 application for CSC in dead wood in deforested areas.	Planned (in the long term)	The aim of this project is to develop model to apply Tier 3 in estimating CSC in DW pool on deforested areas in Croatia using the CRONFI data.

3.3. QA/QC checks conducted by EEA

Below is evidence of the QA / QC actions carried out at EU level by the EEA after the NIR has been submitted to EK.

The screenshot shows the EIONET Central Data Repository interface. The top navigation bar includes the EEA logo, a 'Logout (obucfat)' button, and a 'Eionet portal' link. The main header displays 'EIONET Central Data Repository'. Below this, a breadcrumb trail indicates the current page: 'You are here: Eionet > CDR > Croatia > European Union (EU) obligations > Greenhouse gas Monitoring Mechanism Regulation (MMR) > Art. 05 & 07 and UNFCCC - Greenhouse gas inventories > GHG inventories > NIR_2021_15_03 > AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: GHG crf QA v1.9'. A 'Back to envelope' button is located in the top right corner of the content area.

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Subscribe to receive notifications if you want to stay updated about events in this site.

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The Eionet password expires two years after it was last changed.

Feedback: AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: GHG crf QA v1.9

Subject: AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: GHG crf QA v1.9
Posted automatically on: 15 Mar 2021 09:35
Task: Automatic quality assessment
Referred file: [HRV_2021_1_04032021_152549477527459380447287.xml](#)
Attached files: qa-output [\[download\]](#)
Feedback status: WARNING
Feedback message: This XML file generated non-blocking warnings

Feedback too large for inline display, see attachment.

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The screenshot shows the EIONET Central Data Repository interface. The top navigation bar includes the EEA logo, a 'Logout (obucfat)' button, and a 'Eionet portal' link. The main header displays 'EIONET Central Data Repository'. Below this, a breadcrumb trail indicates the current page: 'You are here: Eionet > CDR > Croatia > European Union (EU) obligations > Greenhouse gas Monitoring Mechanism Regulation (MMR) > Art. 05 & 07 and UNFCCC - Greenhouse gas inventories > GHG inventories > NIR_2021_15_03 > AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: XML Schema validation'. A 'Back to envelope' button is located in the top right corner of the content area.

Services

- Search by obligation
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Feedback: AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: XML Schema validation

Subject: AutomaticQA result for file HRV_2021_1_04032021_152549477527459380447287.xml: XML Schema validation
Posted automatically on: 15 Mar 2021 09:30
Task: Automatic quality assessment
Referred file: [HRV_2021_1_04032021_152549477527459380447287.xml](#)
Feedback status: INFO
Feedback message: XML Schema validation passed without errors.

XML Schema validation

OK XML Schema validation passed without errors.
The file was validated against http://schemas.unfccc.int/inventoryreporting/simple1_9.xsd

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Checked XML file: http://cdr.eionet.europa.eu/hr/eur/mmr/art07_inventory/ghg_inventory/envye8xdq/HRV_2021_1_04032021_152549477527459380447267.xml

The envelope is attached to the following obligations:
<http://rod.eionet.europa.eu/obligations/701>
<http://rod.eionet.europa.eu/obligations/102>

Greenhouse gas inventories automatic checks

Two distinct checks have been applied:

IPCC variables check: variables for which "IPCC methods" are available are listed under column "IPCC" in case the notation key "NE" (not estimated) is reported for the inventory year 2019; or are listed under column "Not provided" in case the variable is not reported for the inventory year 2019;

Identical emissions check: [emissions variables](#) are listed if the difference between two reported numeric values for inventory year 2018 and inventory year 2019 is "zero".

1	IPCC variables check:	113	Show records
2	Identical emissions check:	33	Show records

For any questions you may contact eea-inventories@eea.europa.eu

Annex 4: The national energy balance for the most recent inventory year

Table A4-1: National Energy balance for 2022, natural units

ENERGY BALANCE 2021 natural units	Anthracite 103 t	Hard coal 103 t	Brown coal 103 t	Lignite 103 t	Crude oil 103 t	Natural gas 106 m ³
Production					584.0	745.0
Import	4.4	643.9	4.2	3.7	1473.9	3021.5
Export		4.2			202.4	1062.0
Import-processing						
Export-processing						
Stock change		-8.1			-61.7	-174.8
Bunkers						
Energy supplied	4.4	631.6	4.2	3.7	1793.8	2529.7
Production						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants						
public cogeneration plants						
public heating plants						
industrial cogeneration plants						
– in refineries						
– in gas production						
Industrial heating plants						
Petroleum refineries						
NGL-plant						
Coke plant						
Gas works						
Total production						
Transformation sector						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants		550.4				7.6
public cogeneration plants						833.3
public heating plants						45.2
industrial cogeneration plants						145.7
– in refineries						25.9
– in gas production						52.3
Industrial heating plants						86.7
Petroleum refineries					1757.8	65.1
NGL-plant					36.0	7.2
Coke plant						
Gas works						
Total transformation sector		550.4			1793.8	1190.8
Energy sector own use						
Oil and gas extraction						59.7
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						25.7
NGL-plant						42.8
Gas works						
Total energy sector own use						128.2
Losses						45.2
Final energy demand	4.4	81.2	4.2	3.7		1165.5
Non energy use						61.5
Energy sector						
Petrochemical industry						61.5
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	4.4	81.2	4.2	3.7		1104.0
Industry	4.4	81.2	3.1	0.6		257.2
Iron and steel	4.3					19.6
Non-ferrous metals						13.6
Non-metallic minerals						51.6
Chemical			0.5			8.7
Construction materials		81.2	2.6			62.5
Pulp and paper						10.1
Food production	0.1			0.6		48.8
Not elsewhere specified						42.3
Transport						4.3
Rail						
Road						
Air						
– international						
– domestic						
Sea and River						
Public transport						4.3
Not elsewhere specified						
Other sectors			1.1	3.1		842.5
Households			1.1	3.1		580.2
Services						232.0
Agriculture						30.3
Construction						

Table A4-1: National Energy balance for 2022, natural units, cont.

ENERGY BALANCE 2021 natural units	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
	TJ	103 m3	TJ	TJ	TJ	103 m3	103 t	TJ
Production	49312.0	4883.6	18913.7	2016.3	1726.1	199395.0	0.4	24184.1
Import		97.2					14.8	909.9
Export		567.8						5582.9
Import-processing								
Export-processing								
Stock change							8.9	-160.5
Bunkers								
Energy supplied	49312.0	4413.0	18913.7	2016.3	1726.1	199395.0	24.1	19350.6
Production								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in refineries								
– in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Transformation sector								
hydro power plants	49312.0							
– small HPP	1092.6							
Wind power plants			18913.7					
Solar power plants				1343.9				
Geothermal power plants					1527.8			
thermal power plants						19620.0		
public cogeneration plants						172001.0		13289.3
public heating plants								17.0
industrial cogeneration plants						7774.0		
– in refineries								
– in gas production								
Industrial heating plants								154.1
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	49312.0		18913.7	1343.9	1527.8	199395.0		13460.4
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Wind power								
Petroleum refineries								
NGL-plant								
Gas works								
Total energy sector own use								
Losses								
Final energy demand		4413.0		672.4	198.3		24.1	5890.2
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		4413.0		672.4	198.3		24.1	5890.2
Industry		33.8					0.2	2657.7
iron and steel		0.1						9.9
Non-ferrous metals								0.5
Non-metallic minerals								0.3
Chemical								2018.5
Construction materials		5.7						65.4
Pulp and paper		4.3						228.9
Food production		1.9						334.2
Not elsewhere specified		21.8					0.2	
Transport							23.9	
Rail								
Road							23.9	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		4379.2		672.4	198.3			3232.5
Households		4367.0		470.7				2768.6
Services		12.2		201.7	108.3			463.9
Agriculture					90.0			
Construction								

Table A4-1: National Energy balance for 2022, natural units, cont.

ENERGY BALANCE 2021 natural units	Coke oven coke	Liquefied petroleum	Unloaded motor	Standard motor	Petroleum	Jet fuel	Diesel oil	Light heating oil	Low sulphur fuel	Standard fuel oil
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production		150.9	498.8			149.7	813.1	151.5	128.8	145.2
Import	31.1	169.5	186.1	0.5	1.0	36.1	2053.8	8.3	4.4	
Export		215.7	217.1	0.1		1.4	871.0	22.6	118.6	80.9
Import-processing										
Export-processing										
Stock change	1.6	-0.8	7.4			0.5	-76.6	2.5	-1.0	3.1
Bunkers							11.9		7.0	
Energy supplied	32.7	103.9	475.2	0.4	1.0	184.9	1907.4	139.7	6.6	67.4
Production										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants										
public cogeneration plants										
public heating plants										
industrial cogeneration plants										
– in refineries										
– in gas production										
Industrial heating plants										
Petroleum refineries		120.6	498.8			149.7	813.1	151.5	128.8	145.2
NGL-plant		30.3								
Coke plant										
Gas works										
Total production		150.9	498.8			149.7	813.1	151.5	128.8	145.2
Transformation sector										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								9.9		
public cogeneration plants								5.4		
public heating plants								4.3	0.6	
industrial cogeneration plants										53.6
– in refineries										53.6
– in gas production										
Industrial heating plants										7.0
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								19.6	0.6	60.6
Energy sector own use										
Oil and gas extraction										
Coal production										
Electric energy supply industry										
hydro power plants										
thermal power plants										
public cogeneration plants										
industrial cogeneration plants										
Wind power										
Petroleum refineries										5.5
NGL-plant										
Gas works										
Total energy sector own use										5.5
Losses										
Final energy demand	32.7	103.9	475.2	0.4	1.0	184.9	1907.4	120.1	6.0	1.3
Non energy use										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	32.7	103.9	475.2	0.4	1.0	184.9	1907.4	120.1	6.0	1.3
Industry	32.7	6.2	0.2		1.0		9.9	22.3	6.0	1.3
Iron and steel	0.2	2.3					0.3	1.0		
Non-ferrous metals		0.8					0.2	0.4		
Non-metallic minerals		0.3					0.1			
Chemical					1.0			0.9		
Construction materials	30.2	0.6	0.1				7.5	5.0	2.1	0.4
Pulp and paper		0.1						0.1		
Food production	2.3	1.3					0.2	10.3	3.9	0.9
Not elsewhere specified		0.8	0.1				1.6	4.6		
Transport		46.4	464.1	0.4		184.9	1598.2			
Rail							14.7			
Road		46.4	464.1				1514.7			
Air				0.4		184.9				
– international						177.1				
– domestic				0.4		7.8				
Sea and River								48.3		
Public transport								20.5		
Not elsewhere specified										
Other sectors		51.3	10.9				299.3	97.8		
Households		37.5						56.1		
Services		8.6						24.7		
Agriculture		2.3	7.5					186.4	11.5	
Construction		2.9	3.4					112.9	5.5	

Table A4-1: National Energy balance for 2022, natural units, cont.

ENERGY BALANCE 2021 natural units	Na phta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production	29.6			9.0		20.1		117.9
Import		4.0	131.1	43.6	7.2	139.4		
Export	18.2	1.7	3.6	14.0	0.3	10.0		95.8
Import-processing								
Export-processing								
Stock change	-2.6			-0.5		-19.9		-22.1
Bunkers								
Energy supplied	8.8	2.3	127.5	38.1	6.9	129.6		0.0
Production								
hydro power plants								
- small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
- in refineries								
- in gas production								
Industrial heating plants								
Petroleum refineries	14.0			9.0		20.1		117.9
NGL-plant	15.6							
Coke plant								
Gas works								
Total production	29.6			9.0		20.1		117.9
Transformation sector								
hydro power plants								
- small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
- in refineries								
- in gas production								
Industrial heating plants								
Petroleum refineries	8.8							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	8.8							
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Wind power								
Petroleum refineries						19.7		
NGL-plant								
Gas works								
Total energy sector own use						19.7		
Losses								
Final energy demand	0.0	2.3	127.5	38.1	6.9	109.9		0.0
Non energy use								
Energy sector		2.3	127.5	37.8	6.9			
Petrochemical industry				1.8				
Other industry		2.3	14.5	9.8	6.7			
Construction			113.0	1.3				
Transport				23.8				
Agriculture				1.1				
Energy consumption	0.0			0.3		109.9		0.0
Industry								
Iron and steel						109.9		
Non-ferrous metals						0.1		
Non-metallic minerals								
Chemical								
Construction materials						109.8		
Pulp and paper								
Food production								
Not elsewhere specified								
Transport								
Rail				0.3				
Road				0.2				
Air								
- international								
- domestic								
Sea and River				0.1				
Public transport								
Not elsewhere specified								
Other sectors								
Households								
Services								
Agriculture								
Construction								

Table A4-1: National Energy balance for 2022, natural units, cont.

ENERGY BALANCE 2021 <i>natural units</i>	Refinery gas 103 t	Refinery semiproducts 103 t	Additives 103 t	Gas works gas 103 m3	Electricity GWh	Steam and hot water TJ	Industrial waste, non TJ
Production	87.6				14220.5	22971.9	1935.0
Import		454.9	43.4		5336.2		
Export					641.4		
Import-processing							
Export-processing							
Stock change		-2.8					
Bunkers							
Energy supplied	87.6	452.1	43.4		18915.3	22971.9	1935.0
Production							
hydro power plants					5573.7		
- small HPP					123.5		
Wind power plants					2137.8		
Solar power plants					151.9		
Geothermal power plants					72.7		
thermal power plants					1658.3		
public cogeneration plants					4345.1	12857.7	
public heating plants						1556.3	
industrial cogeneration plants					281.0	5027.3	
- in refineries					62.7	2730.0	
- in gas production					133.2	520.0	
Industrial heating plants						2939.4	
Petroleum refineries	87.6						
NGL-plant							
Coke plant							
Gas works							
Total production	87.6				14220.5	22380.7	
Transformation sector							
hydro power plants							
- small HPP							
Wind power plants							
Solar power plants							
Geothermal power plants							
thermal power plants							
public cogeneration plants							
public heating plants							
industrial cogeneration plants	10.8						
- in refineries	10.8						
- in gas production							
Industrial heating plants							
Petroleum refineries		452.1	43.4				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	10.8	452.1	43.4				
Energy sector own use							
Oil and gas extraction					114.0	427.0	
Coal production						343.0	
Electric energy supply industry					15.4		
hydro power plants					210.3		
thermal power plants					147.6		
public cogeneration plants					292.7	1612.2	
industrial cogeneration plants							
Wind power					22.3		
Petroleum refineries	76.8				163.4	3155.5	
NGL-plant					56.7	93.0	
Gas works							
Total energy sector own use	76.8				1022.4	5630.7	
Losses					1659.3	1683.5	
Final energy demand		0.0			16233.6	15657.7	1935.0
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption		0.0			16233.6	15657.7	1935.0
Industry					3330.6	8104.4	1935.0
Iron and steel					442.0	31.3	6.0
Non-ferrous metals					108.0		
Non-metallic minerals					151.7	8.8	
Chemical					186.9	1238.2	
Construction materials					581.5	0.5	1929.0
Pulp and paper					115.1	1253.2	
Food production					657.8	2478.3	
Not elsewhere specified					1087.6	3094.1	
Transport					343.4		
Rail					183.8		
Road					12.2		
Air					35.2		
- international							
- domestic					35.2		
Sea and River					19.6		
Public transport					58.2		
Not elsewhere specified					34.4		
Other sectors					12559.6	7553.3	
Households					6464.3	5212.1	
Services					5851.1	2022.9	
Agriculture					148.5	318.3	
Construction					95.7		

Table A4-2: National Energy balance for 2022, energy units

<i>PI</i>	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production					24.820	26.633
Import	0.129	16.127	0.078	0.043	62.641	106.659
Export		0.105			8.602	37.489
Import-processing						
Export-processing						
Stock change		-0.203			-2.622	-6.170
Bunkers						
Energy supplied	0.129	15.819	0.078	0.043	76.237	89.632
<i>Production</i>						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants						
public cogeneration plants						
public heating plants						
industrial cogeneration plants						
– in refineries						
– in gas production						
Industrial heating plants						
Petroleum refineries						
NGL-plant						
Coke plant						
Gas works						
Total production						
Gross production	0.129	15.819	0.078	0.043	76.237	89.632
<i>Transformation sector</i>						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants		13.644				0.268
public cogeneration plants						29.415
public heating plants						1.596
industrial cogeneration plants						5.143
– in refineries						0.914
– in gas production						1.846
Industrial heating plants						3.061
Petroleum refineries					74.707	2.298
NGL-plant					1.530	0.588
Coke plant						
Gas works						
Total transformation sector		13.644			76.237	42.369
<i>Energy sector own use</i>						
Oil and gas extraction						2.107
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Industrial heating plants						
Petroleum refineries						0.907
NGL-plant						1.511
Gas works						
Total energy sector own use						4.525
Losses						1.596
Final energy demand	0.129	2.175	0.078	0.043		41.142
Non energy use						2.171
Energy sector						
Petrochemical industry						2.171
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	0.129	2.175	0.078	0.043		38.971
Industry	0.129	2.175	0.057	0.007		9.079
Iron and steel	0.126					0.692
Non-ferrous metals						0.480
Non-metallic minerals						1.821
Chemical			0.009			0.307
Construction materials		2.175	0.048			2.206
Pulp and paper						0.357
Food production	0.003			0.007		1.723
Not elsewhere specified						1.493
Transport						0.152
Rail						
Road						
Air						
– international						
– domestic						
Sea and River						
Public transport						0.152
Not elsewhere specified						
Other sectors			0.020	0.036		29.740
Households			0.020	0.036		20.481
Services						8.190
Agriculture						1.070
Construction						

Table A4-2: National Energy balance for 2022, energy units, cont.

<i>EU</i>	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
Production	49.312	43.952	18.914	2.016	1.726	3.799	0.015	24.184
Import		0.875					0.544	0.910
Export		5.110						5.583
Import-processing								
Export-processing								
Stock change							0.327	-0.161
Bunkers								
Energy supplied	49.312	39.717	18.914	2.016	1.726	3.799	0.886	19.351
<i>Production</i>								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in refineries								
– in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Gross production	49.312	39.717	18.914	2.016	1.726	3.799	0.886	19.351
<i>Transformation sector</i>								
hydro power plants	49.312							
– small HPP	1.093							
Wind power plants			18.914					
Solar power plants				1.344				
Geothermal power plants					1.528			
thermal power plants							0.336	
public cogeneration plants							3.305	13.289
public heating plants								0.017
industrial cogeneration plants							0.158	
– in refineries								
– in gas production								
Industrial heating plants								0.154
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	49.312		18.914	1.344	1.528	3.799		13.460
						335.900		
<i>Energy sector own use</i>								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Gas works								
Total energy sector own use								
Losses								
Final energy demand		39.717		0.672	0.198	0.000	0.886	5.890
<i>Non energy use</i>								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		39.717		0.672	0.198	0.000	0.886	5.890
Industry		0.304					0.007	2.658
Iron and steel		0.001						0.010
Non-ferrous metals								
Non-metallic minerals								0.001
Chemical								0.000
Construction materials		0.051						2.019
Pulp and paper		0.039						0.065
Food production		0.017						0.229
Not elsewhere specified		0.196					0.007	0.334
Transport							0.879	
Rail								
Road							0.879	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		39.413		0.672	0.198			3.233
Households		39.303		0.471				2.769
Services		0.110		0.202	0.108			0.464
Agriculture					0.090			
Construction								

Table A4-2: National Energy balance for 2022, energy units, cont.

<i>PI</i>	Coke oven coke	Liquefied petroleum gases	Unleaded motor gasoline	Standard motor gasoline	Petroleum	Jet fuel	Diesel oil	Light heating oil	Low sulphur fuel oil	Standard fuel oil
Production	195.371									
Import	188.005	0.912	7.948	8.298	0.022	0.044	1.587	87.718	0.354	0.177
Export	56.889		10.114	9.680	0.004		0.062	37.200	0.965	4.767
Import-processing										
Export-processing										
Stock change	-8.829	0.047	-0.038	0.330			0.022	-3.272	0.107	-0.040
Bunkers								0.508		0.281
Energy supplied	317.659	0.958	-2.204	-1.052	0.018	0.044	1.547	46.738	-0.504	-4.911
<i>Production</i>										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants										
public cogeneration plants										
public heating plants										
industrial cogeneration plants										
– in refineries										
– in gas production										
Industrial heating plants										
Petroleum refineries			5.655	22.241			6.581	34.728	6.471	5.176
NGL-plant			1.421							
Coke plant										
Gas works										
Total production			7.076	22.241			6.581	34.728	6.471	5.176
Gross production	317.659	0.958	4.872	21.189	0.018	0.044	8.128	81.465	5.967	0.265
<i>Transformation sector</i>										
hydro power plants	49.212									
– small HPP	1.093									
Wind power plants	18.914									
Solar power plants	1.344									
Geothermal power plants	1.528									
thermal power plants	14.249								0.423	
public cogeneration plants	46.010								0.231	
public heating plants	1.613								0.184	0.024
industrial cogeneration plants	5.301									
– in refineries	0.914									
– in gas production	1.846									
Industrial heating plants	3.215									
Petroleum refineries	77.005									
NGL-plant	2.118									
Coke plant										
Gas works										
Total transformation sector	220.607								0.837	0.024
<i>Energy sector own use</i>										
Oil and gas extraction	2.107									
Coal production										
Electric energy supply industry										
hydro power plants										
thermal power plants										
public cogeneration plants										
industrial cogeneration plants										
Industrial heating plants										
Petroleum refineries	0.907									
NGL-plant	1.511									
Gas works										
Total energy sector own use	4.525									
Losses	1.596									
Final energy demand	90.930	0.958	4.872	21.189	0.018	0.044	8.128	81.465	5.129	0.241
<i>Non energy use</i>	2.171									
Energy sector										
Petrochemical industry	2.171									
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	88.759	0.958	4.872	21.189	0.018	0.044	8.128	81.465	5.129	0.241
Industry	14.416	0.958	0.291	0.009		0.044		0.423	0.952	0.241
Iron and steel	0.829	0.006	0.108					0.013	0.043	
Non-ferrous metals	0.480		0.038					0.009	0.017	
Non-metallic minerals	1.822		0.014					0.004		
Chemical	0.317					0.044			0.038	
Construction materials	6.499	0.885	0.028	0.004				0.320	0.214	0.084
Pulp and paper	0.461		0.005						0.004	
Food production	1.978	0.067	0.061					0.009	0.440	0.157
Not elsewhere specified	2.031		0.038	0.004				0.068	0.196	
Transport	1.031		2.176	20.694	0.018		8.128	68.259		
Rail								0.628		
Road	0.879		2.176	20.694				64.693		
Air					0.018		8.128			
– international							7.785			
– domestic					0.018		0.343			
Sea and River								2.063		
Public transport	0.152							0.876		
Not elsewhere specified										
Other sectors	73.312		2.405	0.486				12.783	4.177	
Households	63.079		1.758						2.396	
Services	9.073		0.403						1.055	
Agriculture	1.160		0.108	0.334				7.961	0.491	
Construction			0.136	0.152				4.822	0.235	

Table A4-2: National Energy balance for 2022, energy units, cont.

<i>PI</i>	Naphta	White spirit	Bitumen	Lubricants	Paraffin and wax	Petroleum coke	Etan	Other derivatives
Production								
Import			0.134	4.392	1.461	0.241	4.321	
Export	3.251	0.812	0.057	0.121	0.469	0.010	0.310	
Import-processing								
Export-processing								
Stock change	0.125	-0.116			-0.017		-0.617	
Bunkers								
Energy supplied	-3.127	-0.927	0.077	4.271	0.975	0.231	3.395	
<i>Production</i>								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in refineries								
– in gas production								
Industrial heating plants								
Petroleum refineries	5.836	0.624			0.302		0.623	
NGL-plant		0.696						
Coke plant								
Gas works								
Total production	5.836	1.320			0.302		0.623	
Gross production	2.709	0.392	0.077	4.271	1.276	0.231	4.018	
<i>Transformation sector</i>								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants	2.154							
– in refineries	2.154							
– in gas production								
Industrial heating plants	0.281							
Petroleum refineries		0.392						
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	2.436	0.392						
<i>Energy sector own use</i>								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Industrial heating plants								
Petroleum refineries	0.221						0.611	
NGL-plant								
Gas works								
Total energy sector own use	0.221						0.611	
Losses								
Final energy demand	0.052	0.000	0.077	4.271	1.276	0.231	3.407	
Non energy use			0.077	4.271	1.266	0.231		
Energy sector					0.060			
Petrochemical industry						0.007		
Other industry			0.077	0.486	0.328	0.224		
Construction				3.786	0.044			
Transport					0.797			
Agriculture					0.037			
Energy consumption	0.052	0.000			0.010		3.407	
Industry	0.052						3.407	
Iron and steel								
Non-ferrous metals							0.003	
Non-metallic minerals								
Chemical								
Construction materials	0.016						3.404	
Pulp and paper								
Food production	0.036							
Not elsewhere specified								
Transport					0.010			
Rail								
Road					0.007			
Air								
– international								
– domestic						0.003		
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors								
Households								
Services								
Agriculture								
Construction								

Table A4-2: National Energy balance for 2022, energy units, cont.

PI	Refinery gas	Refinery semiproducts	Additives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production							0.591
Import			19.424	1.853		19.210	
Export	3.850					2.309	
Import-processing							
Export-processing							
Stock change	-0.888		-0.120				
Bunkers							
Energy supplied	-4.738		19.305	1.853		16.901	0.591
Production							
hydro power plants						20.065	
– small HPP						0.445	
Wind power plants						7.696	
Solar power plants						0.547	
Geothermal power plants						0.262	
thermal power plants						5.970	
public cogeneration plants						15.642	12.858
public heating plants							1.556
industrial cogeneration plants						1.012	5.027
– in refineries						0.226	2.730
– in gas production						0.480	0.520
Industrial heating plants							2.939
Petroleum refineries	4.738	3.732					
NGL-plant							
Coke plant							
Gas works							
Total production	4.738	3.732				51.194	22.381
Gross production		3.732	19.305	1.853		68.095	22.972
Transformation sector							
hydro power plants							
– small HPP							
Wind power plants							
Solar power plants							
Geothermal power plants							
thermal power plants							
public cogeneration plants							
public heating plants							
industrial cogeneration plants		0.460					
– in refineries		0.460					
– in gas production							
Industrial heating plants							
Petroleum refineries			19.305	1.853			
NGL-plant							
Coke plant							
Gas works							
Total transformation sector		0.460	19.305	1.853			
Energy sector own use							
Oil and gas extraction						0.410	0.427
Coal production							0.343
Electric energy supply industry						0.055	
hydro power plants						0.757	
thermal power plants						0.531	
public cogeneration plants						1.054	1.612
industrial cogeneration plants							
Industrial heating plants						0.080	
Petroleum refineries		3.272				0.588	3.156
NGL-plant						0.204	0.093
Gas works							
Total energy sector own use		3.272				3.681	5.631
Losses						5.973	1.684
Final energy demand			0.000			58.441	15.658
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption			0.000			58.441	15.658
Industry						11.990	8.104
Iron and steel						1.591	0.031
Non-ferrous metals						0.389	
Non-metallic minerals						0.546	0.009
Chemical						0.673	1.238
Construction materials						2.093	0.001
Pulp and paper						0.414	1.253
Food production						2.368	2.478
Not elsewhere specified						3.915	3.094
Transport						1.236	
Rail						0.662	
Road						0.044	
Air						0.127	
– international							
– domestic						0.127	
Sea and River						0.071	
Public transport						0.210	
Not elsewhere specified						0.124	
Other sectors						45.215	7.553
Households						23.271	5.212
Services						21.064	2.023
Agriculture						0.535	0.318
Construction						0.345	

Table A4-3 Industry analysis balance for 2022, energy units, cont.

ENERGY CONSUMPTION		Industrial cogenerations				Industrial heating plants	Own use (production of oil and gas)	Own use (refineries)	Own use (biogas production)	Industry								Commercial sector	
		Rafineries	Production of oil and gas	Other sectors	Total					Total	Iron and Steel	Non-Ferrous metals	Non-Metallic Minerals	Chemicals	Construction	Paper	Food		Other
Anthracite					0.0					4.4	4.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Coking coal (kameni ugljen)	10 ³ t				0.0					81.2	0.0	0.0	0.0	0.0	81.2	0.0	0.0	0.0	0.0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t				0.0					3.1	0.0	0.0	0.0	0.5	2.6	0.0	0.0	0.0	0.0
Lignite	10 ³ t				0.0					0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Natural gas	10 ⁶ m ³				0.0		154.8	51.6		411.4	20.2	13.6	51.9	33.1	62.5	58.1	122.0	50.0	232.0
Wood	10 ³ m ³				0.0					33.8	0.1	0.0	0.0	0.0	5.7	4.3	1.9	21.8	12.2
Biogas	TJ				0.0				44.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	113.8
Wood waste	TJ				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	201.7
Briketi ugljena	TJ				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108.3
Coke oven coke	TJ				0.0					876.8	3.9	0.0	0.5	0.3	89.5	73.2	313.5	395.9	463.9
Liquified petroleum gas	TJ				0.0					1935.0	6.0	0.0	0.0	0.0	1929.0	0.0	0.0	0.0	0.0
Motor Gasoline	10 ³ t				0.0					32.7	0.2	0.0	0.0	0.0	30.2	0.0	2.3	0.0	0.0
Petroleum	10 ³ t				0.0			0.0		6.2	2.3	0.8	0.3	0.0	0.6	0.1	1.3	0.8	8.6
Diesel	10 ³ t				0.0					0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Gas/Diesel oil	10 ³ t				0.0					1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Residual fuel oil	10 ³ t				0.0					9.9	0.3	0.2	0.1	0.0	7.5	0.0	0.2	1.6	0.0
Petroleum coke	10 ³ t				0.0			0.0		22.3	1.0	0.4	0.0	0.9	5.0	0.1	10.3	4.6	24.7
Refinery gas	10 ³ t				0.0			59.1		14.3	0.0	0.0	0.0	0.0	2.5	0.8	9.1	1.9	0.0
Other oil derivatives	10 ³ t				0.0			19.7		109.9	0.0	0.1	0.0	0.0	109.8	0.0	0.0	0.0	0.0
Visokopećni plin	10 ³ t				0.0			87.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Koksní plin	10 ³ t				0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas works gas	10 ³ m ³				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	GWh				0.0		37.5	100.7	0.0	3262.3	442.0	108.0	151.7	186.9	581.5	66.9	637.7	1087.6	5834.3
Steam and hot water	TJ				0.0			425.5	300.9	3453.0	13.9	0.0	0.0	497.1	0.0	0.0	195.2	2746.8	1999.7

Annex 5: Any additional information

Annex 5-1: Archiving, inventory data record sheet

5.1.1. Inventory data record sheet

Year: 2022

MODULE: ENERGY	
SUBMODULE: CO ₂ from Fuel Combustion by Source Categories	
WORKSHEET: 1_1A1A_PUBLIC_ELE_HEAT_199 0-2022	SHEET: 1A1ai, 1A1aii, 1A1aiii
STEP: 1, 2, 3, 4, 5, 6	PAGE: 1 of 1
DIRECT DATA SOURCE: A. ACTIVITY DATA: Institution/organization: Energy Institute "Hrvoje Požar" Publications: National Energy Balance for 2022; Annual Energy Report: "Energy in Croatia 2022" Contact person: dr.sc. Branko Vuk (phone: +385 1 6326 149, +385 1 6326 206) Data: Fuel consumption data and net calorific values B. METHODOLOGY/EMISSION FACTOR: Publications: IPCC (2006): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Energy Default values for carbon emission factors and fractions of carbon stored were used	
ORIGINAL DATA SOURCE: A. ACTIVITY DATA: Fuel consumption data and net calorific values for 1A1 sector were provided by National energy balance	
METHOD: Tier 1 method based on fuel consumption data and net calorific values Tier 2 method for 1A1ai (natural gas and hard coal) for CO ₂ emission calculation – country specific EF from verified reports are used Tier 2 method for 1A1aii (natural gas) for CO ₂ emission calculation – country specific EF from verified reports are used	
ADDITIONAL INTERCALCULATION: Not necessary	
DATA ARCHIVATION: Hard copy and electronic copy	
DATA GAPS:	
SUGGESTION FOR THE FUTURE:	
NOTES: Default value for carbon emission factor, fraction of carbon stored and fraction of carbon oxidized were used.	
RESPONSIBILITY: Iva Švedek EKONERG Ltd. address: Koranska 5, 10000 Zagreb tel.: +385 1 6000 111/214 fax.: +385 1 6171 560 e-mail: iva.svedek@ekonerg.hr	

Annex 5-2: GHG emission trend

Table A5.2-1: GHG emission in Croatia, Base year, for first commitment period

Croatia	CO ₂	CH ₄		N ₂ O		HFC,PFC,SF ₆	Total	Share
Base year	Gg	Gg	Gg CO ₂ eq	Gg	Gg CO ₂ eq	Gg CO ₂ eq	Gg CO ₂ eq	%
1. Energy	20582.79	69.13	1451.68	0.37	114.52	NO	22148.99	70.71
A. Fuel Comb (Sectoral Appr.)	20166.84	9.61	201.74	0.55	114.52	NO	20483.11	65.40
1. Energy Industries	7126.54	0.17	3.61	0.07	13.80	NO	7143.95	22.81
2. Man. Ind. and Constr.	5447.30	0.48	10.08	0.09	17.96	NO	5475.33	17.48
3. Transport	3987.25	1.55	32.56	0.24	50.17	NO	4069.97	12.99
4. Comm./Inst, Resid., Agric.	3605.76	7.40	155.50	0.16	32.59	NO	3793.85	12.11
5. Other	NO	NO	NO	NO	NO	NO	NO	NO
B. Fugitive Emissions from Fuels	415.95	59.52	1249.94	NO	NO	NO	1665.89	5.32
1. Solid Fuels	NO	NO	48.76	NO	NO	NO	48.76	NO
2. Oil and Natural Gas	415.95	57.20	1201.18	NO	NO	NO	1617.13	5.16
2. Industrial Processes	2417.36	0.78	16.45	2.59	804.08	947.58	4185.46	13.36
A. Mineral Products	1315.38	NE,NO	NE,NO	NE,NO	NE,NO	NO	1315.38	4.20
B. Chemical Industry	870.99	16.45	16.45	2.59	804.08	NO	1691.52	5.40
C. Metal Production	230.99	NE,NO	NE,NO	NO	NO	936.56	1167.56	3.73
D. Other Production	NE	NO	NO	NO	NO	NO	NE	NE
E. Prod. of Halocarbons & SF ₆	NO	NO	NO	NO	NO	NO	NO	NO
F. Cons. of Halocarbons & SF ₆	NO	NO	NO	NO	NO	11.01	11.01	0.04
G. Other	NO	NO	NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	80.21	NO	NO	NE	NE	NO	80.21	0.26
4. Agriculture	NO	69.42	1457.81	9.26	2870.60	NO	4328.40	13.82
A. Enteric Fermentation	NO	58.54	1229.36	0.00	0.00	NO	1229.36	3.92
B. Manure Management	NO	10.88	228.44	1.22	378.74	NO	607.18	1.94
C. Rice Cultivation	NO	NO	NO	0.00	0.00	NO	NO	NO
D. Agricultural Soils	NO	NO	NO	8.04	2491.86	NO	2491.86	7.96
E. Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agr. Residues	NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NE,NO
G. Other	NO	NO	NO	NO	NO	NO	NO	NO
5. Land-Use Change and Forestry	-4184.93	0.00	0.01	0.00	0.00	NO	-4184.92	-13.36
A. Forest Land	-4184.93	0.00	0.01	0.00	0.00	NO	-4184.92	-13.36
B. Cropland	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NO
C. Grassland	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NO
D. Wetlands	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NO
E. Settlements	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NO
F. Other Land	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NO
G. Other	NE	NE	NE	NE	NE	NO	NE	NE
6. Waste	0.09	23.81	499.94	0.25	78.69	NO	578.72	1.85
A. Solid Waste Disp. on Land	NE,NO	10.53	221.21	0.00	0.00	NO	221.21	0.71
B. Waste-water Handling	0.00	13.27	278.73	0.25	78.69	NO	357.42	1.14
C. Waste Incineration	0.09	NE,NO	NE,NO	NE,NO	NE,NO	NO	0.09	0.00
D. Other	NO	NO	NO	NO	NO	NO	NO	NO
Total Em./Rem. with LUCF	18895.52	163.14	3425.89	12.48	3867.89	947.58	27136.87	86.64
Total Emissions without LUCF	23080.45	163.14	3425.89	12.48	3867.89	947.58	31321.79	100.0
Share of Gases in Total Em./Rem.	69.63		12.62		14.25		100.00	
Share of Gases in Total Emissions	73.69		10.94		12.35		100.00	
Memo Items:								
International Bunkers	451.83	0.01	0.20	0.01	3.28	NO	455.31	
Aviation	343.29	0.00	0.05	0.01	3.01	NO	346.35	
Marine	108.54	0.01	0.15	0.00	0.27	NO	108.96	
Multilateral Operations	C	C	C	C	C	NO	C	
CO₂ Emissions from Biomass	2,436.76	NO	NO	NO	NO	NO	2436.76	

Table A5.2-2: GHG emission in Croatia, 1990

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1990
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	16480.42	5009.96	2579.57	NO	1117.28	11.06	NO	NO	25198.28
1. Energy	20257.36	932.88	221.46						21411.71
A. Fuel combustion (sectoral approach)	19674.84	463.48	220.85						20359.17
1. Energy industries	7065.79	6.08	15.48						7087.34
2. Manufacturing industries and construction	5103.04	10.23	14.67						5127.95
3. Transport	3787.06	46.58	65.00						3898.63
4. Other sectors	3718.95	400.59	125.70						4245.24
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	582.52	469.41	0.62						1052.54
1. Solid fuels	NO	66.80	NO,NA						66.80
2. Oil and natural gas	582.52	402.61	0.62						985.74
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2566.58	10.47	703.39	NO	1117.28	11.06	NO	NO	4408.77
A. Mineral industry	1297.56								1297.56
B. Chemical industry	751.10	6.10	670.74	NO	NO	NO	NO	NO	1427.94
C. Metal industry	336.40	4.37	NO	NO	1117.28	NO	NO	NO	1458.05
D. Non-energy products from fuels and solvent use	181.52	NA	NA						181.52
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.06	NO	NO	43.70
H. Other	NA	NA	NA						NA
3. Agriculture	50.02	2827.94	1546.38						4424.34
A. Enteric fermentation		2336.03							2336.03
B. Manure management		491.91	284.43						776.33
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1261.96						1261.96
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.02								50.02
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6394.08	1.38	44.66						-6348.04
A. Forest land	-6495.92	1.26	1.14						-6493.52
B. Cropland	114.91	NO	3.52						118.42
C. Grassland	-7.88	0.12	1.52						-6.24
D. Wetlands	77.23	NO	9.88						87.11
E. Settlements	235.44	NO	28.61						264.05
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-317.85								-317.85
H. Other	NO	NO	NO						NO
5. Waste	0.54	1237.29	63.68						1301.50
A. Solid waste disposal	NA,NO	558.58							558.58
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	19.20	4.20						23.94
D. Waste water treatment and discharge		659.52	59.48						718.99
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	643.85	0.48	4.71						649.03
Aviation	496.62	0.10	3.68						500.39
Navigation	147.23	0.38	1.03						148.64
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5237.84								5237.84
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3512.67								3512.67
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31546.32
Total CO₂ equivalent emissions with land use, land-use change and forestry									25198.28
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

Table A5.2-3: GHG emission in Croatia, 1991

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1991
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	9416.05	4855.29	2444.94	NO	766.41	10.93	NO	NO	17493.62
I. Energy	15021.34	877.79	190.33						16089.46
A. Fuel combustion (sectoral approach)	14444.43	495.49	189.88						15129.80
1. Energy industries	4742.10	4.45	10.66						4757.22
2. Manufacturing industries and construction	3773.02	7.71	10.86						3791.59
3. Transport	2866.99	35.16	52.27						2954.42
4. Other sectors	3062.32	448.16	116.09						3626.57
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	576.92	382.30	0.45						959.66
1. Solid fuels	NO	59.53	NO,NA						59.53
2. Oil and natural gas	576.92	322.77	0.45						900.13
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1919.86	9.79	622.03	NO	766.41	10.93	NO	NO	3329.03
A. Mineral industry	860.77								860.77
B. Chemical industry	665.95	5.62	589.39	NO	NO	NO	NO	NO	1260.95
C. Metal industry	270.10	4.18	NO	NO	766.41	NO	NO	NO	1040.68
D. Non-energy products from fuels and solvent use	123.05	NA	NA						123.05
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use			32.65	NO	NO	10.93	NO	NO	43.58
H. Other	NA	NA	NA						NA
3. Agriculture	50.95	2708.70	1526.91						4286.56
A. Enteric fermentation		2207.56							2207.56
B. Manure management		501.14	273.86						775.00
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1253.04						1253.04
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.95								50.95
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7576.63	3.56	45.43						-7527.63
A. Forest land	-8165.39	3.37	2.25						-8159.78
B. Cropland	127.70	NO	3.87						131.58
C. Grassland	3.98	0.20	2.15						6.32
D. Wetlands	67.51	NO	9.45						76.96
E. Settlements	213.33	NO	27.72						241.05
F. Other land	NO	NO	NO						NO
G. Harvested wood products	176.24								176.24
H. Other	NO	NO	NO						NO
5. Waste	0.54	1255.44	60.23						1316.21
A. Solid waste disposal	NA,NO	582.67							582.67
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	18.14	3.97						22.64
D. Waste water treatment and discharge		654.63	56.26						710.89
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	94.29	0.02	0.70						95.01
Aviation	94.29	0.02	0.70						95.01
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6091.91								6091.91
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3696.93								3696.93
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									25021.26
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									17493.62
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-4: GHG emission in Croatia, 1992

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1992
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8677.41	4354.68	2463.33	NO	NO	11.02	NO	NO	15506.44
1. Energy	14350.80	917.30	171.47						15439.57
A. Fuel combustion (sectoral approach)	13763.01	422.32	171.07						14356.40
1. Energy industries	5342.75	5.05	13.58						5361.38
2. Manufacturing industries and construction	3083.15	6.09	8.53						3097.77
3. Transport	2776.79	31.12	45.70						2853.60
4. Other sectors	2560.33	380.07	103.26						3043.65
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	587.79	494.97	0.41						1083.17
1. Solid fuels	NO	46.25	NO,NA						46.25
2. Oil and natural gas	587.79	448.72	0.41						1036.91
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1958.12	8.48	802.06	NO	NO	11.02	NO	NO	2779.68
A. Mineral industry	930.52								930.52
B. Chemical industry	832.68	5.74	769.41	NO	NO	NO	NO	NO	1607.83
C. Metal industry	121.11	2.74	NO	NO	NO	NO	NO	NO	123.85
D. Non-energy products from fuels and solvent use	73.82	NA	NA						73.82
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.02	NO	NO	43.67
H. Other	NA	NA	NA						NA
3. Agriculture	65.51	2143.60	1377.63						3586.74
A. Enteric fermentation		1742.71							1742.71
B. Manure management		400.88	214.32						615.21
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1163.31						1163.31
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	65.51								65.51
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7697.56	16.97	52.52						-7628.06
A. Forest land	-8351.03	15.28	8.48						-8327.27
B. Cropland	129.64	NO	4.23						133.87
C. Grassland	-0.24	1.69	3.97						5.42
D. Wetlands	64.47	NO	9.02						73.49
E. Settlements	206.78	NO	26.83						233.61
F. Other land	NO	NO	NO						NO
G. Harvested wood products	252.83								252.83
H. Other	NO	NO	NO						NO
5. Waste	0.54	1268.34	59.64						1328.51
A. Solid waste disposal	NA,NO	603.48							603.48
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	13.91	3.05						17.49
D. Waste water treatment and discharge		650.95	56.60						707.54
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	72.29	0.01	0.54						72.84
Aviation	72.29	0.01	0.54						72.84
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5308.28								5308.28
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3869.94								3869.94
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									23134.51
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									15506.44
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-4: GHG emission in Croatia, 1993

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1993
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8910.29	4285.28	2120.33	NO	NO	11.14	NO	NO	15327.04
1. Energy	15116.98	804.40	179.87						16101.25
A. Fuel combustion (sectoral approach)	14330.72	441.10	179.46						14951.27
1. Energy industries	5940.22	5.48	15.25						5960.95
2. Manufacturing industries and construction	2916.99	5.75	8.03						2930.77
3. Transport	2925.16	30.91	49.06						3005.14
4. Other sectors	2548.34	398.96	107.12						3054.42
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	786.27	363.30	0.41						1149.97
1. Solid fuels	NO	44.27	NO,NA						44.27
2. Oil and natural gas	786.27	319.03	0.41						1105.71
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1638.12	7.00	612.64	NO	NO	11.14	NO	NO	2268.89
A. Mineral industry	794.62								794.62
B. Chemical industry	715.96	5.77	579.99	NO	NO	NO	NO	NO	1301.72
C. Metal industry	57.46	1.23	NO	NO	NO	NO	NO	NO	58.69
D. Non-energy products from fuels and solvent use	70.06	NA	NA						70.06
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.14	NO	NO	43.79
H. Other	NA	NA	NA						NA
3. Agriculture	52.14	2156.92	1204.62						3413.68
A. Enteric fermentation		1733.21							1733.21
B. Manure management		423.71	212.46						636.17
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	992.16						992.16
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	52.14								52.14
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7897.48	38.52	63.50						-7795.47
A. Forest land	-8353.82	36.75	19.74						-8297.33
B. Cropland	131.57	NO	4.59						136.16
C. Grassland	-3.30	1.77	4.65						3.12
D. Wetlands	61.43	NO	8.58						70.01
E. Settlements	200.23	NO	25.94						226.17
F. Other land	NO	NO	NO						NO
G. Harvested wood products	66.40								66.40
H. Other	NO	NO	NO						NO
5. Waste	0.54	1278.45	59.71						1338.69
A. Solid waste disposal	NA,NO	616.76							616.76
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	13.37	2.93						16.83
D. Waste water treatment and discharge		648.32	56.79						705.11
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	182.30	0.04	1.35						183.69
Aviation	182.30	0.04	1.35						183.69
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5583.98								5583.98
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4059.84								4059.84
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									23122.50
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									15327.04
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-6: GHG emission in Croatia, 1994

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1994
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	7926.05	4058.78	2146.77	NO	NO	11.96	NO	NO	14143.56
I. Energy	14179.84	732.52	174.38						15086.74
A. Fuel combustion (sectoral approach)	13474.77	403.71	174.01						14052.49
1. Energy industries	4658.42	3.69	10.74						4672.85
2. Manufacturing industries and construction	3077.43	5.33	7.53						3090.28
3. Transport	3102.93	33.82	50.34						3187.09
4. Other sectors	2635.99	360.89	105.40						3102.27
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	705.07	328.81	0.37						1034.25
1. Solid fuels	NO	39.69	NO,NA						39.69
2. Oil and natural gas	705.07	289.12	0.37						994.56
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1823.58	7.31	660.70	NO	NO	11.96	NO	NO	2503.54
A. Mineral industry	953.71								953.71
B. Chemical industry	715.58	5.48	628.05	NO	NO	NO	NO	NO	1349.12
C. Metal industry	81.17	1.83	NO	NO	NO	NO	NO	NO	83.00
D. Non-energy products from fuels and solvent use	73.11	NA	NA						73.11
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.96	NO	NO	44.60
H. Other	NA	NA	NA						NA
3. Agriculture	47.57	2005.42	1200.16						3253.16
A. Enteric fermentation		1576.63							1576.63
B. Manure management		428.79	204.08						632.87
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	996.08						996.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	47.57								47.57
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8125.48	12.89	49.40						-8063.19
A. Forest land	-8457.29	11.96	6.77						-8438.56
B. Cropland	133.50	NO	4.94						138.45
C. Grassland	-7.89	0.92	4.49						-2.48
D. Wetlands	58.39	NO	8.15						66.54
E. Settlements	193.31	NO	25.05						218.36
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-45.49								-45.49
H. Other	NO	NO	NO						NO
5. Waste	0.54	1300.65	62.13						1363.31
A. Solid waste disposal	NA,NO	636.87							636.87
B. Biological treatment of solid waste		0.61	0.35						0.96
C. Incineration and open burning of waste	0.54	12.56	2.75						15.85
D. Waste water treatment and discharge		650.60	59.03						709.63
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	403.81	0.41	2.93						407.15
Aviation	264.02	0.05	1.96						266.03
Navigation	139.78	0.36	0.97						141.11
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	4999.29								4999.29
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4266.42								4266.42
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									22206.75
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									14143.56
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-7: GHG emission in Croatia, 1995

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1995
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8205.16	4011.43	2073.60	21.43	NO	12.45	NO	NO	14324.07
I. Energy	15115.44	750.44	165.98						16031.87
A. Fuel combustion (sectoral approach)	14279.66	425.87	165.62						14871.16
1. Energy industries	5261.60	4.54	11.00						5277.14
2. Manufacturing industries and construction	2868.29	5.24	7.42						2880.96
3. Transport	3292.91	35.27	45.83						3374.01
4. Other sectors	2856.86	380.82	101.37						3339.05
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	835.78	324.57	0.36						1160.71
1. Solid fuels	NO	31.61	NO,NA						31.61
2. Oil and natural gas	835.78	292.96	0.36						1129.09
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1649.08	6.55	635.45	21.43	NO	12.45	NO	NO	2324.96
A. Mineral industry	739.76								739.76
B. Chemical industry	756.00	5.67	602.81	NO	NO	NO	NO	NO	1364.48
C. Metal industry	40.32	0.88	NO	NO	NO	NO	NO	NO	41.19
D. Non-energy products from fuels and solvent use	113.00	NA	NA						113.00
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				21.43	NO	NO	NO	NO	21.43
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.45	NO	NO	45.09
H. Other	NA	NA	NA						NA
3. Agriculture	46.29	1927.22	1158.53						3132.04
A. Enteric fermentation		1516.84							1516.84
B. Manure management		410.38	190.45						600.83
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	968.07						968.07
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	46.29								46.29
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8606.19	8.45	46.58						-8551.16
A. Forest land	-8917.06	7.87	4.64						-8904.56
B. Cropland	135.43	NO	5.30						140.74
C. Grassland	-11.98	0.58	4.76						-6.64
D. Wetlands	55.34	NO	7.72						63.06
E. Settlements	187.18	NO	24.16						211.33
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-55.09								-55.09
H. Other	NO	NO	NO						NO
5. Waste	0.54	1318.76	67.06						1386.36
A. Solid waste disposal	NA,NO	662.56							662.56
B. Biological treatment of solid waste		0.65	0.37						1.01
C. Incineration and open burning of waste	0.54	11.99	2.62						15.15
D. Waste water treatment and discharge		643.57	64.07						707.64
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	348.25	0.31	2.54						351.10
Aviation	245.16	0.05	1.82						247.03
Navigation	103.08	0.27	0.72						104.07
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5288.54								5288.54
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4482.76								4482.76
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									22875.23
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									14324.07
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-8: GHG emission in Croatia, 1996

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1996
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	9070.54	3984.54	2079.02	24.32	NO	12.90	NO	NO	15171.31
I. Energy	15630.57	786.58	210.77						16627.92
A. Fuel combustion (sectoral approach)	14820.27	474.03	210.42						15504.72
1. Energy industries	5085.53	4.56	11.51						5101.60
2. Manufacturing industries and construction	2857.50	5.14	7.26						2869.90
3. Transport	3620.22	38.22	70.92						3729.36
4. Other sectors	3257.02	426.10	120.74						3803.86
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	810.30	312.55	0.35						1123.20
1. Solid fuels	NO	25.50	NO,NA						25.50
2. Oil and natural gas	810.30	287.05	0.35						1097.70
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1652.37	5.80	594.42	24.32	NO	12.90	NO	NO	2289.80
A. Mineral industry	826.77								826.77
B. Chemical industry	701.63	5.44	561.78	NO	NO	NO	NO	NO	1268.84
C. Metal industry	19.17	0.35	NO	NO	NO	NO	NO	NO	19.53
D. Non-energy products from fuels and solvent use	104.80	NA	NA						104.80
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				24.32	NO	NO	NO	NO	24.32
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.90	NO	NO	45.54
H. Other	NA	NA	NA						NA
3. Agriculture	52.44	1838.98	1157.86						3049.29
A. Enteric fermentation		1428.37							1428.37
B. Manure management		410.61	180.35						590.96
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	977.51						977.51
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	52.44								52.44
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8265.37	18.52	51.83						-8195.03
A. Forest land	-8607.75	16.96	9.41						-8581.38
B. Cropland	137.37	NO	5.66						143.03
C. Grassland	-15.71	1.55	6.21						-7.95
D. Wetlands	52.30	NO	7.29						59.59
E. Settlements	180.69	NO	23.27						203.95
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-12.27								-12.27
H. Other	NO	NO	NO						NO
5. Waste	0.54	1334.67	64.13						1399.34
A. Solid waste disposal	NA,NO	689.95							689.95
B. Biological treatment of solid waste		0.68	0.39						1.07
C. Incineration and open burning of waste	0.54	11.92	2.61						15.06
D. Waste water treatment and discharge		632.12	61.14						693.25
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	339.28	0.34	2.46						342.09
Aviation	223.16	0.04	1.65						224.86
Navigation	116.12	0.30	0.81						117.23
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5877.64								5877.64
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4706.83								4706.83
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									23366.34
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									15171.31
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-9: GHG emission in Croatia, 1997

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1997
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	10911.74	3958.49	2253.82	28.30	NO	12.52	NO	NO	17164.87
1. Energy	16682.92	749.73	210.59						17643.23
A. Fuel combustion (sectoral approach)	15920.57	443.70	210.23						16574.51
1. Energy industries	5557.16	5.00	13.43						5575.58
2. Manufacturing industries and construction	3088.88	5.83	8.17						3102.89
3. Transport	3966.11	40.41	83.17						4089.68
4. Other sectors	3308.41	392.47	105.47						3806.35
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.35	306.03	0.35						1068.73
1. Solid fuels	NO	18.65	NO,NA						18.65
2. Oil and natural gas	762.35	287.37	0.35						1050.07
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1813.71	6.17	624.06	28.30	NO	12.52	NO	NO	2484.76
A. Mineral industry	948.72								948.72
B. Chemical industry	743.07	5.34	591.42	NO	NO	NO	NO	NO	1339.83
C. Metal industry	40.82	0.83	NO	NO	NO	NO	NO	NO	41.65
D. Non-energy products from fuels and solvent use	81.09	NA	NA						81.09
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				28.30	NO	NO	NO	NO	28.30
G. Other product manufacture and use			32.65	NO	NO	12.52	NO	NO	45.17
H. Other	NA	NA	NA						NA
3. Agriculture	68.39	1817.88	1302.59						3188.85
A. Enteric fermentation		1402.54							1402.54
B. Manure management		415.34	176.66						592.00
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1125.92						1125.92
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	68.39								68.39
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7655.10	19.74	52.03						-7583.33
A. Forest land	-8115.92	18.23	10.07						-8087.62
B. Cropland	139.30	NO	6.01						145.31
C. Grassland	-20.57	1.51	6.71						-12.34
D. Wetlands	49.26	NO	6.86						56.11
E. Settlements	172.86	NO	22.37						195.24
F. Other land	NO	NO	NO						NO
G. Harvested wood products	119.97								119.97
H. Other	NO	NO	NO						NO
5. Waste	1.82	1364.97	64.56						1431.36
A. Solid waste disposal	NA,NO	717.95							717.95
B. Biological treatment of solid waste		0.72	0.41						1.12
C. Incineration and open burning of waste	1.82	11.47	2.53						15.82
D. Waste water treatment and discharge		634.84	61.62						696.46
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	310.14	0.24	2.26						312.64
Aviation	235.74	0.05	1.75						237.53
Navigation	74.41	0.19	0.52						75.12
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5526.07								5526.07
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4930.49								4930.49
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									24748.20
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									17164.87
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-10: GHG emission in Croatia, 1998

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1998
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11527.91	3961.38	1958.28	33.88	NO	13.40	NO	NO	17494.86
I. Energy	17274.13	736.27	195.55						18205.95
A. Fuel combustion (sectoral approach)	16596.67	447.82	195.23						17239.72
1. Energy industries	6238.88	5.83	14.98						6259.68
2. Manufacturing industries and construction	3091.23	5.63	7.99						3104.85
3. Transport	4098.78	41.34	61.01						4201.13
4. Other sectors	3167.79	395.02	111.25						3674.06
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	677.45	288.45	0.33						966.23
1. Solid fuels	NO	19.54	NO,NA						19.54
2. Oil and natural gas	677.45	268.91	0.33						946.69
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1716.65	5.48	477.89	33.88	NO	13.40	NO	NO	2247.29
A. Mineral industry	1014.42								1014.42
B. Chemical industry	592.72	5.05	445.24	NO	NO	NO	NO	NO	1043.01
C. Metal industry	29.65	0.42	NO	NO	NO	NO	NO	NO	30.08
D. Non-energy products from fuels and solvent use	79.85	NA	NA						79.85
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				33.88	NO	NO	NO	NO	33.88
G. Other product manufacture and use			32.65	NO	NO	13.40	NO	NO	46.05
H. Other	NA	NA	NA						NA
3. Agriculture	44.25	1787.45	1152.71						2984.41
A. Enteric fermentation		1368.17							1368.17
B. Manure management		419.28	170.83						590.11
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	981.88						981.88
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	44.25								44.25
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7510.81	50.53	69.24						-7391.04
A. Forest land	-7845.30	44.61	23.89						-7776.81
B. Cropland	141.23	NO	6.37						147.60
C. Grassland	-24.06	5.92	11.08						-7.06
D. Wetlands	46.21	NO	6.42						52.64
E. Settlements	167.43	NO	21.47						188.90
F. Other land	NO	NO	NO						NO
G. Harvested wood products	3.68								3.68
H. Other	NO	NO	NO						NO
5. Waste	3.70	1381.66	62.88						1448.24
A. Solid waste disposal	NA,NO	745.62							745.62
B. Biological treatment of solid waste		0.75	0.43						1.18
C. Incineration and open burning of waste	3.70	11.34	2.53						17.57
D. Waste water treatment and discharge		623.95	59.92						683.87
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	336.44	0.26	2.46						339.16
Aviation	254.59	0.05	1.89						256.53
Navigation	81.85	0.21	0.57						82.63
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5535.75								5535.75
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	5178.86								5178.86
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
	Total CO₂ equivalent emissions without land use, land-use change and forestry								24885.90
	Total CO₂ equivalent emissions with land use, land-use change and forestry								17494.86
	Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry								NA
	Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry								NA

Table A5.2-11: GHG emission in Croatia, 1999

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1999
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11845.12	3977.86	2141.96	40.89	NO	13.35	NO	NO	18019.17
1. Energy	17954.41	709.95	247.57						18911.94
A. Fuel combustion (sectoral approach)	17292.55	441.92	247.27						17981.74
1. Energy industries	6459.12	6.13	15.48						6480.73
2. Manufacturing industries and construction	2925.26	4.74	6.81						2936.81
3. Transport	4329.18	42.04	104.73						4475.95
4. Other sectors	3578.99	389.01	120.25						4088.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	661.86	268.03	0.30						930.19
1. Solid fuels	NO	5.88	NO,NA						5.88
2. Oil and natural gas	661.86	262.14	0.30						924.31
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2072.14	5.54	557.50	40.89	NO	13.35	NO	NO	2689.43
A. Mineral industry	1268.53								1268.53
B. Chemical industry	701.41	5.06	524.85	NO	NO	NO	NO	NO	1231.33
C. Metal industry	27.67	0.48	NO	NO	NO	NO	NO	NO	28.15
D. Non-energy products from fuels and solvent use	74.54	NA	NA						74.54
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				40.89	NO	NO	NO	NO	40.89
G. Other product manufacture and use	NO	NO	32.65	NO	NO	13.35	NO	NO	46.00
H. Other	NA	NA	NA						NA
3. Agriculture	50.49	1836.31	1225.03						3111.83
A. Enteric fermentation		1375.91							1375.91
B. Manure management		460.40	178.69						639.09
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1046.34						1046.34
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.49								50.49
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8236.31	6.62	44.55						-8185.14
A. Forest land	-8498.34	4.77	3.06						-8490.52
B. Cropland	143.17	NO	6.73						149.89
C. Grassland	-27.56	1.85	8.19						-17.52
D. Wetlands	43.17	NO	5.99						49.16
E. Settlements	161.52	NO	20.58						182.10
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-58.26								-58.26
H. Other	NO	NO	NO						NO
5. Waste	4.38	1419.44	67.31						1491.13
A. Solid waste disposal	NA,NO	778.46							778.46
B. Biological treatment of solid waste		0.79	0.45						1.23
C. Incineration and open burning of waste	4.38	10.44	2.35						17.17
D. Waste water treatment and discharge		629.75	64.51						694.26
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	311.54	0.22	2.28						314.04
Aviation	245.16	0.05	1.82						247.03
Navigation	66.37	0.17	0.47						67.01
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5328.01								5328.01
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	5426.47								5426.47
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									26204.32
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									18019.17
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-12: GHG emission in Croatia, 2000

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2000
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12705.01	4018.40	2303.14	49.40	NO	12.72	NO	NO	19088.67
1. Energy	17347.86	653.83	253.13						18254.81
A. Fuel combustion (sectoral approach)	16636.44	395.90	252.84						17285.18
1. Energy industries	5810.87	4.42	16.53						5831.82
2. Manufacturing industries and construction	3052.78	5.00	7.19						3064.96
3. Transport	4354.38	40.50	106.55						4501.44
4. Other sectors	3418.41	345.98	122.57						3886.96
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	711.42	257.92	0.29						969.63
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	711.42	257.92	0.29						969.63
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2237.39	3.81	649.74	49.40	NO	12.72	NO	NO	2953.06
A. Mineral industry	1426.45								1426.45
B. Chemical industry	704.40	3.27	617.10	NO	NO	NO	NO	NO	1324.76
C. Metal industry	29.68	0.54	NO	NO	NO	NO	NO	NO	30.22
D. Non-energy products from fuels and solvent use	76.87	NA	NA						76.87
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				49.40	NO	NO	NO	NO	49.40
G. Other product manufacture and use			32.65	NO	NO	12.72	NO	NO	45.36
H. Other	NA	NA	NA						NA
3. Agriculture	60.87	1798.12	1234.21						3093.20
A. Enteric fermentation		1349.71							1349.71
B. Manure management		448.41	169.57						617.97
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1064.64						1064.64
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	60.87								60.87
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6947.26	108.54	100.59						-6738.14
A. Forest land	-7186.07	97.56	51.65						-7036.86
B. Cropland	145.10	NO	7.09						152.18
C. Grassland	-32.63	10.98	16.62						-5.03
D. Wetlands	40.13	NO	5.56						45.69
E. Settlements	155.88	NO	19.67						175.55
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-69.66								-69.66
H. Other	NO	NO	NO						NO
5. Waste	6.15	1454.11	65.48						1525.73
A. Solid waste disposal	NA,NO	807.43							807.43
B. Biological treatment of solid waste		0.89	0.51						1.40
C. Incineration and open burning of waste	6.15	9.44	2.16						17.75
D. Waste water treatment and discharge		636.34	62.81						699.15
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	258.78	0.19	1.89						260.86
Aviation	201.16	0.04	1.49						202.69
Navigation	57.62	0.15	0.40						58.17
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	4771.83								4771.83
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	5687.40								5687.40
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									25826.81
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									19088.67
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-13: GHG emission in Croatia, 2001

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2001
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12714.22	4011.58	2226.82	60.44	NO	12.81	NO	NO	19025.88
1. Energy	18351.53	697.66	243.43						19292.63
A. Fuel combustion (sectoral approach)	17589.38	423.94	243.16						18256.48
1. Energy industries	6343.85	5.00	18.64						6367.49
2. Manufacturing industries and construction	3189.68	4.91	7.15						3201.74
3. Transport	4420.07	34.64	95.00						4549.71
4. Other sectors	3635.78	379.40	122.38						4137.55
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.15	273.72	0.27						1036.15
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	762.15	273.72	0.27						1036.15
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2325.71	3.94	549.69	60.44	NO	12.81	NO	NO	2952.59
A. Mineral industry	1644.58								1644.58
B. Chemical industry	595.81	3.92	517.91	NO	NO	NO	NO	NO	1117.64
C. Metal industry	7.15	0.02	NO	NO	NO	NO	NO	NO	7.18
D. Non-energy products from fuels and solvent use	78.18	NA	NA						78.18
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				60.44	NO	NO	NO	NO	60.44
G. Other product manufacture and use				NO	NO	12.81	NO	NO	44.58
H. Other	NA	NA	NA						NA
3. Agriculture	92.09	1828.72	1305.92						3226.74
A. Enteric fermentation		1363.14							1363.14
B. Manure management		465.58	169.36						634.94
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1136.56						1136.56
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	92.09								92.09
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8061.80	21.28	59.08						-7981.45
A. Forest land	-8209.73	17.94	9.97						-8181.82
B. Cropland	147.03	NO	7.44						154.47
C. Grassland	-26.55	3.33	11.64						-11.58
D. Wetlands	36.36	NO	5.10						41.45
E. Settlements	297.21	NO	24.93						322.15
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-306.12								-306.12
H. Other	NO	NO	NO						NO
5. Waste	6.68	1459.98	68.71						1535.38
A. Solid waste disposal	NA,NO	839.41							839.41
B. Biological treatment of solid waste		0.72	0.41						1.13
C. Incineration and open burning of waste	6.68	9.21	2.12						18.01
D. Waste water treatment and discharge		610.64	66.19						676.82
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	291.47	0.27	2.12						293.86
Aviation	201.16	0.04	1.49						202.69
Navigation	90.31	0.23	0.63						91.17
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5187.98								5187.98
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	5962.47								5962.47
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									27007.33
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									19025.88
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-14: GHG emission in Croatia, 2002

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2002
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13587.81	4001.81	2154.03	80.83	NO	13.15	NO	NO	19837.63
I. Energy	19539.19	687.03	209.26						20435.48
A. Fuel combustion (sectoral approach)	18762.83	408.03	208.99						19379.84
1. Energy industries	7225.52	5.48	22.16						7253.16
2. Manufacturing industries and construction	3084.91	4.87	7.11						3096.89
3. Transport	4729.32	33.53	64.59						4827.43
4. Other sectors	3723.08	364.14	115.14						4202.36
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	776.36	279.00	0.27						1055.63
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	776.36	279.00	0.27						1055.63
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2292.32	3.67	534.85	80.83	NO	13.15	NO	NO	2924.82
A. Mineral industry	1645.41								1645.41
B. Chemical industry	550.89	3.66	503.95	NO	NO	NO	NO	NO	1058.50
C. Metal industry	4.72	0.01	NO	NO	NO	NO	NO	NO	4.73
D. Non-energy products from fuels and solvent use	91.30	NA	NA						91.30
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				80.83	NO	NO	NO	NO	80.83
G. Other product manufacture and use	NO	NO	30.90	NO	NO	13.15	NO	NO	44.05
H. Other	NA	NA	NA						NA
3. Agriculture	80.76	1811.77	1279.90						3172.42
A. Enteric fermentation		1332.32							1332.32
B. Manure management		479.44	167.79						647.23
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1112.11						1112.11
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	80.76								80.76
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8328.23	7.16	57.70						-8263.37
A. Forest land	-8510.18	6.29	3.88						-8500.00
B. Cropland	148.96	NO	7.80						156.76
C. Grassland	-37.52	0.87	11.18						-25.46
D. Wetlands	33.09	NO	4.63						37.72
E. Settlements	339.75	NO	30.20						369.95
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-302.33								-302.33
H. Other	NO	NO	NO						NO
5. Waste	3.78	1492.19	72.32						1568.28
A. Solid waste disposal	NA,NO	874.43							874.43
B. Biological treatment of solid waste		0.96	0.55						1.51
C. Incineration and open burning of waste	3.78	9.02	2.03						14.83
D. Waste water treatment and discharge		607.77	69.74						677.51
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	262.60	0.23	1.92						264.74
Aviation	188.59	0.04	1.40						190.02
Navigation	74.01	0.19	0.52						74.72
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	4975.57								4975.57
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	6251.70								6251.70
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									28101.00
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									19837.63
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-15: GHG emission in Croatia, 2003

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2003
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15661.11	4221.03	2098.57	106.82	NO	13.50	NO	NO	22101.03
1. Energy	20829.42	743.66	221.90						21794.97
A. Fuel combustion (sectoral approach)	20100.62	463.50	221.64						20785.75
1. Energy industries	7871.16	6.53	23.03						7900.71
2. Manufacturing industries and construction	3150.05	5.55	7.97						3163.56
3. Transport	5126.76	32.50	66.37						5225.63
4. Other sectors	3952.65	418.92	124.27						4495.84
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	728.80	280.16	0.26						1009.22
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	728.80	280.16	0.26						1009.22
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2325.36	3.49	506.57	106.82	NO	13.50	NO	NO	2955.73
A. Mineral industry	1652.12								1652.12
B. Chemical industry	574.42	3.47	476.55	NO	NO	NO	NO	NO	1054.44
C. Metal industry	6.62	0.02	NO	NO	NO	NO	NO	NO	6.64
D. Non-energy products from fuels and solvent use	92.19	NA	NA						92.19
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				106.82	NO	NO	NO	NO	106.82
G. Other product manufacture and use			30.02	NO	NO	13.50	NO	NO	43.52
H. Other	NA	NA	NA						NA
3. Agriculture	71.79	1905.72	1213.41						3190.91
A. Enteric fermentation		1390.19							1390.19
B. Manure management		515.53	171.77						687.30
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1041.63						1041.63
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	71.79								71.79
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7566.26	44.30	85.10						-7436.86
A. Forest land	-7887.14	40.26	21.68						-7825.19
B. Cropland	150.90	NO	8.16						159.05
C. Grassland	-49.14	4.04	15.61						-29.50
D. Wetlands	29.82	NO	4.17						33.98
E. Settlements	380.13	NO	35.49						415.61
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-190.82								-190.82
H. Other	NO	NO	NO						NO
5. Waste	0.80	1523.87	71.60						1596.27
A. Solid waste disposal	NA,NO	912.80							912.80
B. Biological treatment of solid waste		0.69	0.39						1.08
C. Incineration and open burning of waste	0.80	8.78	1.93						11.51
D. Waste water treatment and discharge		601.60	69.28						670.88
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	251.70	0.21	1.83						253.74
Aviation	182.30	0.04	1.35						183.69
Navigation	69.39	0.18	0.48						70.05
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5755.73								5755.73
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	6559.09								6559.09
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									29537.89
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									22101.03
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-16: GHG emission in Croatia, 2004

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2004
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	
SINK CATEGORIES	CO ₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	15015.42	4283.00	2291.25	127.86	NO	13.95	NO	NO	21731.48	
I. Energy	20240.89	728.87	253.07						21222.82	
A. Fuel combustion (sectoral approach)	19462.97	450.72	252.82						20166.50	
1. Energy industries	6784.01	5.45	20.90						6810.36	
2. Manufacturing industries and construction	3551.72	6.67	9.48						3567.87	
3. Transport	5262.21	30.47	104.55						5397.23	
4. Other sectors	3865.02	408.13	117.89						4391.04	
5. Other	NO,IE	NO,IE	NO,IE						NO,IE	
B. Fugitive emissions from fuels	777.92	278.15	0.25						1056.32	
1. Solid fuels	NO	NO	NO,NA						NO,NA	
2. Oil and natural gas	777.92	278.15	0.25						1056.32	
C. CO ₂ transport and storage	NO								NO	
2. Industrial processes and product use	2537.35	4.19	608.48	127.86	NO	13.95	NO	NO	3291.83	
A. Mineral industry	1748.15								1748.15	
B. Chemical industry	665.57	4.19	579.33	NO	NO	NO	NO	NO	1249.08	
C. Metal industry	13.72	NA,NO	NO	NO	NO	NO	NO	NO	13.72	
D. Non-energy products from fuels and solvent use	109.91	NA	NA						109.91	
E. Electronic industry				NO	NO	NO	NO	NO	NO	
F. Product uses as ODS substitutes				127.86	NO	NO	NO	NO	127.86	
G. Other product manufacture and use			29.15	NO	NO	13.95	NO	NO	43.10	
H. Other	NA	NA	NA						NA	
3. Agriculture	75.94	1980.02	1288.72						3344.68	
A. Enteric fermentation		1431.35							1431.35	
B. Manure management		548.67	173.65						722.32	
C. Rice cultivation		NO							NO	
D. Agricultural soils		NE	1115.07						1115.07	
E. Prescribed burning of savannas		NO	NO						NO	
F. Field burning of agricultural residues		NO	NO						NO	
G. Liming	NO								NO	
H. Urea application	75.94								75.94	
I. Other carbon-containing fertilizers	NA								NA	
J. Other	NO	NO	NO						NO	
4. Land use, land-use change and forestry⁽¹⁾	-7839.11	3.27	69.67						-7766.17	
A. Forest land	-8203.34	2.19	1.82						-8199.33	
B. Cropland	154.68	NO	8.51						163.19	
C. Grassland	-59.71	1.08	14.89						-43.74	
D. Wetlands	26.55	NO	3.70						30.25	
E. Settlements	423.02	NO	40.75						463.76	
F. Other land	NO	NO	NO						NO	
G. Harvested wood products	-180.30								-180.30	
H. Other	NO	NO	NO						NO	
5. Waste	0.35	1566.66	71.31						1638.31	
A. Solid waste disposal	NA,NO	948.43							948.43	
B. Biological treatment of solid waste		0.81	0.46						1.28	
C. Incineration and open burning of waste	0.35	8.81	1.93						11.08	
D. Waste water treatment and discharge		608.60	68.92						677.52	
E. Other	NO	NO	NO						NO	
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Memo items:⁽²⁾										
International bunkers	284.43	0.23	2.07						286.73	
Aviation	210.59	0.04	1.56						212.19	
Navigation	73.83	0.19	0.51						74.54	
Multilateral operations	C	C	C						C	
CO₂ emissions from biomass	5660.22								5660.22	
CO₂ captured	NO								NO	
Long-term storage of C in waste disposal sites	6883.81								6883.81	
Indirect N₂O			NA,NO							
Indirect CO₂⁽³⁾	NA,NO									
	Total CO₂ equivalent emissions without land use, land-use change and forestry									29497.65
	Total CO₂ equivalent emissions with land use, land-use change and forestry									21731.48
	Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
	Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

Table A5.2-17: GHG emission in Croatia, 2005

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2005
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15213.54	4284.25	2260.61	186.49	NO	14.70	NO	NO	21959.59
I. Energy	20613.73	750.26	217.43						21581.42
A. Fuel combustion (sectoral approach)	19856.99	471.66	217.19						20545.84
1. Energy industries	6810.03	5.16	20.33						6835.53
2. Manufacturing industries and construction	3681.10	6.01	8.72						3695.83
3. Transport	5467.69	27.92	67.45						5563.06
4. Other sectors	3898.16	432.57	120.69						4451.43
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	756.74	278.60	0.24						1035.58
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	756.74	278.60	0.24						1035.58
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2598.62	4.22	594.51	186.49	NO	14.70	NO	NO	3398.54
A. Mineral industry	1809.90								1809.90
B. Chemical industry	663.60	4.22	566.23	NO	NO	NO	NO	NO	1234.06
C. Metal industry	12.71	NA,NO	NO	NO	NO	NO	NO	NO	12.71
D. Non-energy products from fuels and solvent use	112.41	NA	NA						112.41
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				186.49	NO	NO	NO	NO	186.49
G. Other product manufacture and use	NO	NO	28.28	NO	NO	14.70	NO	NO	42.98
H. Other	NA	NA	NA						NA
3. Agriculture	85.46	1980.23	1296.14						3361.83
A. Enteric fermentation		1458.81							1458.81
B. Manure management		521.42	160.19						681.61
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1135.95						1135.95
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.49								14.49
H. Urea application	70.97								70.97
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-8084.44	3.06	78.12						-8003.25
A. Forest land	-8313.88	2.42	2.35						-8309.11
B. Cropland	156.01	NO	8.87						164.88
C. Grassland	-60.56	0.64	17.66						-42.26
D. Wetlands	23.28	NO	3.24						26.51
E. Settlements	459.44	NO	46.01						505.44
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-348.72								-348.72
H. Other	NO	NO	NO						NO
5. Waste	0.16	1546.47	74.41						1621.05
A. Solid waste disposal	NA,NO	930.95							930.95
B. Biological treatment of solid waste		1.47	0.84						2.31
C. Incineration and open burning of waste	0.16	8.76	1.91						10.83
D. Waste water treatment and discharge		605.29	71.66						676.95
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	337.55	0.26	2.47						340.27
Aviation	257.74	0.05	1.91						259.70
Navigation	79.82	0.21	0.56						80.58
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5908.79								5908.79
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	7228.16								7228.16
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									29962.84
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									21959.59
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-18: GHG emission in Croatia, 2006

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2006
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15586.88	4414.39	2281.99	241.85	NO	14.57	NO	NO	22539.68
1. Energy	20683.71	732.34	217.67						21633.73
A. Fuel combustion (sectoral approach)	19917.74	435.17	217.44						20570.35
1. Energy industries	6631.42	5.40	20.06						6656.87
2. Manufacturing industries and construction	3806.68	6.38	9.26						3822.32
3. Transport	5820.94	26.79	70.17						5917.90
4. Other sectors	3658.71	396.60	117.95						4173.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	765.97	297.17	0.24						1063.38
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	765.97	297.17	0.24						1063.38
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2734.00	4.10	587.03	241.85	NO	14.57	NO	NO	3581.55
A. Mineral industry	1938.74								1938.74
B. Chemical industry	657.88	4.10	559.63	NO	NO	NO	NO	NO	1221.62
C. Metal industry	13.31	NA,NO	NO	NO	NO	NO	NO	NO	13.31
D. Non-energy products from fuels and solvent use	124.06	NA	NA						124.06
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				241.85	NO	NO	NO	NO	241.85
G. Other product manufacture and use	NO	NO	27.40	NO	NO	14.57	NO	NO	41.97
H. Other	NA	NA	NA						NA
3. Agriculture	80.67	2042.96	1312.15						3435.77
A. Enteric fermentation		1456.68							1456.68
B. Manure management		586.27	165.86						752.14
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1146.28						1146.28
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	17.48								17.48
H. Urea application	63.19								63.19
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7912.24	6.79	88.67						-7816.78
A. Forest land	-8180.56	6.12	4.67						-8169.77
B. Cropland	157.78	NO	9.23						167.00
C. Grassland	-83.61	0.67	20.73						-62.21
D. Wetlands	20.01	NO	2.77						22.78
E. Settlements	497.12	NO	51.27						548.39
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-322.96								-322.96
H. Other	NO	NO	NO						NO
5. Waste	0.74	1628.21	76.46						1705.41
A. Solid waste disposal	NA,NO	1007.91							1007.91
B. Biological treatment of solid waste		1.14	0.65						1.79
C. Incineration and open burning of waste	0.74	8.99	1.97						11.70
D. Waste water treatment and discharge		610.17	73.84						684.01
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	325.65	0.21	2.39						328.25
Aviation	264.02	0.05	1.96						266.03
Navigation	61.63	0.16	0.43						62.21
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5497.41								5497.41
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	7635.86								7635.86
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									30356.47
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									22539.68
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-19: GHG emission in Croatia, 2007

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2007
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	17991.42	4442.83	2351.25	318.18	NO	14.59	NO	NO	25118.27
1. Energy	21909.53	728.78	222.68						22860.99
A. Fuel combustion (sectoral approach)	21181.93	420.22	222.45						21824.60
1. Energy industries	7815.15	6.24	24.11						7845.50
2. Manufacturing industries and construction	3797.32	6.43	9.22						3812.98
3. Transport	6242.17	25.95	73.06						6341.18
4. Other sectors	3327.29	381.60	116.06						3824.94
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	727.60	308.56	0.23						1036.39
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	727.60	308.56	0.23						1036.39
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2805.17	3.82	644.01	318.18	NO	14.59	NO	NO	3785.76
A. Mineral industry	1966.71								1966.71
B. Chemical industry	696.32	3.82	617.48	NO	NO	NO	NO	NO	1317.62
C. Metal industry	13.69	NA,NO	NO	NO	NO	NO	NO	NO	13.69
D. Non-energy products from fuels and solvent use	128.45	NA	NA						128.45
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				318.18	NO	NO	NO	NO	318.18
G. Other product manufacture and use	NO	NO	26.53	NO	NO	14.59	NO	NO	41.11
H. Other	NA	NA	NA						NA
3. Agriculture	89.32	1967.76	1291.60						3348.68
A. Enteric fermentation		1400.89							1400.89
B. Manure management		566.87	155.48						722.35
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1136.12						1136.12
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	16.60								16.60
H. Urea application	72.72								72.72
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6813.25	35.58	114.69						-6662.98
A. Forest land	-7341.06	33.14	19.35						-7288.56
B. Cropland	368.82	NO	11.46						380.28
C. Grassland	-101.08	2.43	25.01						-73.63
D. Wetlands	17.54	NO	2.35						19.89
E. Settlements	551.88	NO	56.52						608.40
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-309.35								-309.35
H. Other	NO	NO	NO						NO
5. Waste	0.65	1706.91	78.26						1785.82
A. Solid waste disposal	NA,NO	1078.98							1078.98
B. Biological treatment of solid waste		2.52	1.43						3.94
C. Incineration and open burning of waste	0.65	9.32	2.04						12.01
D. Waste water treatment and discharge		616.10	74.79						690.89
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	353.05	0.25	2.58						355.87
Aviation	276.60	0.05	2.05						278.70
Navigation	76.45	0.20	0.53						77.17
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5322.60								5322.60
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	8138.55								8138.55
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31781.25
Total CO₂ equivalent emissions with land use, land-use change and forestry									25118.27
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

Table A5.2-20: GHG emission in Croatia, 2008

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2008
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	16534.07	4413.18	2613.47	388.68	NO	13.39	NO	NO	23962.79
I. Energy	20727.44	714.59	218.76						21660.79
A. Fuel combustion (sectoral approach)	20090.63	418.46	218.54						20727.62
1. Energy industries	6771.62	5.37	21.53						6798.52
2. Manufacturing industries and construction	3798.07	6.18	8.89						3813.13
3. Transport	6079.11	23.92	68.16						6171.19
4. Other sectors	3441.83	382.99	119.96						3944.78
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	636.82	296.13	0.22						933.17
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	636.82	296.13	0.22						933.17
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2695.44	3.62	656.84	388.68	NO	13.39	NO	NO	3757.97
A. Mineral industry	1868.34								1868.34
B. Chemical industry	676.64	3.62	631.19	NO	NO	NO	NO	NO	1311.45
C. Metal industry	23.41	NA,NO	NO	NO	NO	NO	NO	NO	23.41
D. Non-energy products from fuels and solvent use	127.05	NA	NA						127.05
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				388.68	NO	NO	NO	NO	388.68
G. Other product manufacture and use	NO	NO	25.65	NO	NO	13.39	NO	NO	39.04
H. Other	NA	NA	NA						NA
3. Agriculture	96.60	1870.77	1548.59						3515.96
A. Enteric fermentation		1347.72							1347.72
B. Manure management		523.05	143.47						666.52
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1405.12						1405.12
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	20.78								20.78
H. Urea application	75.83								75.83
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6986.09	10.73	110.03						-6865.33
A. Forest land	-7522.53	9.68	7.32						-7505.54
B. Cropland	389.41	NO	13.69						403.10
C. Grassland	-131.78	1.05	25.35						-105.37
D. Wetlands	14.53	NO	1.92						16.45
E. Settlements	589.62	NO	61.75						651.38
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-325.34								-325.34
H. Other	NO	NO	NO						NO
5. Waste	0.67	1813.47	79.25						1893.39
A. Solid waste disposal	NA,NO	1192.89							1192.89
B. Biological treatment of solid waste		2.45	1.39						3.85
C. Incineration and open burning of waste	0.67	9.54	2.09						12.30
D. Waste water treatment and discharge		608.59	75.77						684.36
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	384.96	0.23	2.82						388.01
Aviation	317.46	0.06	2.35						319.87
Navigation	67.50	0.17	0.46						68.14
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5298.65								5298.65
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	8674.96								8674.96
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									30828.12
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									23962.79
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-21: GHG emission in Croatia, 2009

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2009
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	14661.56	4509.24	2055.94	469.94	NO	9.63	NO	NO	21706.30
I. Energy	19593.01	719.86	212.47						20525.34
A. Fuel combustion (sectoral approach)	19019.15	432.61	212.26						19664.02
1. Energy industries	6365.42	5.34	18.68						6389.44
2. Manufacturing industries and construction	3108.28	5.86	8.20						3122.34
3. Transport	6091.06	22.69	66.50						6180.25
4. Other sectors	3454.39	398.72	118.88						3971.99
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	573.86	287.25	0.21						861.32
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	573.86	287.25	0.21						861.32
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2086.35	3.26	551.63	469.94	NO	9.63	NO	NO	3120.80
A. Mineral industry	1455.41								1455.41
B. Chemical industry	529.27	3.26	527.51	NO	NO	NO	NO	NO	1060.04
C. Metal industry	4.84	NA,NO	NO	NO	NO	NO	NO	NO	4.84
D. Non-energy products from fuels and solvent use	96.83	NA	NA						96.83
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				469.94	NO	NO	NO	NO	469.94
G. Other product manufacture and use	NO	NO	24.11	NO	NO	9.63	NO	NO	33.74
H. Other	NA	NA	NA						NA
3. Agriculture	76.96	1896.76	1093.67						3067.39
A. Enteric fermentation		1333.59							1333.59
B. Manure management		563.17	146.82						709.99
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	946.85						946.85
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	11.92								11.92
H. Urea application	65.04								65.04
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7094.93	5.71	117.82						-6971.40
A. Forest land	-7901.15	5.46	5.72						-7889.97
B. Cropland	429.56	NO	15.92						445.48
C. Grassland	-129.26	0.25	27.68						-101.33
D. Wetlands	11.51	NO	1.49						13.00
E. Settlements	673.38	NO	67.00						740.39
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-178.97								-178.97
H. Other	NO	NO	NO						NO
5. Waste	0.16	1883.65	80.36						1964.17
A. Solid waste disposal	NA,NO	1301.20							1301.20
B. Biological treatment of solid waste		2.13	1.17						3.30
C. Incineration and open burning of waste	0.16	9.51	2.08						11.75
D. Waste water treatment and discharge		570.81	77.11						647.92
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	292.16	0.11	2.15						294.42
Aviation	270.31	0.05	2.00						272.37
Navigation	21.85	0.06	0.15						22.06
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5576.02								5576.02
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	9189.07								9189.07
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									28677.70
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									21706.30
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-22: GHG emission in Croatia, 2010

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2010
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13950.64	4572.65	2285.43	563.88	NO	10.13	NO	NO	21382.74
I. Energy	18774.65	748.54	210.28						19733.47
A. Fuel combustion (sectoral approach)	18233.13	460.07	210.08						18903.28
1. Energy industries	5877.34	4.86	19.32						5901.52
2. Manufacturing industries and construction	2983.81	5.80	8.02						2997.63
3. Transport	5865.78	20.46	62.51						5948.75
4. Other sectors	3506.21	428.94	120.24						4055.39
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	541.52	288.47	0.20						830.19
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	541.52	288.47	0.20						830.19
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2123.51	3.05	704.20	563.88	NO	10.13	NO	NO	3404.77
A. Mineral industry	1403.71								1403.71
B. Chemical industry	615.36	3.05	680.28	NO	NO	NO	NO	NO	1298.69
C. Metal industry	14.68	NA,NO	NO	NO	NO	NO	NO	NO	14.68
D. Non-energy products from fuels and solvent use	89.76	NA	NA						89.76
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				563.88	NO	NO	NO	NO	563.88
G. Other product manufacture and use	NO	NO	23.91	NO	NO	10.13	NO	NO	34.05
H. Other	NA	NA	NA						NA
3. Agriculture	88.04	1884.16	1162.85						3135.04
A. Enteric fermentation		1303.76							1303.76
B. Manure management		580.40	141.44						721.84
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1021.41						1021.41
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	21.46								21.46
H. Urea application	66.58								66.58
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-7035.61	1.97	126.80						-6906.83
A. Forest land	-7757.76	1.84	4.52						-7751.39
B. Cropland	439.81	NO	18.15						457.97
C. Grassland	-149.40	0.13	30.82						-118.44
D. Wetlands	8.49	NO	1.06						9.56
E. Settlements	672.40	NO	72.25						744.64
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-249.16								-249.16
H. Other	NO	NO	NO						NO
5. Waste	0.05	1934.93	81.30						2016.29
A. Solid waste disposal	NA,NO	1324.36							1324.36
B. Biological treatment of solid waste		2.41	1.26						3.67
C. Incineration and open burning of waste	0.05	9.65	2.11						11.80
D. Waste water treatment and discharge		598.52	77.93						676.45
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	315.09	0.11	2.33						317.52
Aviation	295.46	0.06	2.19						297.70
Navigation	19.64	0.05	0.14						19.82
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5940.55								5940.55
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	9706.91								9706.91
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									28289.57
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									21382.74
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-23: GHG emission in Croatia, 2011

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2011
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	14822.38	4557.76	2358.16	625.90	NO	10.57	NO	NO	22374.77
1. Energy	18565.66	713.33	198.27						19477.26
A. Fuel combustion (sectoral approach)	18006.77	447.33	198.09						18652.19
1. Energy industries	6247.86	5.62	20.45						6273.94
2. Manufacturing industries and construction	2750.09	5.09	7.05						2762.23
3. Transport	5726.93	18.81	51.81						5797.54
4. Other sectors	3281.90	417.81	118.78						3818.48
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	558.89	266.01	0.18						825.07
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	558.89	266.01	0.18						825.07
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1949.74	1.96	693.97	625.90	NO	10.57	NO	NO	3282.14
A. Mineral industry	1255.57								1255.57
B. Chemical industry	593.19	1.96	670.44	NO	NO	NO	NO	NO	1265.59
C. Metal industry	16.64	NA,NO	NO	NO	NO	NO	NO	NO	16.64
D. Non-energy products from fuels and solvent use	84.35	NA	NA						84.35
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				625.90	NO	NO	NO	NO	625.90
G. Other product manufacture and use	NO	NO	23.53	NO	NO	10.57	NO	NO	34.10
H. Other	NA	NA	NA						NA
3. Agriculture	105.18	1837.98	1233.81						3176.97
A. Enteric fermentation		1277.73							1277.73
B. Manure management		560.25	132.32						692.57
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1101.49						1101.49
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	21.32								21.32
H. Urea application	83.86								83.86
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5798.26	20.86	150.15						-5627.24
A. Forest land	-6558.59	17.02	13.31						-6528.27
B. Cropland	464.84	NO	20.03						484.86
C. Grassland	-160.97	3.84	37.36						-119.77
D. Wetlands	8.52	NO	1.07						9.58
E. Settlements	716.71	NO	78.40						795.11
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-268.76								-268.76
H. Other	NO	NO	NO						NO
5. Waste	0.05	1983.63	81.96						2065.64
A. Solid waste disposal	NA,NO	1376.18							1376.18
B. Biological treatment of solid waste		2.58	1.32						3.89
C. Incineration and open burning of waste	0.05	9.19	2.01						11.25
D. Waste water treatment and discharge		595.67	78.64						674.31
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	387.14	0.25	2.83						390.22
Aviation	311.17	0.06	2.31						313.54
Navigation	75.97	0.19	0.52						76.69
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5834.09								5834.09
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	10217.80								10217.80
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									28002.01
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									22374.77
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-24: GHG emission in Croatia, 2012

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2012
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13653.65	4536.13	2179.75	699.22	NO	11.30	NO	NO	21080.05
1. Energy	17199.62	673.59	190.58						18063.79
A. Fuel combustion (sectoral approach)	16726.38	442.71	190.42						17359.51
1. Energy industries	5849.20	5.47	19.37						5874.04
2. Manufacturing industries and construction	2384.35	5.22	7.17						2396.75
3. Transport	5551.16	15.88	50.03						5617.07
4. Other sectors	2941.67	416.14	113.85						3471.65
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	473.24	230.88	0.16						704.28
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	473.24	230.88	0.16						704.28
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1755.36	NO,NE,IE,NA	601.62	699.22	NO	11.30	NO	NO	3067.50
A. Mineral industry	1173.23								1173.23
B. Chemical industry	502.01	NO,NE,IE	580.13	NO	NO	NO	NO	NO	1082.13
C. Metal industry	1.43	NA,NO	NO	NO	NO	NO	NO	NO	1.43
D. Non-energy products from fuels and solvent use	78.69	NA	NA						78.69
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				699.22	NO	NO	NO	NO	699.22
G. Other product manufacture and use	NO	NO	21.50	NO	NO	11.30	NO	NO	32.79
H. Other	NA	NA	NA						NA
3. Agriculture	101.23	1830.57	1129.60						3061.41
A. Enteric fermentation		1283.43							1283.43
B. Manure management		547.14	129.65						676.79
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	999.96						999.96
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.38								14.38
H. Urea application	86.85								86.85
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5402.65	43.55	173.23						-5185.87
A. Forest land	-6138.11	40.42	26.29						-6071.40
B. Cropland	482.88	NO	21.90						504.79
C. Grassland	-190.72	3.13	39.44						-148.16
D. Wetlands	8.55	NO	1.07						9.61
E. Settlements	754.58	NO	84.53						839.11
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-319.83								-319.83
H. Other	NO	NO	NO						NO
5. Waste	0.08	1988.42	84.71						2073.21
A. Solid waste disposal	NA,NO	1418.16							1418.16
B. Biological treatment of solid waste		4.81	2.43						7.25
C. Incineration and open burning of waste	0.08	8.89	1.94						10.91
D. Waste water treatment and discharge		556.56	80.33						636.89
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	342.53	0.10	2.53						345.16
Aviation	330.03	0.06	2.45						332.54
Navigation	12.50	0.03	0.09						12.62
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6011.36								6011.36
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	10673.44								10673.44
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									26265.92
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									21080.05
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-25: GHG emission in Croatia, 2013

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2013
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12098.84	4383.85	1639.33	764.81	NO	7.40	NO	NO	18894.23
I. Energy	16466.37	658.48	187.28						17312.13
A. Fuel combustion (sectoral approach)	16013.57	438.88	187.12						16639.58
1. Energy industries	5238.07	4.66	18.60						5261.34
2. Manufacturing industries and construction	2359.25	5.01	6.95						2371.21
3. Transport	5636.55	15.67	49.63						5701.85
4. Other sectors	2779.70	413.54	111.94						3305.18
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	452.80	219.60	0.16						672.55
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	452.80	219.60	0.16						672.55
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1865.05	NO,NE,IE,NA	233.40	764.81	NO	7.40	NO	NO	2870.65
A. Mineral industry	1271.22								1271.22
B. Chemical industry	509.33	NO,NE,IE	213.66	NO	NO	NO	NO	NO	722.99
C. Metal industry	13.93	NA,NO	NO	NO	NO	NO	NO	NO	13.93
D. Non-energy products from fuels and solvent use	70.57	NA	NA						70.57
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				764.81	NO	NO	NO	NO	764.81
G. Other product manufacture and use	NO	NO	19.73	NO	NO	7.40	NO	NO	27.13
H. Other	NA	NA	NA						NA
3. Agriculture	74.61	1748.53	977.74						2800.88
A. Enteric fermentation		1230.76							1230.76
B. Manure management		517.77	121.34						639.11
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	856.40						856.40
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.23								14.23
H. Urea application	60.39								60.39
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6307.24	2.16	154.57						-6150.51
A. Forest land	-6621.12	1.63	7.00						-6612.49
B. Cropland	294.91	NO	21.42						316.32
C. Grassland	-219.29	0.53	40.06						-178.71
D. Wetlands	9.41	NO	1.11						10.52
E. Settlements	655.04	NO	84.98						740.02
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-426.18								-426.18
H. Other	NO	NO	NO						NO
5. Waste	0.04	1974.69	86.35						2061.08
A. Solid waste disposal	NA,NO	1415.15							1415.15
B. Biological treatment of solid waste		6.12	3.39						9.51
C. Incineration and open burning of waste	0.04	8.47	1.85						10.36
D. Waste water treatment and discharge		544.94	81.10						626.05
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	379.01	0.10	2.77						381.88
Aviation	366.52	0.07	2.68						369.27
Navigation	12.50	0.03	0.09						12.62
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5975.40								5975.40
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	11137.56								11137.56
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									25044.74
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									18894.23
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-26: GHG emission in Croatia, 2014

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2014
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	
SINK CATEGORIES	CO ₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	11495.89	4345.64	1610.36	850.23	NO	7.91	NO	NO	18310.03	
I. Energy	15596.95	591.92	176.43						16365.30	
A. Fuel combustion (sectoral approach)	15155.79	386.90	176.28						15718.97	
1. Energy industries	4743.91	3.62	15.96						4763.49	
2. Manufacturing industries and construction	2300.57	4.28	5.99						2310.84	
3. Transport	5580.73	14.64	48.72						5644.09	
4. Other sectors	2530.59	364.36	105.61						3000.56	
5. Other	NO,IE	NO,IE	NO,IE						NO,IE	
B. Fugitive emissions from fuels	441.16	205.02	0.15						646.33	
1. Solid fuels	NO	NO	NA,NO						NO,NA	
2. Oil and natural gas	441.16	205.02	0.15						646.33	
C. CO ₂ transport and storage	NO								NO	
2. Industrial processes and product use	1990.73	NO,NE,IE,NA	254.43	850.23	NO	7.91	NO	NO	3103.29	
A. Mineral industry	1354.11								1354.11	
B. Chemical industry	559.83	NO,NE,IE	236.72	NO	NO	NO	NO	NO	796.55	
C. Metal industry	10.11	NA,NO	NO	NO	NO	NO	NO	NO	10.11	
D. Non-energy products from fuels and solvent use	66.67	NA	NA						66.67	
E. Electronic industry				NO	NO	NO	NO	NO	NO	
F. Product uses as ODS substitutes				850.23	NO	NO	NO	NO	850.23	
G. Other product manufacture and use	NO	NO	17.71	NO	NO	7.91	NO	NO	25.62	
H. Other	NA	NA	NA						NA	
3. Agriculture	69.47	1731.88	934.83						2736.18	
A. Enteric fermentation		1213.29							1213.29	
B. Manure management		518.59	123.46						642.05	
C. Rice cultivation		NO							NO	
D. Agricultural soils		NE	811.37						811.37	
E. Prescribed burning of savannas		NO	NO						NO	
F. Field burning of agricultural residues		NO	NO						NO	
G. Liming	19.99								19.99	
H. Urea application	49.47								49.47	
I. Other carbon-containing fertilizers	NA								NA	
J. Other	NO	NO	NO						NO	
4. Land use, land-use change and forestry⁽¹⁾	-6161.30	0.36	158.22						-6002.72	
A. Forest land	-6339.54	0.24	7.49						-6331.80	
B. Cropland	287.18	0.09	20.97						308.24	
C. Grassland	-233.84	0.03	43.15						-190.66	
D. Wetlands	9.69	NO	1.15						10.84	
E. Settlements	653.81	NO	85.45						739.26	
F. Other land	NO	NO	NO						NO	
G. Harvested wood products	-538.61								-538.61	
H. Other	NO	NO	NO						NO	
5. Waste	0.04	2021.49	86.45						2107.98	
A. Solid waste disposal	NA,NO	1461.15							1461.15	
B. Biological treatment of solid waste		7.94	3.50						11.44	
C. Incineration and open burning of waste	0.04	8.50	1.86						10.40	
D. Waste water treatment and discharge		543.90	81.10						625.00	
E. Other	NO	NO	NO						NO	
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Memo items:⁽²⁾										
International bunkers	383.77	0.11	2.80						386.68	
Aviation	368.10	0.07	2.69						370.87	
Navigation	15.66	0.04	0.11						15.81	
Multilateral operations	C	C	C						C	
CO ₂ emissions from biomass	5245.05								5245.05	
CO ₂ captured	NO								NO	
Long-term storage of C in waste disposal sites	11564.66								11564.66	
Indirect N ₂ O			NA,NO							
Indirect CO ₂ ⁽³⁾	NA,NO									
				Total CO ₂ equivalent emissions without land use, land-use change and forestry						24312.76
				Total CO ₂ equivalent emissions with land use, land-use change and forestry						18310.03
				Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry						NA
				Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry						NA

Table A5.2-27: GHG emission in Croatia, 2015

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2015
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11925.32	4458.04	1745.14	944.27	NO	5.75	NO	NO	19078.52
I. Energy	15777.74	657.39	185.77						16620.90
A. Fuel combustion (sectoral approach)	15528.20	440.29	185.60						16154.09
1. Energy industries	4718.82	4.63	17.44						4740.89
2. Manufacturing industries and construction	2201.79	3.71	5.28						2210.78
3. Transport	5887.78	14.15	50.19						5952.13
4. Other sectors	2719.81	417.80	112.68						3250.30
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	249.54	217.10	0.17						466.80
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	249.54	217.10	0.17						466.80
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1955.88	NO,NE,IE,NA	294.77	944.27	NO	5.75	NO	NO	3200.67
A. Mineral industry	1306.35								1306.35
B. Chemical industry	572.27	NO,NE,IE	276.87	NO	NO	NO	NO	NO	849.14
C. Metal industry	9.30	NA,NO	NO	NO	NO	NO	NO	NO	9.30
D. Non-energy products from fuels and solvent use	67.95	NA	NA						67.95
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				944.27	NO	NO	NO	NO	944.27
G. Other product manufacture and use	NO	NO	17.90	NO	NO	5.75	NO	NO	23.65
H. Other	NA	NA	NA						NA
3. Agriculture	69.34	1714.43	1003.43						2787.20
A. Enteric fermentation		1193.79							1193.79
B. Manure management		520.64	121.10						641.74
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	882.33						882.33
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	12.09								12.09
H. Urea application	57.25								57.25
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5877.69	15.64	170.14						-5691.90
A. Forest land	-5858.37	11.00	14.12						-5833.25
B. Cropland	337.20	2.89	21.96						362.04
C. Grassland	-269.86	1.75	46.97						-221.14
D. Wetlands	9.98	NO	1.19						11.17
E. Settlements	667.52	NO	85.90						753.42
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-764.15								-764.15
H. Other	NO	NO	NO						NO
5. Waste	0.05	2070.57	91.03						2161.65
A. Solid waste disposal	NA,NO	1506.11							1506.11
B. Biological treatment of solid waste		12.59	5.56						18.15
C. Incineration and open burning of waste	0.05	8.25	1.80						10.10
D. Waste water treatment and discharge		543.62	83.67						627.29
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	365.05	0.10	2.67						367.81
Aviation	354.08	0.07	2.59						356.74
Navigation	10.97	0.03	0.08						11.07
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6006.75								6006.75
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	12002.82								12002.82
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									24770.42
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									19078.52
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-27: GHG emission in Croatia, 2016

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2016
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12214.60	4427.29	1515.55	1079.83	NO	6.80	NO	NO	19244.07
I. Energy	16190.57	647.66	188.20						17026.43
A. Fuel combustion (sectoral approach)	15953.85	428.91	188.01						16570.77
1. Energy industries	4846.79	6.10	20.48						4873.38
2. Manufacturing industries and construction	2210.60	3.22	4.63						2218.45
3. Transport	6106.38	13.68	52.28						6172.34
4. Other sectors	2790.08	405.91	110.62						3306.60
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	236.72	218.75	0.18						455.66
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	236.72	218.75	0.18						455.66
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1823.19	NO,NE,IE,NA	114.55	1079.83	NO	6.80	NO	NO	3024.37
A. Mineral industry	1201.30								1201.30
B. Chemical industry	547.86	NO,NE,IE	97.25	NO	NO	NO	NO	NO	645.11
C. Metal industry	1.05	NO,NA	NO	NO	NO	NO	NO	NO	1.05
D. Non-energy products from fuels and solvent use	72.97	NA	NA						72.97
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1079.83	NO	NO	NO	NO	1079.83
G. Other product manufacture and use	NO	NO	17.30	NO	NO	6.80	NO	NO	24.10
H. Other	NA	NA	NA						NA
3. Agriculture	76.17	1699.71	955.23						2731.11
A. Enteric fermentation		1195.55							1195.55
B. Manure management		504.15	121.16						625.31
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	834.08						834.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	11.20								11.20
H. Urea application	64.96								64.96
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5875.38	9.99	167.19						-5698.21
A. Forest land	-5737.72	8.31	12.87						-5716.53
B. Cropland	282.51	0.06	19.99						302.55
C. Grassland	-308.22	1.62	46.73						-259.87
D. Wetlands	10.27	NO	1.23						11.50
E. Settlements	657.85	NO	86.36						744.22
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-780.07								-780.07
H. Other	NO	NO	NO						NO
5. Waste	0.05	2069.94	90.39						2160.38
A. Solid waste disposal	NO,NA	1503.46							1503.46
B. Biological treatment of solid waste		11.62	3.24						14.86
C. Incineration and open burning of waste	0.05	7.63	1.67						9.34
D. Waste water treatment and discharge		547.23	85.48						632.71
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	388.96	0.11	2.84						391.91
Aviation	375.75	0.07	2.75						378.57
Navigation	13.21	0.03	0.09						13.34
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5970.35								5970.35
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	12416.99								12416.99
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
				Total CO ₂ equivalent emissions without land use, land-use change and forestry					24942.28
				Total CO ₂ equivalent emissions with land use, land-use change and forestry					19244.07
				Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry					NA
				Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry					NA

Table A5.2-27: GHG emission in Croatia, 2017

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2017
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13551.11	4456.91	1661.05	1225.33	NO	7.23	NO	NO	20901.63
I. Energy	16574.03	636.75	189.08						17399.86
A. Fuel combustion (sectoral approach)	16262.44	419.66	188.90						16870.99
1. Energy industries	4464.77	7.74	19.16						4491.67
2. Manufacturing industries and construction	2405.83	3.92	5.55						2415.29
3. Transport	6570.29	13.41	55.02						6638.72
4. Other sectors	2821.56	394.59	109.17						3325.31
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	311.59	217.10	0.18						528.88
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	311.59	217.10	0.18						528.88
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2063.94	NO,NE,IE,NA	105.24	1225.33	NO	7.23	NO	NO	3401.75
A. Mineral industry	1425.61								1425.61
B. Chemical industry	566.79	NO,NE,IE	87.68	NO	NO	NO	NO	NO	654.47
C. Metal industry	1.87	NO,NA	NO	NO	NO	NO	NO	NO	1.87
D. Non-energy products from fuels and solvent use	69.68	NA	NA						69.68
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1225.33	NO	NO	NO	NO	1225.33
G. Other product manufacture and use	NO	NO	17.56	NO	NO	7.23	NO	NO	24.80
H. Other	NA	NA	NA						NA
3. Agriculture	81.13	1679.48	1069.18						2829.79
A. Enteric fermentation		1192.32							1192.32
B. Manure management		487.16	119.85						607.01
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	949.33						949.33
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	10.92								10.92
H. Urea application	70.21								70.21
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5167.99	77.54	206.77						-4883.68
A. Forest land	-4797.25	68.56	44.92						-4683.77
B. Cropland	281.71	0.54	19.76						302.01
C. Grassland	-295.00	8.45	53.98						-232.57
D. Wetlands	10.56	NO	1.27						11.83
E. Settlements	661.34	NO	86.83						748.18
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-1029.35								-1029.35
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	2063.13	90.78						2153.91
A. Solid waste disposal	NO,NA	1527.46							1527.46
B. Biological treatment of solid waste		10.21	3.66						13.87
C. Incineration and open burning of waste	NO	6.87	1.50						8.37
D. Waste water treatment and discharge		518.60	85.62						604.22
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	469.17	0.14	3.42						472.73
Aviation	449.06	0.09	3.28						452.43
Navigation	20.11	0.05	0.14						20.31
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5906.57								5906.57
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	12817.80								12817.80
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									25785.32
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									20901.63
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-27: GHG emission in Croatia, 2018

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2018
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	
SINK CATEGORIES	CO ₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	12043.79	4185.80	1578.38	1352.41	NO	6.46	NO	NO	19166.84	
I. Energy	15671.07	601.43	187.51						16460.01	
A. Fuel combustion (sectoral approach)	15386.44	402.19	187.34						15975.97	
1. Energy industries	3907.81	8.78	19.76						3936.35	
2. Manufacturing industries and construction	2390.76	4.16	5.85						2400.78	
3. Transport	6340.78	12.49	53.29						6406.56	
4. Other sectors	2747.08	376.75	108.44						3232.27	
5. Other	NO,IE	NO,IE	NO,IE						NO,IE	
B. Fugitive emissions from fuels	284.64	199.24	0.17						484.05	
1. Solid fuels	NO	NO	NO,NA						NO,NA	
2. Oil and natural gas	284.64	199.24	0.17						484.05	
C. CO ₂ transport and storage	NO								NO	
2. Industrial processes and product use	1959.25	NO,NE,IE,NA	60.88	1352.41	NO	6.46	NO	NO	3379.00	
A. Mineral industry	1358.42								1358.42	
B. Chemical industry	513.06	NO,NE,IE	44.56	NO	NO	NO	NO	NO	557.62	
C. Metal industry	8.99	NO,NA	NO	NO	NO	NO	NO	NO	8.99	
D. Non-energy products from fuels and solvent use	78.78	NA	NA						78.78	
E. Electronic industry				NO	NO	NO	NO	NO	NO	
F. Product uses as ODS substitutes				1352.41	NO	NO	NO	NO	1352.41	
G. Other product manufacture and use			16.32	NO	NO	6.46	NO	NO	22.78	
H. Other	NA	NA	NA						NA	
3. Agriculture	72.24	1571.91	1072.54						2716.69	
A. Enteric fermentation		1118.35							1118.35	
B. Manure management		453.56	111.49						565.05	
C. Rice cultivation		NO							NO	
D. Agricultural soils		NE	961.04						961.04	
E. Prescribed burning of savannas		NO	NO						NO	
F. Field burning of agricultural residues		NO	NO						NO	
G. Liming	4.62								4.62	
H. Urea application	67.62								67.62	
I. Other carbon-containing fertilizers	NA								NA	
J. Other	NO	NO	NO						NO	
4. Land use, land-use change and forestry⁽¹⁾	-5658.78	1.46	164.54						-5492.78	
A. Forest land	-5528.86	0.94	9.72						-5518.20	
B. Cropland	271.85	0.01	18.99						290.85	
C. Grassland	-315.53	0.50	47.21						-267.82	
D. Wetlands	10.84	NO	1.31						12.16	
E. Settlements	664.58	NO	87.31						751.88	
F. Other land	NO	NO	NO						NO	
G. Harvested wood products	-761.66								-761.66	
H. Other	NO	NO	NO						NO	
5. Waste	NO,NA	2011.00	92.92						2103.93	
A. Solid waste disposal	NO,NA	1495.06							1495.06	
B. Biological treatment of solid waste		9.05	4.21						13.26	
C. Incineration and open burning of waste	NO	7.15	1.56						8.71	
D. Waste water treatment and discharge		499.75	87.15						586.90	
E. Other	NO	NO	NO						NO	
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Memo items:⁽²⁾										
International bunkers	624.92	0.28	4.55						629.75	
Aviation	559.65	0.11	4.09						563.85	
Navigation	65.27	0.17	0.46						65.90	
Multilateral operations	C	C	C						C	
CO₂ emissions from biomass	6057.52								6057.52	
CO₂ captured	NO								NO	
Long-term storage of C in waste disposal sites	13193.91								13193.91	
Indirect N₂O			NO,NA							
Indirect CO₂⁽³⁾	NO,NA									
				Total CO₂ equivalent emissions without land use, land-use change and forestry						24659.63
				Total CO₂ equivalent emissions with land use, land-use change and forestry						19166.84
				Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry						NA
				Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry						NA

Table A5.2-27: GHG emission in Croatia, 2019

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2019
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11936.02	4111.31	1582.68	1466.75	NO	8.09	NO	NO	19104.85
1. Energy	15738.60	580.02	191.73						16510.36
A. Fuel combustion (sectoral approach)	15451.66	393.29	191.57						16036.53
1. Energy industries	3878.50	11.02	22.70						3912.23
2. Manufacturing industries and construction	2397.37	4.47	6.18						2408.02
3. Transport	6516.87	11.81	55.97						6584.66
4. Other sectors	2658.92	365.99	106.72						3131.63
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	286.94	186.73	0.16						473.83
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	286.94	186.73	0.16						473.83
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2016.03	NO,NE,IE,NA	60.74	1466.75	NO	8.09	NO	NO	3551.61
A. Mineral industry	1324.94								1324.94
B. Chemical industry	594.60	NO,NE,IE	44.55	NO	NO	NO	NO	NO	639.15
C. Metal industry	4.91	NO,NA	NO	NO	NO	NO	NO	NO	4.91
D. Non-energy products from fuels and solvent use	91.57	NA	NA						91.57
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1466.75	NO	NO	NO	NO	1466.75
G. Other product manufacture and use	NO	NO	16.19	NO	NO	8.09	NO	NO	24.28
H. Other	NA	NA	NA						NA
3. Agriculture	75.66	1561.23	1069.92						2706.80
A. Enteric fermentation		1119.03							1119.03
B. Manure management		442.20	112.55						554.75
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	957.37						957.37
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	2.07								2.07
H. Urea application	73.59								73.59
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5894.26	3.11	165.31						-5725.85
A. Forest land	-5773.02	2.58	10.61						-5759.84
B. Cropland	268.96	0.04	18.52						287.52
C. Grassland	-317.32	0.49	47.06						-269.77
D. Wetlands	11.13	NO	1.35						12.49
E. Settlements	668.15	NO	87.77						755.91
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-752.16								-752.16
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1966.95	94.98						2061.92
A. Solid waste disposal	NO,NA	1446.82							1446.82
B. Biological treatment of solid waste		9.83	4.48						14.31
C. Incineration and open burning of waste	NO	6.57	1.44						8.01
D. Waste water treatment and discharge		503.72	89.06						592.78
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	683.77	0.32	4.98						689.08
Aviation	605.86	0.12	4.43						610.41
Navigation	77.91	0.20	0.55						78.67
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6228.14								6228.14
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	13542.17								13542.17
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
	Total CO₂ equivalent emissions without land use, land-use change and forestry								
	Total CO₂ equivalent emissions with land use, land-use change and forestry								
	Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry								
	Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry								

Table A5.2-27: GHG emission in Croatia, 2020

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2020
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total	
SINK CATEGORIES	CO ₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	11002.74	4034.76	1636.79	1572.23	NO	9.35	NO	NO	18255.88	
I. Energy	14801.24	570.14	190.28						15561.66	
A. Fuel combustion (sectoral approach)	14513.05	397.68	190.14						15100.88	
1. Energy industries	3661.13	11.84	23.07						3696.05	
2. Manufacturing industries and construction	2392.56	5.08	6.91						2404.55	
3. Transport	5732.11	9.63	50.13						5791.86	
4. Other sectors	2727.25	371.13	110.03						3208.41	
5. Other	NO,IE	NO,IE	NO,IE						NO,IE	
B. Fugitive emissions from fuels	288.19	172.46	0.14						460.78	
1. Solid fuels	NO	NO	NO,NA						NO,NA	
2. Oil and natural gas	288.19	172.46	0.14						460.78	
C. CO ₂ transport and storage	NO								NO	
2. Industrial processes and product use	1985.19	NO,NE,IE,NA	75.60	1572.23	NO	9.35	NO	NO	3642.38	
A. Mineral industry	1359.34								1359.34	
B. Chemical industry	535.32	NO,NE,IE	57.87	NO	NO	NO	NO	NO	593.19	
C. Metal industry	4.93	NO,NA	NO	NO	NO	NO	NO	NO	4.93	
D. Non-energy products from fuels and solvent use	85.60	NA	NA						85.60	
E. Electronic industry				NO	NO	NO	NO	NO	NO	
F. Product uses as ODS substitutes				1572.23	NO	NO	NO	NO	1572.23	
G. Other product manufacture and use	NO	NO	17.73	NO	NO	9.35	NO	NO	27.08	
H. Other	NA	NA	NA						NA	
3. Agriculture	95.18	1514.65	1090.89						2700.72	
A. Enteric fermentation		1091.14							1091.14	
B. Manure management		423.50	111.26						534.76	
C. Rice cultivation		NO							NO	
D. Agricultural soils		NE	979.63						979.63	
E. Prescribed burning of savannas		NO	NO						NO	
F. Field burning of agricultural residues		NO	NO						NO	
G. Liming	6.89								6.89	
H. Urea application	88.29								88.29	
I. Other carbon-containing fertilizers	NA								NA	
J. Other	NO	NO	NO						NO	
4. Land use, land-use change and forestry⁽¹⁾	-5878.86	36.43	183.81						-5658.61	
A. Forest land	-5879.44	32.49	26.28						-5820.67	
B. Cropland	265.32	0.01	18.02						283.35	
C. Grassland	-317.91	3.93	49.88						-264.10	
D. Wetlands	11.42	NO	1.40						12.81	
E. Settlements	671.28	NO	88.24						759.53	
F. Other land	NO	NO	NO						NO	
G. Harvested wood products	-629.54								-629.54	
H. Other	NO	NO	NO						NO	
5. Waste	NO,NA	1913.54	96.20						2009.74	
A. Solid waste disposal	NO,NA	1440.90							1440.90	
B. Biological treatment of solid waste		13.74	6.36						20.11	
C. Incineration and open burning of waste	NO	6.58	1.44						8.01	
D. Waste water treatment and discharge		452.32	88.40						540.72	
E. Other	NO	NO	NO						NO	
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Memo items:⁽²⁾										
International bunkers	227.53	0.20	1.65						229.38	
Aviation	163.82	0.03	1.20						165.05	
Navigation	63.71	0.17	0.45						64.33	
Multilateral operations	C	C	C						C	
CO₂ emissions from biomass	6383.96								6383.96	
CO₂ captured	NO								NO	
Long-term storage of C in waste disposal sites	13849.55								13849.55	
Indirect N₂O			NO,NA							
Indirect CO₂⁽³⁾	NO,NA									
				Total CO₂ equivalent emissions without land use, land-use change and forestry						23914.49
				Total CO₂ equivalent emissions with land use, land-use change and forestry						18255.88
				Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry						NA
				Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry						NA

Table A5.2-28: GHG emission in Croatia, 2021

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2021
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11480.24	3882.39	1604.18	1697.01	NO	9.63	NO	NO	18673.45
1. Energy	15486.40	596.34	199.81						16282.55
A. Fuel combustion (sectoral approach)	15202.48	431.03	199.68						15833.18
1. Energy industries	3730.98	13.06	25.32						3769.36
2. Manufacturing industries and construction	2418.06	5.20	7.10						2430.36
3. Transport	6194.87	10.40	53.80						6259.07
4. Other sectors	2858.57	402.37	113.46						3374.39
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	283.92	165.31	0.14						449.37
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	283.92	165.31	0.14						449.37
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1832.01	NO,NE,IE,NA	53.14	1697.01	NO	9.63	NO	NO	3591.78
A. Mineral industry	1372.26								1372.26
B. Chemical industry	365.49	NO,NE,IE	36.27	NO	NO	NO	NO	NO	401.77
C. Metal industry	14.26	NO,NA	NO	NO	NO	NO	NO	NO	14.26
D. Non-energy products from fuels and solvent use	80.00	NA	NA						80.00
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1697.01	NO	NO	NO	NO	1697.01
G. Other product manufacture and use	NO	NO	16.87	NO	NO	9.63	NO	NO	26.49
H. Other	NA	NA	NA						NA
3. Agriculture	92.26	1501.01	1094.16						2687.42
A. Enteric fermentation		1079.31							1079.31
B. Manure management		421.70	106.13						527.83
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	988.03						988.03
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	18.70								18.70
H. Urea application	73.57								73.57
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5930.43	6.53	160.17						-5763.73
A. Forest land	-5867.98	4.75	11.78						-5851.45
B. Cropland	261.95	0.00	17.53						279.48
C. Grassland	-308.68	1.78	46.84						-260.06
D. Wetlands	11.93	NO	1.47						13.40
E. Settlements	628.64	NO	82.55						711.19
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-656.28								-656.28
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1778.52	96.90						1875.42
A. Solid waste disposal	NO,NA	1313.82							1313.82
B. Biological treatment of solid waste		15.65	7.37						23.03
C. Incineration and open burning of waste	NO	6.06	1.32						7.38
D. Waste water treatment and discharge		442.98	88.21						531.19
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	372.76	0.25	2.71						375.73
Aviation	298.31	0.06	2.18						300.55
Navigation	74.45	0.20	0.53						75.18
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	7049.25								7049.25
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	14147.77								14147.77
Indirect N ₂ O			NO,NA						
Indirect CO ₂ ⁽³⁾	NO,NA								
									Total CO₂ equivalent emissions without land use, land-use change and forestry
									24437.18
									Total CO₂ equivalent emissions with land use, land-use change and forestry
									18673.45
									Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry
									NA
									Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry
									NA

Table A5.2-28: GHG emission in Croatia, 2022

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2022
Submission 2024 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12534.15	3834.08	1494.54	1812.05	NO	10.00	NO	NO	19684.82
I. Energy	16121.65	548.51	201.56						16871.72
A. Fuel combustion (sectoral approach)	15765.56	393.25	201.43						16360.24
1. Energy industries	4062.71	14.50	29.03						4106.24
2. Manufacturing industries and construction	2313.06	4.86	6.71						2324.63
3. Transport	6667.33	8.65	54.96						6730.95
4. Other sectors	2722.45	365.23	110.74						3198.42
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	356.09	155.26	0.13						511.48
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	356.09	155.26	0.13						511.48
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1425.85	NO,NE,IE,NA	29.16	1812.05	NO	10.00	NO	NO	3277.06
A. Mineral industry	1255.47								1255.47
B. Chemical industry	83.90	NO,NE,IE	12.22	NO	NO	NO	NO	NO	96.12
C. Metal industry	13.39	NO,NA	NO	NO	NO	NO	NO	NO	13.39
D. Non-energy products from fuels and solvent use	73.09	NA	NA						73.09
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1812.05	NO	NO	NO	NO	1812.05
G. Other product manufacture and use	NO	NO	16.94	NO	NO	10.00	NO	NO	26.94
H. Other	NA	NA	NA						NA
3. Agriculture	60.71	1412.11	995.09						2467.91
A. Enteric fermentation		1020.85							1020.85
B. Manure management		391.25	103.38						494.64
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	891.71						891.71
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	18.70								18.70
H. Urea application	42.01								42.01
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-5074.06	37.15	169.75						-4867.16
A. Forest land	-5238.92	31.72	25.90						-5181.30
B. Cropland	262.52	0.27	17.20						279.98
C. Grassland	-302.36	5.16	48.28						-248.92
D. Wetlands	12.45	NO	1.54						13.99
E. Settlements	585.50	NO	76.83						662.34
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-393.25								-393.25
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1836.32	98.97						1935.29
A. Solid waste disposal	NO,NA	1391.69							1391.69
B. Biological treatment of solid waste		19.34	8.89						28.22
C. Incineration and open burning of waste	NO	5.94	1.30						7.23
D. Waste water treatment and discharge		419.35	88.79						508.14
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	623.87	0.26	4.54						628.68
Aviation	564.44	0.11	4.13						568.67
Navigation	59.44	0.15	0.42						60.01
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6532.67								6532.67
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	14489.48								14489.48
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
				Total CO ₂ equivalent emissions without land use, land-use change and forestry					24551.98
				Total CO ₂ equivalent emissions with land use, land-use change and forestry					19684.82
				Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry					NA
				Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry					NA

Annex 5-3: CO₂ emission factors, oxidation factors and national net calorific values

Table 5.3-1: National net calorific values, CO₂ emission factors and oxidation factors for 2021 (needed for monitoring and reporting on CO₂ emission)

Gorivo		DOV		CO ₂ Emisijski faktor (t CO ₂ /TJ)	Oksidacijski faktor (OF)
		Jedinica	2021		
Motorni benzin	Motor Gasoline	GJ/t	44.5900	69.30	1
Aviobenzin	Aviation Gasoline	GJ/t	44.5900	70.00	1
Kerozin (Mlazno gorivo)	Jet Kerosene	GJ/t	43.9600	71.50	1
Dizel i ekstra lako loživo ulje (plinsko ulje)	Gas/Diesel Oil	GJ/t	42.7100	74.10	1
Loživo ulje i srednje loživo ulje	Residual Fuel Oil	GJ/t	40.1900	77.40	1
Ukapljeni naftni plin	Liquefied Petroleum Gases	GJ/t	46.8900	63.10	1
Maziva	Lubricants	GJ/t	33.5000	73.30	1
Naftni koks	Petroleum Coke	GJ/t	31.0000	97.50	1
Petrolej	Petroleum	GJ/t	43.9600	73.30	1
Antracit	Anthracite	GJ/t	29.3100	98.30	1
<i>Kameni ugljen-Industrija</i>	<i>Other bituminous coal Industry</i>	GJ/t	26.7800	94.60	1
<i>Kameni ugljen-Termoelektrane</i>	<i>Other bituminous coal Thermal power plant</i>	GJ/t	24.7900	93.104	1
Ugljen za proizvodnju koksa (koksni ugljen)	Coking coal	GJ/t	28.2000	94.60	1
Mrki ugljen (smeđi ugljen) <i>Industrija</i>	<i>Sub bituminous coal Industry</i>	GJ/t	18.5000	96.10	1
Lignit	Lignite	GJ/t	11.5000	101.00	1
Briketi kamenog ugljena	Brown coal briquettes	GJ/t	20.7000	97.50	1
Koks	Coke oven coke	GJ/t	29.3100	107.00	1
Prirodni plin	Natural Gas	GJ/10 ³ m ³	35.3000	56.10	1
Gradski plin	Gas Works Gas	GJ/t	38.7000	44.40	1
Koksni plin	Coke Oven Gas	GJ/t	38.7000	44.40	1
Rafinerijski plin	Refinery Gas	GJ/t	42.6000	57.60	1

Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2022

SO_x

EMISSION CATEGORIES	Emissions for pollutant X reported in greenhouse gas (GHG inventory) (in kt) ⁽³⁾	Emissions for pollutant X reported under Directive 2016/2284 (NEC), submission version X (in kt) ⁽³⁾	Absolute difference in kt ^{(1) (3)}	Explanations for differences
National total (excluding LULUCF)	5	5	0.0	
1. Energy	5	5	0.0	
A. Fuel combustion (sectoral approach)	4	4	0.0	
1. Energy industries	2	2	0.0	
2. Manufacturing industries and construction	1	1	0.0	
3. Transport	0	0	0.0	
4. Other sectors	1	1	0.0	
5. Other	NO	NO	#VALUE!	
B. Fugitive emissions from fuels	2	2	0.0	
1. Solid fuels	NO	NO	#VALUE!	
2. Oil and natural gas and other emissions from energy production	2	2	0.0	
2. Industrial processes and product use	0	0	0.0	
A. Mineral industry	NO,NA	NO,NA	#VALUE!	
B. Chemical industry	NO,NE	NO,NE	#VALUE!	
C. Metal industry	0	0	0.0	
D. Non-energy products from fuels and solvent use	NE,NA	NE,NA	#VALUE!	
G. Other product manufacture and use	NO	NO	#VALUE!	
H. Other	NE,NA	NE,NA	#VALUE!	
3. Agriculture	NA	NA	#VALUE!	
B. Manure management	NA	NA	#VALUE!	
D. Agricultural soils	NA	NA	#VALUE!	
F. Field burning of agricultural residues	NA	NA	#VALUE!	
J. Other	NA	NA	#VALUE!	
5. Waste	0	0	0.0	
A. Solid waste disposal	NA	NA	#VALUE!	
B. Biological treatment of solid waste	NA	NA	#VALUE!	
C. Incineration and open burning of waste	0	0	0.0	
D. Wastewater treatment and discharge	NA	NA	#VALUE!	
E. Other	NO		#VALUE!	
6. Other	NA	NA	#VALUE!	

NO_x

EMISSION CATEGORIES	Emissions for pollutant X reported in greenhouse gas (GHG inventory) (in kt) ⁽³⁾	Emissions for pollutant X reported under Directive 2016/2284 (NEC), submission version X (in kt) ⁽³⁾	Absolute difference in kt ^{(1) (3)}	Explanations for differences
National total (excluding LULUCF)	42	42	-0.2	
1. Energy	42	42	-0.2	
A. Fuel combustion (sectoral approach)	41	42	-0.2	
1. Energy industries	5	5	0.0	
2. Manufacturing industries and construction	5	5	0.0	
3. Transport	24	24	-0.2	Difference is due to differences in methodology in Aviation sector
4. Other sectors	7	7	0.0	
5. Other	NO	NO	#VALUE!	
B. Fugitive emissions from fuels	0	0	0.0	
1. Solid fuels	NO	NO	#VALUE!	
2. Oil and natural gas and other emissions from energy production	0	0	0.0	
2. Industrial processes and product use	0	0	0.0	
A. Mineral industry	NO,NA	NO,NA	#VALUE!	
B. Chemical industry	NO,NE	NO,NE	#VALUE!	
C. Metal industry	0	0	0.0	
D. Non-energy products from fuels and solvent use	NE,NA	NE,NA	#VALUE!	
G. Other product manufacture and use	NO	NO	#VALUE!	
H. Other	NE,NA	NE,NA	#VALUE!	
3. Agriculture	3	4	-0.3	
B. Manure management	NA	0	#VALUE!	Difference is due to differences in methodology
D. Agricultural soils	3	4	-0.2	Difference is due to differences in methodology
F. Field burning of agricultural residues	NA	NA	#VALUE!	
J. Other	NA	NA	#VALUE!	
5. Waste	0	0	0.0	
A. Solid waste disposal	NA	NA	#VALUE!	
B. Biological treatment of solid waste	NA	NA	#VALUE!	
C. Incineration and open burning of waste	0	0	0.0	
D. Wastewater treatment and discharge	NA	NA	#VALUE!	
E. Other	NO	NO	#VALUE!	
6. Other	NA	NA	#VALUE!	

CO

EMISSION CATEGORIES	Emissions for pollutant X reported in greenhouse gas (GHG inventory) (in kt) ⁽³⁾	Emissions for pollutant X reported under Directive 2016/2284 (NEC), submission version X (in kt) ⁽³⁾	Absolute difference in kt ^{(1) (3)}	Explanations for differences
National total (excluding LULUCF)	206	206	-0.1	
1. Energy	204	204	-0.3	
A. Fuel combustion (sectoral approach)	190	190	-0.3	
1. Energy industries	2	2	0.0	
2. Manufacturing industries and construction	9	9	0.0	
3. Transport	22	22	-0.3	Difference is due to differences in methodology in Aviation sector
4. Other sectors	157	157	0.0	
5. Other	NO	NO	#VALUE!	
B. Fugitive emissions from fuels	14	14	0.0	
1. Solid fuels	NO	NO	#VALUE!	
2. Oil and natural gas and other emissions from energy production	14	14	0.0	
2. Industrial processes and product use	0	0	0.0	
A. Mineral industry	NO,NA	NO,NA	#VALUE!	
B. Chemical industry	NO,NE	NO,NE	#VALUE!	
C. Metal industry	0	0	0.0	
D. Non-energy products from fuels and solvent use	NE,NA	NE,NA	#VALUE!	
G. Other product manufacture and use	NO	NO	#VALUE!	
H. Other	NE,NA	NE,NA	#VALUE!	
3. Agriculture	3	0	3.4	
B. Manure management	NA	0	#VALUE!	
D. Agricultural soils	3	0	3.4	
F. Field burning of agricultural residues	NA	NA	#VALUE!	
J. Other	NA	NA	#VALUE!	
5. Waste	2	2	0.2	
A. Solid waste disposal	NA	NA	#VALUE!	
B. Biological treatment of solid waste	NA	NA	#VALUE!	
C. Incineration and open burning of waste	2	2	0.2	Difference is due to differences in methodology in Aviation sector
D. Wastewater treatment and discharge	NA	NA	#VALUE!	
E. Other	NO	0	#VALUE!	
6. Other	NA	NA	#VALUE!	

NMVOC

EMISSION CATEGORIES	Emissions for pollutant X reported in greenhouse gas (GHG inventory) (in kt) ⁽³⁾	Emissions for pollutant X reported under Directive 2016/2284 (NEC), submission version X (in kt) ⁽³⁾	Absolute difference in kt ^{(1) (3)}	Explanations for differences
National total (excluding LULUCF)	26	29	-2.2	
1. Energy	26	27	-1.5	
A. Fuel combustion (sectoral approach)	24	25	-1.4	
1. Energy industries	1	1	0.0	
2. Manufacturing industries and construction	1	1	0.0	
3. Transport	3	5	-1.4	Difference is due to differences in methodology in Aviation sector
4. Other sectors	19	19	0.0	
5. Other	NO	NO	#VALUE!	
B. Fugitive emissions from fuels	2	2	-0.1	
1. Solid fuels	NO	NO	#VALUE!	
2. Oil and natural gas and other emissions from energy production	2	2	-0.1	
2. Industrial processes and product use	0	0	0.0	
A. Mineral industry	NO,NA	NE,NA	#VALUE!	
B. Chemical industry	NO,NE	NO	#VALUE!	
C. Metal industry	0	0	0.3	
D. Non-energy products from fuels and solvent use	NE,NA	NE,NA	#VALUE!	
G. Other product manufacture and use	NO	NO	#VALUE!	
H. Other	NE,NA	NE,NA	#VALUE!	
3. Agriculture	9	8	0.5	
B. Manure management	7	7	0.5	
D. Agricultural soils	2	2	0.0	
F. Field burning of agricultural residues	NA	NA	#VALUE!	
J. Other	NA	NA	#VALUE!	
5. Waste	1	1	-0.7	
A. Solid waste disposal	1	1	-0.7	Difference is due to differences in methodology
B. Biological treatment of solid waste	NA	NA	#VALUE!	
C. Incineration and open burning of waste	0	0	0.0	
D. Wastewater treatment and discharge	0	0	0.0	
E. Other	NO	NO	#VALUE!	
6. Other	NA	NA	#VALUE!	

Annex 5-5: Reporting on consistency of reported emissions with data from the
ETS

Reporting on consistency of reported emissions with data from EU Emissions Trading System pursuant to Article 14				
Allocation of verified emissions reported by installations and operators under Directive 2003/87/EC to source categories of the national greenhouse gas inventory				
Member State: Croatia				
Reporting year: 2022				
Basis for data: verified ETS emissions and greenhouse gas emissions as reported in inventory submission for the year X-2				
	Total emissions (CO ₂ eq)			Comment ⁽²⁾
	Greenhouse gas inventory emissions [kt CO ₂ eq] ⁽³⁾	Verified emissions under Directive 2003/87/EC [kt CO ₂ eq] (3)	Ratio in % (Verified emissions/inventory emissions) ⁽³⁾	
Greenhouse gas emissions (for GHG inventory: total GHG emissions, including indirect CO₂ emissions if reported, without LULUCF, and excluding emissions from domestic aviation; for Directive 2003/87/EC: GHG emissions from stationary installations under Article 2(1) of Directive 2003/87/EC)	24,526.00	6,455.40	26.32%	
CO₂ emissions (for GHG inventory: total CO₂ emissions, including indirect CO₂ emissions if reported, without LULUCF, and excluding CO₂ emissions from domestic aviation; for Directive 2003/87/EC: CO₂ emissions from stationary installations under Article 2(1) of Directive 2003/87/EC)	17,777.24	6,443.19	36.24%	
CO ₂ emissions				
	Greenhouse gas inventory emissions [kt] ⁽³⁾	Verified emissions under Directive 2003/87/EC [kt] (3)	Ratio in % (Verified emissions/inventory emissions) ⁽³⁾	Comment ⁽²⁾
1.A Fuel combustion activities, total	6,731.87	NA	NA	
1.A Fuel combustion activities, stationary combustion	6,375.77	5,104.30	80.06%	
1.A.1 Energy industries	4,062.71	3,813.26	93.86%	
1.A.1.a Public electricity and heat production	3,060.92	2,989.21	97.66%	
1.A.1.b Petroleum refining	695.24	698.53	100.47%	
1.A.1.c Manufacture of solid fuels and other energy industries	306.56	125.51	40.94%	
Iron and steel (for GHG inventory combined CRT categories 1.A.2.a + 2.C.1 + 1.A.1.c and other relevant CRT categories that include emissions from iron and steel (e.g. 1A1a, 1B1) ⁽⁴⁾)	383.80	150.55	39.23%	
1.A.2 Manufacturing industries and construction	2,313.06	1,291.04	55.82%	
1.A.2.a Iron and steel	63.85	11.65	18.25%	
1.A.2.b Non-ferrous metals	30.87	14.56	47.18%	
1.A.2.c Chemicals	72.46	0.00	0.00%	
1.A.2.d Pulp, paper and print	118.16	109.84	92.96%	
1.A.2.e Food processing, beverages and tobacco	314.55	94.65	30.09%	
1.A.2.f Non-metallic minerals	1,313.42	1,022.64	77.86%	Inventory emissions from Construction sector are calculated
1.A.2.g Other	399.76	37.69	9.43%	Construction sector are calculated
1.A.3 Transport	6,667.33	NO	NO	
1.A.3.e Other transportation (pipeline transport)	NO	NO	NO	
1.A.4 Other sectors	2,722.45	NO	NO	
1.A.4.a Commercial/institutional	563.05	NO	NO	
1.A.4.b Agriculture/Forestry/Fisheries	1,466.22	NO	NO	
1.B Fugitive emissions from Fuels	356.09	NO	NO	
1.C CO₂ Transport and storage	NO	NO	NO	
1.C.1 Transport of CO ₂	NO	NO	NO	
1.C.2 Injection and storage	NO	NO	NO	
1.C.3 Other	NO	NO	NO	
2.A Mineral products	1,255.47	1,255.49	100.00%	
2.A.1 Cement production	1,099.08	1,099.08	100.00%	
2.A.2 Lime production	111.29	111.29	100.00%	
2.A.3 Glass production	30.43	30.43	100.00%	
2.A.4 Other process uses of carbonates	14.67	14.69	100.10%	
2.B Chemical industry	83.90	70.01	83.44%	
2.B.1 Ammonia production	83.90	70.01	83.44%	
2.B.3 Adipic acid production (CO ₂)	NO	NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	NO	NO	NO	
2.B.5 Carbide production	NO	NO	NO	
2.B.6 Titanium dioxide production	NO	NO	NO	
2.B.7 Soda ash production	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	NO	NO	NO	
2.C Metal production	13.39	13.39	99.98%	
2.C.1 Iron and steel production	13.39	13.39	99.98%	
2.C.2 Ferroalloys production	NO	NO	NO	
2.C.3 Aluminium production	NO	NO	NO	
2.C.4 Magnesium production	NO	NO	NO	
2.C.5 Lead production	NO	NO	NO	
2.C.6 Zinc production	NO	NO	NO	
2.C.7 Other metal production	NO	NO	NO	
N ₂ O emissions				
	Greenhouse gas inventory emissions [kt CO ₂ eq] ⁽³⁾	Verified emissions under Directive 2003/87/EC [kt CO ₂ eq] (3)	Ratio in % (Verified emissions/inventory emissions) ⁽³⁾	Comment ⁽²⁾
2.B.2 Nitric acid production	13.74	12.22	88.93%	
2.B.3 Adipic acid production	NO	NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	NO	NO	NO	
PFC emissions				
	Greenhouse gas inventory emissions [kt CO ₂ eq] ⁽³⁾	Verified emissions under Directive 2003/87/EC [kt CO ₂ eq] (3)	Ratio in % (Verified emissions/inventory emissions) ⁽³⁾	Comment ⁽²⁾
2.C.3 Aluminium production	NO	NO	NO	

Annex 5-7: Reporting information according to the decision 3/CMP.11

Background information on supplementary information required under Article 7, Paragraph 1 of the Kyoto Protocol

MESD, as the UNFCCC focal point, initiated intensive and continuous consultation and knowledge sharing with relevant national institutions responsible for the forestry sector in Croatia. The overall goal of this effort was to establish procedural arrangements necessary for streamlined data flow needed for reporting of information related to accounting of LULUCF activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol.

In Croatia, there is a long tradition of forest management and a comprehensive national system for monitoring, data collection and reporting on the condition and activities in the forestry sector. In that respect, the main effort was directed in the harmonization of current system with the KP-LULUCF requirements. In the beginning of 2010, MESD commissioned a preparation of Action plan for implementation of Article 3, paragraphs 3 and 4 of the Kyoto Protocol which should facilitate the process of data collection and preparation of information related to accounting of LULUCF activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol. Terms of reference for this Action plan included harmonization of definitions and their appliance to national circumstances, identification of lands subject to activities under Article 3.3 and elected activity under Article 3.4, data collection for estimation of carbon stock change and non-CO₂ greenhouse gas emissions and uncertainty assessment and verification.

The Ministry of Agriculture and MESD agreed that preparation of the annual GHG Inventory in respect of the LULUCF sector should be based on forest management plans. As for the first Croatian National Forest Inventory (CRONFI), it is still not official. Once CRONFI becomes official and published, it could be used to fill the gaps in reporting.

Information on changes in national registry

Croatian part of Union Registry is operational and it is a part of the Consolidated System of European Registries (CSEUR) operated by the European Commission since 01.01.2013.

It is accessible through the Internet page

<https://unionregistry.ec.europa.eu/euregistry/HR/index.xhtml>.

The following changes to the national registry of Croatia have occurred in 2023.

Reporting Item	Description
15/CMP.1 annex II.E paragraph 32.(a) Change of name or contact	No change of name or contact occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(b) Change regarding cooperation arrangement	No change of cooperation arrangement occurred during the reported period.

Reporting Item	Description
<p>15/CMP.1 annex II.E paragraph 32.(c) Change to database structure or the capacity of national registry</p>	<p>There have been five new EUCR releases in production (versions 13.10, 13.10.2, 13.10.3, 13.10.4 and 13.11.2) after version 13.8.2 (the production version at the time of the last Chapter 14 submission).</p> <p>No changes were applied to the database, whose model is provided in Annex A. No change was required to the application backup plan or to the disaster recovery plan.</p> <p>No change to the capacity of the national registry occurred during the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(d) Change regarding conformance to technical standards</p>	<p>The changes that have been introduced with versions 13.10, 13.10.2, 13.10.3, 13.10.4 and 13.11.2 compared with version 13.8.2 of the national registry are presented in Annex B.</p> <p>It is to be noted that each release of the registry is subject to both regression testing and tests related to new functionality. These tests also include thorough testing against the DES and are carried out prior to the relevant major release of the version to Production (see Annex B).</p> <p>No other change in the registry's conformance to the technical standards occurred for the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(e) Change to discrepancies procedures</p>	<p>No change of discrepancies procedures occurred during the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(f) Change regarding security</p>	<p>No changes regarding security were introduced.</p>
<p>15/CMP.1 annex II.E paragraph 32.(g) Change to list of publicly available information</p>	<p>No change to the list of publicly available information occurred during the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(h) Change of Internet address</p>	<p>No change to the registry internet address during the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(i) Change regarding data integrity measures</p>	<p>No change of data integrity measures occurred during the reported period.</p>
<p>15/CMP.1 annex II.E paragraph 32.(j) Change regarding test results</p>	<p>No change during the reported period.</p>

Reporting Item	Description
1/CMP.8 paragraph 23 PPSR account	Previous period surplus reserve (PPSR) account has been established in the Consolidated System of European Registries (CSEUR) in year 2022. No change occurred during the reported period.

The Annexes A and B are submitted together with this report. They are considered as confidential and are available upon request.

Changes in the national system

Changes to institutional, legal and procedural arrangements (24/CP.19, 22. (a))

There have been no changes since the last submission.

Changes in staff and capacity (24/CP.19, 22. (b))

Authorised Institution for preparation of 2023 inventory submission stayed the same securing the long-term experience built up over the past years.

Changes to national entity with overall responsibility for the inventory (24/CP.19, 22. (c))

There have been no changes since the last submission.

Changes to the process of inventory planning (24/CP.19, 22.(d,e)/23./24.):

There have been no changes since the last submission.

Changes to the process of inventory preparation (24/CP.19, 25./26.):

There have been no changes since the last submission.

Changes to the process of inventory management (24/CP.19, 27.):

There have been no changes since the last submission.

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